AMERICAN BUILDER
THE WORLD'S GREATEST BUILDING PAPER
APRIL 1952 TWO DOLLARS

BUILDER-DEALER Catalog
Directory FOR THE Light Construction Industry
behind the glistening finish—

precision manufactured security

**Kwikset**

Kwikset sales and service co.

Anaheim, California
INSIDE and OUTSIDE

YOU SAVE BUILDING TIME AND LABOR WITH

Fenestra READY-TRIMMED WINDOW UNITS

Sash, frame, hardware, inside trim, outside trim—all in one modern unit that comes to the site completely assembled for easy handling, quick trouble-free installation! Now all standard sizes of popular Fenestra Residence Steel Casements are available in this new time and money-saving package.

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Fenestra Steel Casement Units are weather-tight. The windows are graceful and beautiful. They always open easily. They are washed, screened, and storm-sashed from the warm, comfortable inside of the house. And they are available Super Hot-Dip Galvanized and Bonderized (on special order), so they never need maintenance painting. Call your Fenestra Representative today. Or write Detroit Steel Products Company, Dept. AB-4, 2268 E. Grand Blvd., Detroit 11, Michigan.

Fenestra READY-TRIMMED STEEL WINDOW UNITS
A complete package • Sash • Frame • Hardware • Inside Trim • Outside Trim
Take it from this SUCCESSFUL builder!

You can choose refrigerators wisely in One word — KELVINATOR!

Care in planning, building and investing has helped make Norman K. Winston outstandingly successful. His projects are well known throughout the country. He chooses Kelvinator refrigerators regularly. He says:

“Our satisfactory experience with Kelvinator covers 15 years and the purchase of over 5,000 individual Kelvinator refrigerators. We chose Kelvinator again for the 1122 apartments in the new Northridge project because they are attractive, they please tenants and rarely require attention.”

New, Giant Northridge Project in Jackson Heights, N. Y. — 1122 Kelvinators!
Brand-new apartments on brand-new terms of complete tenant ownership and management! And people came, saw and bought over 1,100 apartments in the first ten days! Another N. K. Winston-Muss Co. achievement!

Get Kelvinator benefits for your projects. Get detailed information by writing to Dept. AB-4, Kelvinator, Division of Nash-Kelvinator Corporation, Detroit 32, Michigan.

THERE IS A BETTER REFRIGERATOR FOR BUILDERS...

IT'S Kelvinator

REFRIGERATORS, RANGES, HOME FREEZERS, WATER HEATERS, AIR DRIERS . . . Electric, of course!
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The HASKO "MOBILE" FLUSH DOOR
with a "FLEX CORE"

...has a simple, sound assembly for maximum strength and durability yet is made to meet the price market.

This adaptation of the hollow-core principle meets the demand for high quality and low cost. This is another engineering achievement by HASKO for the builder who needs better flush doors. It is truly an economy door of outstanding quality.

**LOW COST** The HASKO "MOBILE" FLUSH DOOR is priced competitively, and is made and backed by a responsible manufacturer.

**QUALITY GUARANTEED** The HASKO "MOBILE" FLUSH DOOR carries the same guarantee and responsibility as the famous Hasko Arch-Kor Flush Door. It features "balanced" construction, and the warp-resistant, sound deadening and proper ventilation characteristics engineered into all Hasko Flush Doors. Its frame is constructed of selected kiln dried lumber and allows a generous amount of stock for trimming, plus sturdy 3/16" thick face panels.

**8-WAY HANGING SPEEDS INSTALLATION** Large 3 x 25 (5 x 25 including frame) double lock-blocks provide for fast, easy 8-way hanging of the HASKO "MOBILE" FLUSH DOOR.

**FLEX-CORE INCREASES LIFE, ASSURES PERMANENT BEAUTY**
The entire core construction provides complete support of the sturdy (3/16" thick) face panels. An additional feature of the door is in the use of the "Flex Core" core ribs. These provide a resiliency and flexibility that give the face panels an unusually high degree of resistance to denting from heavy impacts, or damage from warping, and assure great durability.

**TESTED** Thorough tests prove durability. The HASKO "MOBILE" FLUSH DOOR has withstood kiln tests of as high as 48 hours at 170 degrees. The Hasko name means sound construction, high quality, expert design and craftsmanship.

WRITE today for the special HASKO "MOBILE" FLUSH DOOR Bulletin. Orders will be filled in the sequence in which they are received.

HASKO

HASKELITE MANUFACTURING CORPORATION
Grand Rapids 2, Michigan

AMERICAN BUILDER
THAT CHANGES
ORDINARY INTO

Westinghouse Appliances Mean Extra Value to Home Seekers

No builder in his right mind would include appliances in the houses he builds unless they attract more prospects... make houses easier to sell... reflect the quality of his houses. And that is just what appliances do!

We have just completed a country-wide survey of purchasers of Westinghouse-equipped homes. The results bear out the wisdom of equipping houses with Westinghouse Appliances. They prove conclusively that the appliances were a dominant reason for buying these homes. They reveal what appliances people want and how they want them financed.

We believe the information will be valuable to you. Send the coupon below, we'll rush a copy to you.

... of course, it's electric!

Westinghouse Electric Corporation
Electric Appliance Division
Mansfield, Ohio

Please send me a copy of your booklet “Do Appliances Help House Sales?”

Name:

Street:

City State

A FULL LINE OF ELECTRIC APPLIANCES, MODELS AND SIZES

YOU CAN BE SURE... IF IT'S Westinghouse

APRIL 1952
Even the Lowest-Priced Houses Can Afford These Three NuTone Products

Let the NuTone Package make your low cost houses MORE ATTRACTIVE, MORE COMFORTABLE and MORE SALEABLE!

For only $84.95 or less (at list prices) ... the NuTone Package gives you the “edge” over competition ... because the NuTone Package “dresses up” your homes ... with ALL 3 NUTONE PRODUCTS ... A NuTone Ventilating Fan, to eliminate kitchen grease and cooking fumes ... a NuTone Door Chime for a friendly musical greeting at the front door ... and a NuTone Heat-A-Lite, the revolutionary new Electric Ceiling Heater and Light, to make bathrooms “toasty warm.”

NUTONE, INC., Dept. AB-6, Cincinnati 27, Ohio.
WHOSE LOW-COST HOUSES WILL THEY BUY?

THE ANSWER IS . . . THEY'LL BUY YOUR HOUSES WITH NuTone's *$84.95 OR LESS AT LIST Package

* The NuTone package includes Model 800 NuTone Ventilating Fan at $27.75 list (or Model 830 NuTone Ventilating Fan at $26.50 list); a NuTone model K-16 Door Chime at $7.25 list; and a NuTone Heat-A-Lite Model 900, at $49.95 list — ALL INDIVIDUALLY PACKAGED.

NUTONE, INC., Dept. AB-6, Cincinnati 27, Ohio.

NUTONE HELPS YOU SELL YOUR HOMES FASTER

Turn the low cost housing market into YOUR MARKET . . . with the NuTone $84.95* package. Write today for complete details about this plan, including free literature, diagrams, specifications and data for installing NuTone Ventilating Fans, Door Chimes and Electric Ceiling Heaters.

Name ___________________________ Position Held ___________________________
Firm ___________________________ Address ________________________________
City ___________________________ Zone ______ State ________
WIDER HEAT RANGE
in 5 New Furnaces
added to COLEMAN Blend-Air

HEATING AND VENTILATING SYSTEM

GAS

3 NEW MODELS
(Natural, Mid., Mixed, LP-Gas)
75,000, 100,000 and 125,000 BTU input

Factory-assembled complete with rugged combustion chamber, burner, blower-motor unit, inner casing—all enclosed in beautifully styled cabinet. Internal wiring ready to connect to thermostat and house service. Controls factory-installed, conveniently located in vestibule compartment. Unusually compact for models of this capacity, assuring outstanding performance to suit every home. Approved by American Gas Association.

1. MAGIC BLENDER
in each room blends room air with freshly heated furnace air right in the wall, then RE-circulates for even warmth.

2. 3¼-INCHE HEAT TUBES
carry freshly heated air to Blenders. Small enough to fit any construction, old or new.

3. BLEND-AIR FURNACE
with fresh air intake uses up as little as 6 sq. ft. of floor space anywhere—basement, closet, utility room.

These 5 new Coleman Forced Air Furnaces now make it possible to equip more homes with the revolutionary, low-cost Blend-Air Heating and Ventilating System. Users everywhere praise its low-cost performance and evenly distributed automatic comfort—it’s the kind of heating performance customers are willing to buy—makes homes easier to sell. Send coupon for complete information. The Coleman Company, Inc., Wichita 1, Kansas.

THE COLEMAN COMPANY, INC.
Dept. AB-752, Wichita 1, Kansas

Please send complete information on Coleman Blend-Air.

Name:

Street:

City:

State:

AMERICAN BUILDER
Experience is proving that when the “Better Half” of the home-buying couple spots Micarta-topped surfaces in kitchens and bathrooms, she quickly jumps to the salesman’s side.

There’s a reason. She knows from national advertising on Television and in Better Homes & Gardens that Micarta’s® tough, super-smooth surface requires just a swish of a damp cloth to keep it sparkling clean. In her mind’s eye, she has matched Micarta’s full-range of decorator colors with her own personal color scheme.

The “Other Half” wants his money’s worth... and so do you. Tell him Micarta will last a lifetime, never needs to be replaced. Your “money’s worth” comes in the form of Micarta pre-bonded to plywood for easier, faster installation by any good carpenter.

Add the “housewife appeal” of Micarta to your own savings in time and labor, and you’ll agree with other builders that Micarta is a “smart, effective salesman”.

United States Plywood Corporation
55 West 44th Street, New York 18, N.Y.
Please send Micarta Booklet—Form No. 1118.

Name ____________________________
Address __________________________
City _______ Zone _______ State ______

April 1952
Specify prefinished Bruce Strip Floors to give owners more value for less money.

The factory-applied finish brings out all the natural beauty of the wood . . . doesn't cover up or discolor the grain. Tests have proved it will outwear surface finishes at least 3 to 1. And housewives find their prefinished Bruce Hardwood Floors far easier to keep clean and beautiful.

The cost of this modern hardwood flooring is usually less than the same grade of unfinished flooring plus the expense of on-the-job finishing. There's a saving of 3 to 5 days' time on every house because there's no sanding and finishing, no holding up the work of other trades. Write for complete information on prefinished Bruce Strip Floors. See our section in Sweet's File.
A New American Builder Service

This issue of American Builder is the first complete catalog and reference data book ever prepared for the entire light construction industry. Its function is twofold. First, it contains a directory of building products arranged alphabetically, and with supplementary listings and other information to facilitate use. Second, it contains a wealth of reference data material on the use of most building products. It is in every sense a "Where to get it—How to use it" book.

Supplementing the alphabetical listing of products are several others. One is an alphabetical listing of brand names identified with the producers who use those names. Second, is an alphabetical list of producers. Finally, there is a list of trade associations, also arranged alphabetically. Thus, a reader interested in a given product, can turn to the products list, and find the names of the manufacturers who produce the product. If the reader knows only a brand name he can turn to the brand name listing, and immediately determine the name of the manufacturer of products under that brand name. The listing of manufacturers permits the reader to instantly find an address. Finally, the association listing is included to enable the reader to get information of a general nature on any given class of products. Manufacturers whose products are advertised in American Builder appear in bold type. The purpose of this emphasis is to enable the reader to comb through his library of American Builder issues for the specific information contained in the advertising of a given manufacturer or group of manufacturers.

The main editorial section of the book is the reference data section. This is divided into chapters with the contents of each clearly noted. Advertising, with the exception of a few pages that were not classifiable or came in too late to be classified is included in the chapter which treats the product or products advertised.

This association of advertising with the reference data saves time for the reader and directs him quickly to an invaluable source of useful editorial and advertising information on any given product. To accomplish this type of make-up it was necessary to solve many unprecedented production and printing problems. It was possible only through excellent cooperation on the part of advertisers and advertising agencies, and perfect liaison between our business and editorial staffs.

The magnitude of the job that faced the publishers probably can be appreciated when it is known that approximately 5,775,000 separate impressions in the printing shop were necessary to produce the issue. The publishers are proud of this latest first in a long line of American Builder firsts, and in commending our own editorial and business personnel together with advertisers and advertising agencies, view this trail-blazing issue as another indication of American Builder's continuing leadership in the light construction industry.
THOSE NEW CONSTRUCTION REGULATIONS, pending since the first of the year, have been issued by NPA. Order M-100 applies to that "separate breed" — the home builders. Another regulation, Revised CMP Reg. 6, covers other construction. Both orders became effective March 6.

ORDER M-100, the housing regulation, covers construction or alteration of housing up to four-unit size, except Wherry-Act housing. Larger multi-unit structures are under CMP Reg. 6.

THE NEW ORDERS ARE Milder than old regulations. There are substantial relaxations on the use of steel. The only curtailment of importance is a reduction (by 25 pounds) in the amount of copper permitted for houses with copper water distribution systems. Mixed water service systems are permitted, as noted below.

SELF-AUTHORIZATION REMAINS in effect. Home builders can self-certify orders for CMP materials, the same as under former regulations. NPA dropped plans for imposing new limitations on housing, like square-footage or a bath-and-a-half per unit.

M-100 SETS UP THE FOLLOWING self-certification allowances per unit on housing started after March 6:

- Structures using copper water distribution systems: 1,850 pounds of steel, 35 pounds of copper.
- Structures using copper water distribution systems: 1,950 pounds of steel, 135 pounds of copper.
- Where a local building code requires type B or K copper tubing for underground water service connections, but steel pipe is used inside: 2,135 pounds of steel, 80 pounds of copper. If copper pipe is used inside: 1,950 pounds of steel, 145 pounds of copper.

ANOTHER PROVISION of M-100 permits self-certification of up to 50 per cent of the above amounts for alterations. But a home must be at least a year old before this can be done.

IF ALTERATION of an existing structure includes initial electrical wiring, an added 17.5 pounds of copper per unit can be self-certified. Similarly, additional materials can be self-authorized to cover initial plumbing installation. New units using electrical energy heating systems get a bonus of 15 extra pounds of copper.

ONE BIG CHANGE from previous regulations: Builders may substitute aluminum for copper in electrical wiring systems. One pound of aluminum for two pounds of copper. If aluminum wiring is used, the copper allotment per unit must be reduced accordingly.

NO ALUMINUM can be self-certified, except for wiring. Likewise, no structural or stainless steel is permitted in new home construction. There are several specific prohibitions, also, on the use of copper fabricated on the job site. Examples: Downspouts, gutters and accessories; linoleum stripping, roofing, and in cement or composition flooring.

A VIRTUAL BAN ON SEASONAL HOUSING is contained in M-100. This ban hits both new construction and alterations. After March 6 a builder can't self-certify for this type construction unless he first obtains an "exception" to the order — and NPA says it won't grant many. Only in cases of "undue hardship." But if construction or alteration of a "seasonal" house was already under way on March 6, a builder can use regular self-certification to go ahead and complete the job.

FOR TEMPORARY HOUSING, self-certification is out. A CMP-4C application must be filed and approved (by HHFA) on all such housing. Again, the rule does not apply if construction or alteration was already under way before March 6.
USE OF FOREIGN OR USED STEEL, including structural, is permitted under both M-100 and CMP reg. 6. It won't be charged against the self-certification quota in any case. Members of the construction industry advisory committee held out for this and won. But NPA warns that it won't match this "free" steel with added amounts of copper or aluminum.

BUILDERS CAN USE a "DO" rating to obtain materials and equipment other than basic controlled metals of steel, copper and aluminum. The allotment symbol for housing is "U-7."

CONSTRUCTION UNDER WAY when M-100 was issued will continue to be governed by regulations previously in effect. In some cases, this will mean a more liberal copper allotment. If a builder finds material benefits in the new order, NPA says he can switch over and use it. He can also use the new aluminum-wiring provision. But all housing started after March 6 has no choice. It is regulated entirely by the new rules.

ONE AIM OF M-100, according to NPA, is to bring materials out of inventory and get them charged against CMP. Under former regulations a builder could supplement his self-certifying quota by using from his own inventory. This is no longer permitted. Under the new rules, anything used from inventory must be considered a part of the per-unit quota, the same as though it were acquired from an outside source by self-certification.

REVISED CMP REG. 6 follows the new housing order in easing up on steel. A principal change from former regulations is the increase, from two to five tons, in the amount of carbon steel that can be self-authorized each quarter for a commercial, non-industrial project. But only two of the five tons can be structural. And no wide-flange beams at all.

LIBERAL RELAXATION for new commercial and industrial construction is indicated for last two quarters of '52. DPA is encouraging filing of all applications for processing now so work can start promptly. Any prolonged strike in the steel industry could reverse this outlook.

MORE PRE-COMMITMENT AUTHORITY for FNMA may be forthcoming to help builders meet defense housing needs. Industry spokesmen are pounding away on the theme that such authority is needed to help break the present mortgage bottleneck.

RESOLUTIONS were introduced in Congress March 13 to add $52,000,000 to FNMA's pre-commitment authority. This addition would cover more than 5,600 units in 37 specific critical areas. Applications for pre-commitment on this housing were made before FNMA'S authority expired last December 31; but the agency had used up all its $200,000,000 authorization before it got around to them.

DIRECT-LOANS-TO-VETERANS BILL passed the House, 341 to 0. It's now pending before a Senate committee. The bill would guarantee VA at least $25,000,000 a quarter for making direct home and farmhouse loans to veterans. It would add a total of $125,000,000 to the agency's "revolving fund."

HOUSE APPROPRIATIONS COMMITTEE, at work on the big 1953 budget, has recommended that Congress authorize construction of only 25,000 public housing units during the next fiscal year. The budget request was for 75,000.

THE HOUSE HAS WHITTLED large chunks off President Truman's recent request for more funds for defense housing activities of HHFA and FSA. Provision of community facilities and services is a joint HHFA-FSA responsibility under the Defense Housing Act, and $44,500,000 was requested for this work. The House, in passing the bill, approved only $13,375,000. In addition, President Truman asked $25,000,000 for public housing under HHFA. This was cut to $12,500,000.

FEBRUARY HOUSING STARTS were estimated at 77,000 by the Bureau of Labor Statistics. This compares with a January total of 68,000, and with 80,600 starts in February 1951. Private building alone accounted for approximately 74,500 of the starts in February 1952.

WAGE BOOSTS for construction workers may result from new policy just announced by the Wage Stabilization Board. The board said it would approve pay increases of up to 15 cents an hour in 1952. Nor will it oppose establishment of health and welfare plans for construction workers, provided employer contributions to such plans do not exceed 7 1/2 cents an hour.

APRIL 1952
HERE'S THE HOME BUILDING PICTURE ACROSS THE NATION

American Builder again presents its exclusive, nation-wide quarterly survey of current industry opinion on the most pertinent problems of the day and the outlook for the immediate future.

Last-minute telegraphic reports from leading active builders, reproduced here in capsule form, provide the most authentic and up-to-date information available. The adjoining map indicates the states represented in the regional summaries.

Consensus:
Out of the haze of varied opinions, there appears to be a definite feeling of quiet optimism, which was lacking in the January report. The newly enacted NPA M-100 regulation (discussed in detail in the American Builder Washington News Letter on pages 14 and 15) is expected to accelerate this favorable trend.

During the next six months, home starts may decline slightly—possibly 10 per cent—and building costs are not expected to change. Three months ago, estimates forecast an average drop of 20 per cent in starts and rise of 5 to 10 per cent in costs.

Sales resistance is increasingly apparent in moderate and high-cost homes, while the mortgage situation remains much the same as in January, with conventional loans readily available. FHA in fair supply and VA very tight.

Few difficulties are reported due to NPA poundage limitations; materials supply lines are improving and talk of labor shortage has all but vanished.

Home Starts in Next Six Months—Increase or Decrease?

Northeast
Reports generally cancel each other out, indicate little overall change in tempo, but represent improvement over forecast of last January. Central New York looks for an increase of 50 per cent, while New England centers expect general improvement, as much as 15 per cent in Boston and Hartford, Conn. Long Island expects to hold even while New Jersey centers vary from no change to a drop of 20 per cent. Philadelphia and Washington anticipate moderate decline.

Southeast
General decline forecast, excepting South Florida and Montgomery, Ala. Falling off of 40 per cent expected at Memphis and New Orleans.

Central
Iowa cities see 5 to 10 per cent more activity, except Davenport, which fears a 40 per cent drop. South Bend, Ind., expects a 15 per cent boost while the St. Louis situation will probably remain static. Other areas forecast a slight cut, averaging 10 to 15 per cent or about the same as predicted in January.

Southwest
Area-wide decline of 25 per cent freely predicted, but San Antonio, Texas, believes the drop will be limited to 10 per cent.

West
Denver anticipates activity will be equalled or slightly surpassed. Spokane, Wash., anticipates no change. Other cities list decreases, from 10 per cent in Los Angeles to 30 per cent in Tacoma, Wash.

Is Sales Resistance Increasing?
In What Price Brackets?

Northeast
Ready sales are the rule in lower-price ranges, with definite resistance beginning at $12,000 in Philadelphia; at $15,000 in Hartford, Conn., central New York and northern New Jersey; at $20,000 in Boston and at $35,000 in Essex and Morris Counties. N. J. Washington finds it hard to move homes requiring more than $5,000 cash.

Southeast
Jackson, Miss., alone reports no particular resistance. Other centers note fair to strong resistance in all ranges except South Florida, where the sales slowdown begins at $15,000 and Memphis, troubled mainly in the $17,000 to $20,000 bracket.

Central
Buyers becoming increasingly reticent in most areas, but Cincinnati and St. Paul, Minn., anticipate upward swing with arrival of spring. South Bend, Ind., experiencing difficulty in low-cost brackets. while Wisconsin, Illinois and Dayton, Ohio, note definite lack of sales over $15,000. Regulation X down payment requirements generally held responsible for slowdown.

Southwest
Increasing resistance evident throughout territory, with only San Antonio, Texas, considering situation as “not serious yet.” Market seen sluggish for homes priced at $15,000 and up.

West
Fair resistance laid to financing difficulties. Sales still brisk in $8,000 to $10,000 bracket at Denver, with slower market, but “no distress housing deals at present” above that range.
LONE STAR MASONRY MORTAR WINS CRAFTSMEN'S PRAISE ON ATTRACTIVE NEW LINCOLN HOTEL, ODESSA, TEXAS

- They know good cement in Odessa, Texas, as they do good cattle and oil. This great young city, supply center for an area with 25,000 producing oil wells, is building for the future... population trebled in a decade.

One fine new structure is fire-safe, 150-room Lincoln Hotel, another 'soup-to-nuts' Lone Star job: Footings, foundations, structural frame and floors concreted with LONE STAR PORTLAND CEMENT... eye-pleasing exterior walls laid up with LONE STAR MASONRY CEMENT.

"Mister, that's Mortar!" said the critical craftsmen who laid up the brick. Notice how it sticks to brick or block... stays plastic until units are firmly bedded... with extra water retention to keep brick from sucking water out of the mortar... higher bonding strength and watertightness... truly, the Masonry Cement that's 'got everything!"
Building Costs — What Changes May Come in the Next Six Months?

**Northeast**
Consensus indicates little or no change. Philadelphia, central New York and Delaware see a 5 per cent increase.

**Southeast**
Costs appear stabilized, with only Jacksonville, Fla., expecting an increase, 5 per cent. Slight decreases are predicted for South Florida and Birmingham, Ala.

**Central**
Slight rise in costs foreseen, with Sioux City, Iowa, topping the list at 5 to 10 per cent and Des Moines, Iowa, placing the figures at 5 to 8 per cent. Stable conditions are reported at Milwaukee, St. Louis, South Bend, Ind., and Davenport, Iowa, the latter explaining that lower cost of materials will offset the rising labor bill. If sales fall off, Cincinnati predicts a reduction in home prices as great as 10 per cent, with builders and suppliers cutting margins.

**Southwest**
Present levels likely to continue.

**West**
Opinion divided as to costs remaining the same or increasing. Rise of 10 per cent expected in Tacoma, Wash., while Denver rates it at 5 per cent. Los Angeles attributes an undetermined increase to labor conditions.

**What's the Mortgage Money Situation?**

**Northeast**
Availability of money for conventional, FHA and VA mortgages ranges from "good" in Boston to "very limited" in Washington, D.C. Philadelphia and Delaware have no VA money at all and in northern New Jersey only a small amount can be had upon payment of a premium. Conventional and FHA funds generally are in good supply, except for Philadelphia, where the FHA supply is tight.

**Southeast**
VA practically nil, although Birmingham, Ala., lists some loans available for houses priced above $10,000. FHA and conventional loans reported available, but not plentiful, in Jacksonville, Fla. FHA situation is critical in New Orleans and all type of mortgages are very short in South Florida. In most cases, conventional loans present no major problem.

**Central**
Scarcity of VA loans acute in all reporting centers, but recent improvement is noted in Davenport, Iowa, and Dayton, Ohio. Davenport reports FHA backing "reluctantly available," which seems to apply to South Bend, Ind., and Sioux City, Iowa. Conventional mortgages are in fair supply at 5 per cent interest, with top valuation about 60 per cent.

**Southwest**
No problems on completions, as yet. Essex and Morris County, N.J., builders of large homes find it impossible to build units with more than two baths.

**Southeast**
Memphis reports regulations limit home size to about 1,400 sq. ft. of floor area. No difficulties revealed.

**Central**
St. Paul, Minn., which encountered difficulty with copper allocation for water supply lines, finds new M-100 order solves its problem. St. Louis has no problem now but fears latest regulation may cause trouble. Des Moines, Iowa, reports serious restriction of the market for larger custom-built houses.

**Southwest**
No difficulties.

**West**
No problems, other than elimination of the luxury home.

**Are NPA Poundage Limitations On Metals Hindering Completions?**

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**West**
No problems, other than elimination of the luxury home.

**Is Labor Supply Adequate In All Trades?**

**Northeast**
Manpower situation reported plentiful everywhere, although Hartford, Conn., warns it is becoming increasingly hard to find competent help.

**Southeast**
Supply ranges from adequate to abundant in all reporting centers.

**Central**
No shortage listed anywhere but in western Illinois, which finds the carpenter situation tightening. A minor degree of unemployment is cropping up in St. Paul, Minn.

**Southwest**
Adequate supply everywhere.

**West**
Only Denver reports a problem — scarcity of bricklayers, lathers and plasterers.

**Are Materials in Adequate Supply?**

**Northeast**
Sufficient quantities of all materials generally noted, the only exceptions being a growing copper scarcity in New York's Chemung Valley area and a tight supply of galvanized sheets in Essex County, N.J.

**Southeast**
Copper, aluminum and steel all on the critical list at New Orleans, Birmingham, Ala., lacks copper. No other shortages reported.

**Central**
Sole shortage acknowledged at the moment is large-sized copper wire at Dayton, Ohio. Cincinnati anticipates a cement crisis in late summer.

**Southwest**
Copper is off approximately 15 per cent in northern Texas. All supplies adequate at other reporting centers.

**West**
No signs of shortage in evidence, excepting Denver which foresees a future tightening of copper.
Dant & Russell are manufacturers and general sales agents for a diversity of building materials—the finest of Pacific Coast woods...the best in building materials...important products for most construction needs. Your needs can be supplied from company-owned warehouses throughout America.
It really
when you use

**Nu-Calk**

**SPEED LOAD**

America's Favorite Calking Compound

Every calking job will be “top notch” when you use high quality Nu-Calk Speed Loads. Nu-Calk “stays put” — will not dry out, run, crack, harden or pull away. Speed Loads are easy to use, too! User’s hands never touch the compound. Always has a smooth, even flow, and easy trigger action. Try it yourself and you’ll see why Nu-Calk Speed Loads enjoy such nationwide popularity!

**Nu-Calk Calking Compound**

*IN CANS, TOO!*

The “standard of quality” in the calking field! Same fine product as in Speed Loads, but also available in ½-pint, pint, quart, gallon, 5-gallon cans. Also 55-gallon drums! Order a supply, today!

**CG-4 Speed Loaders**

Here’s the streamlined gun that goes with Nu-Calk Speed Loads. This SPEED LOADER calking gun is light, sturdy, fool-proof. Simply slip in a load and you’re ready to calk!

**CG-3 Standard Gun**

Experienced calking applicators still favor our CG-3 Standard Gun’s easy trigger action and powerful piston action. Fitted for use with Nu-Calk Speed Loads or bulk calking.

FOR FAST DELIVERY, ORDER NOW!
Your order will be shipped same day received!

- Full freight charges prepaid and allowed on orders of 100+ or more.
- Nu-Calk Speed Loads, Nu-Glaze and Nu-Pholt may be combined to make a 100+= shipment.
"Stays Put"
M-D Quality Products

Nu-Phalt PLASTIC ASPHALT CEMENT
For Sticking Down Asphalt Shingles and General Repair on Roofs and Flashings!

Comes in popular load form like M-D's famous SPEED LOAD for calking guns, or in 2½ lb., 10 lb., 50 lb., and 550 lb. containers.

NU-PHALT HAS DOZENS OF USES!

Stick down asphalt shingles or other roofing repair work. Perfect around gutters and valleys. Applicable to all roofing work. Apply around chimney flashings with calking gun or with putty knife. Handy for sticking down loose asphalt tile, and many other uses.

Use Nu-Glaze GLAZING COMPOUND instead of putty!

Nu-Glaze overcomes all the old bugs about putty because it "always stays put!" Never dries out, hardens, cracks or peels off!

Nu-Glaze is not a putty, but a plastic glazing compound that's perfect for glazing, filling cracks, setting plumbing, boatwork, etc. Comes in ½-pint, pint, quart, 5 lb. cans. Also available in drums – 25 lb., 50 lb., 100 lb., and 880 lbs. Order your Nu-Glaze today!

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ASSOCIATIONS
Their Plans and Activities

Dealer Meetings Draw Record Crowds
As Industry Eyes Effects of Curb

Keen interest in the status of the industry under current and potential government controls is pushing attendance to record levels at state and regional lumber dealer association conventions. Registration has hit the 4,000 mark at several meetings; highest reported so far is the new Northeastern record of 4,748.

The traditional annual "get-togethers" of around 30 of the allied groups began in January and will continue through April. Becoming increasingly popular, the conventions are also long on history— it was the 71st annual meeting for the Ohio association and many are in their 50's and 60's.

Here are some convention highlights:

NORTHEASTERN

The Defense Production Authority's announcement that critical materials would be 40 per cent less available for home construction in 1952 than in 1951 has been labeled as "utterly unrealistic" by the Northeastern Lumbermen's Association.

In a strongly worded resolution adopted at its recent record-breaking 58th annual convention in New York, the association charged that such a cutback would not create savings vitally affecting defense production, although it would probably provoke serious unemployment in the industry.

Held in the Hotel Statler, the sessions drew an all-time high registration of 4,748 persons, while 122 exhibitors occupied 163 booth spaces.

Frank H. Morin of Fulton, N. Y., was elected president to succeed Russell L. Fish of Scituate, Mass. Other new officers named were J. Harold Stacey, Windsor, Vt., first vice president; Dewo W. Johnson, Ellenville, N. Y., second vice president; Arthur Clifford, Bridgeport, Conn., third vice president; Jay LeFevre, New Paltz, N. Y., fourth vice president, and Oliver J. Veling, Buffalo, treasurer.

Other resolutions adopted urged the government to stop yielding to demands by specially favored pressure groups for wage increases; asked Congressmen to scrutinize carefully all requests for appropriations and eliminate all non-essential expenditures from the national budget; called for cutbacks in public housing starts comparable to those set for private enterprise; recommended that all proposed public projects be submitted to local referendum and demanded legislation requiring that all cooperatives "bear their fair share of the tax burden."

Frank H. Morin, Northeastern President

Steel Cabinet Producers
Form Trade Association

Final organizational plans were completed recently by the Steel Cabinet Manufacturers Association. Nineteen companies made up the original membership of the new group, with others considering affiliation.

Member companies at time of organization were:


Named president of the new association was M. M. Miller, president of Miller Metal Products Co. F. F. Duggan, general sales manager of American Central Division, Acvm Manufacturing Co., is vice president, and Arthur J. Tuscan, trade association management firm head, is executive secretary and treasurer.

Air Mortgage Problems at Senate Hearing

LAWMAKERS AND HOME BUILDERS meet at recent seminar called by Senate banking and currency committee to discuss mortgage finance problems in connection with stimulation of defense and military construction. From left: John M. Dickerman, National Association of Home Builders legislative counsel; Senator Burnet M. Maybank of South Carolina, committee chairman; Emanuel M. Spiegel, New Brunswick, N. J., NAHB first vice president; Alan E. Brockbank, Salt Lake City, NAHB president; and Senator John M. Sparkman of Alabama.
Dealer Meetings Draw
Record Attendance

(Continued from preceding page)

OHIO

A near-record attendance was reported at the 71st annual convention and materials exposition of the Ohio Association of Retail Lumber Dealers. Nearly 4,000 dealers, manufacturers and their guests were on hand for the recent meeting in the Cleveland public auditorium.

Product exhibits were more comprehensive this year, emphasizing growing competition, according to Findley M. Torrence, association secretary. Exhibits numbered 161.

More than 12 hours of panel discussions were conducted at top-management clinics during the three days of the convention. Topics included: more effective selling, better retailer-consumer relations, employee education, and improved merchandising policies.

An impressive display illustrating millwork design and shop management was staged by the Cleveland Lumber Trade School. Suggested by the Cleveland Lumber Institute, the school exhibit was a new convention feature.

James Clemens of the Selecto Lumber Co., Youngstown, was elected president of the group for 1952, succeeding William Stime of Bryan. Also named to new offices were Homer Prakel, Valparaiso, first vice president; and Ralph Lutz, Lexington, second vice president. Reelected were Allen Brain, treasurer; secretary Torrence; and Charles E. Benson, assistant secretary.

SOUTHWESTERN

A total registration of 4,250 at this year’s convention broke all previous records for the Southwestern Lumbermen’s Association. This was the 68th annual meeting of the group, made up of dealers from Missouri, Kansas, Arkansas and Oklahoma.

Business sessions were held at the Kansas City, Mo., municipal auditorium, where 177 exhibitors used 227 product display spaces.

The program reportedly met with greater enthusiasm than on any other recent occasion. The list of guest speakers included U. S. representative O. K. Armstrong of Springfield, Mo., Garner M. Lester, president, National Tax Exemption Association, Jackson, Miss.; Don A. Campbell, Lebanon, Ky., NRLDA past president; and Dr. Allen A. Stockdale, National Association of Manufacturers.

Association officers elected to serve in 1952 are: Henry H. Jones, Little Rock, Ark., president; Fred S. Stephenson, Chickasha, Okla., first vice president; Sam M. Arnold, Kirkville, Mo., second vice president; C. M. McAllister, Garden City, Kan., third vice president; C. Wilbur Baker, Kansas City, Mo., treasurer; Frank C. Tyler, Kansas City, Mo., counsel; and Allan T. Flint, Kansas City, Mo., secretary-manager.

1952 OFFICERS Of Southwestern Lumbermen’s Association: (from left) C. M. McAllister, third vice president; Fred S. Stephenson, first vice president; Henry H. Jones, president; Sam M. Arnold, second vice president; and Allan T. Flint, secretary-manager.

NORTHWESTERN

“We’ve had a lot of ‘specialty’ people enter the building field in the past few years and one of the reasons for this is that the retail dealer has been too busy to realize his obligation to the customer.” R. Clem Kuehnt, president of the Northwestern Lumbermen’s Association, told members of the group at its recent 62nd annual convention in Minneapolis.

Kuehnt, who was reelected to a second term as association head, opened the meeting with a talk on “Dealers’ Obligations.” Speaking of giving a complete and conscientious service to the customer, he declared: “If the dealer does not apply himself and do these things for the customer, someone else will and the dealer will not only lose that business, but some more with it.”

The lumber dealer, Kuehnt said, has an obligation not only to contribute financially to local agencies but to take an active part in community affairs by making it his business to see that the people who are running the various organizations are capable of doing so. He also urged greater interest and participation in government at the state and national levels.

Other convention speakers included Joseph T. King, association Washington counsel; Joseph L. Wood, assistant treasurer, John-Manville Corp.; Ralph W. Carney, vice president of the Coleman Co.; and James Q. du Pont, extension division, the du Pont Co.

The four state vice presidents of the association are Neil D. Woodworth, Little Falls, Minn.; Dean Piper, Minot, N.D.; George Westover, Pierre, S.D.; and Harold Weitz, Des Moines, Iowa.
WISCONSIN

More than 3,500 persons, the largest crowd in the group’s convention history, were on hand for the 62nd annual meeting of the Wisconsin Retail Lumbermen’s Association in the Milwaukee auditorium. Exhibit space was filled to capacity by 190 booths.

Talks by several nationally-recognized business experts featured the general sessions. These included “Taxes,” by Joseph F. Leopold, industrial relations counsel, Dallas, Texas; “Credits and Collections,” Harry L. Judd, U. S. Gypsum Co.; “Salesmanship,” Tom Collins, publicity director, City National Bank and Trust Co., Kansas City, Mo.; Donald DeWitt New Head of Maple Flooring Group

R. E. McConnell, Paris, was named vice president.

Directors named for two year terms, in addition to McConnell and Levy, are W. W. Henderson, Hopkinsville; Graham McCormick, Lexington; Claude Berry, Eminence; W. C. Hale, Hickman; Kenneth Lawson, Baxter; D. M. Daugherty, Falmouth; and Graham Montley, Bowling Green.

Launch One-Year Course At College Level for Lumber Yard Careerists

Opening of a trade school for retail lumber yard and counter personnel, to be operated in cooperation with Oklahoma A & M Tech School at Okmulgee, has been announced by the Oklahoma Lumbermen’s Association.

Plans reported by R. A. “Bob” Parker, president of OLA, and L. K. Covelle, A & M Tech director, call for two divisions of the school—a one-year course under the trade preparatory division for students with no experience in the retail lumber business; and, for those with experience, an eight-week program in the trade extension division, covering subjects the student needs most.

The one-year course requires 12 full months and covers the following curriculum:

Commercial—Business English, business letter writing, penmanship, typing, business machines, business law, insurance, lien laws, real estate, finance, collections, labor laws, merchandising, economics, business arithmetic, accounting, and stock control.

Light Construction—Cost estimating, carpentry, cabinet making, craftsmanship, free hand drawing, blueprint reading, building materials, wood, metal, glass, wallboard, millwork, paint, concrete, and interior decorating.

Human Relations—Personnel, customer courtesies, salesmanship, business ethics, and public speaking.

For the eight-week extension division course, the student may select any of the above courses. Enrollment starts each eight weeks during the year. The first period started March 3.

Courses were adapted by the association’s educational committee. Teachers for the academic courses will be supplied by the school, with OLA supplementing the instruction with lectures by men in the industry.

School director Covelle said it was the sponsors’ feeling that the program can render a worthwhile service to young men and women who want to enter the retail lumber industry and can afford only one year of college. In addition, it offers a refresher course to those already in the field.

The school is open to anyone with the ability to learn and desire to work. Covelle said. High school graduation is not a pre-requisite.

KENTUCKY

Elbert Myers of the Old Planing Mill, Glasgow, was elected president of the Kentucky Retail Lumber Dealers Association at the group’s recent annual meeting in the Brown Hotel, Louisville. He succeeds Sam Levy of Louisville.

INSPECTING FACILITIES of Oklahoma A. & M Tech School are (from left) Dale Carter, Tulsa, vice president of Oklahoma Lumbermen’s Association; L. K. Covelle, school president; and R. A. Parker, Ponca City, Okla., president.

140 More Dealers Get "Minute Men" Buttons

“Minute Man” lapel buttons in recognition of active participation in its new public relations campaign have been sent by the National Retail Lumber Dealers Association to 140 more dealers throughout the country.

In distributing the buttons, C. B. Sweet, chairman of the group’s public affairs committee, reported that more than 2,800 newspaper chippings were on file in the national’s public relations department.
Dealer's Viewpoint

H. R. NORTHUP, Executive Vice President,
National Retail Lumber Dealers Association

Political Struggle for Critical Materials Takes Clearer Shape

The extent to which politics influences the course of the defense controls program is shown as construction is concerned has become increasingly evident in recent weeks. It was generally assumed that political considerations would be given more and more weight with the approach of election day, but the pattern has developed even more clearly than had been anticipated.

If that pattern continues to develop—and there is no reason to think it will be held in check—light construction industry will have to remain continually alert to see that its interests are not overshadowed in the political struggle for critical materials in the months ahead.

The first indications that DPA and NPA were vulnerable to political pressures appeared after a large group of mayors and municipal school officials complained to Congress that elementary school construction was receiving too little steel and copper. Shortly afterwards their allocations were increased.

Then the highway builders and users supported by State governors, complained that the highways needed and deserved more steel and copper. They got it.

Small business groups went to Congress and complained that allotments had been reduced to the point where many little manufacturers would be forced out of business. Larger allotments were promised.

Employment in the building trades began to fall off sharply in New York City. Both New York senators intervened with the defense agencies. Senators from other States followed suit. NPA promptly readied a plan for allocating more critical materials for construction purposes in "distressed areas.

After taking steps to please those groups, some of whom unquestionably deserved help, our defense officials decided it was time to make a smart political play in the opposite direction. Since so-called "luxury housing" always is a good political target, they conceived the idea of limiting all new homes to one and a half bathrooms—a move calculated to please many more voters than it would offend.

That proposal fell of its own weight in view of the fact that copper was the only critical material involved and the amount of copper per home was restricted anyhow. But the political purpose probably was served.

The point is that no administrator in Washington can divorce himself from politics even in time of national emergency. If he isn't "reasonable," he doesn't stay very long in his job. Just as politics has played a leading part in bringing about adjustments in allotments of critical materials, so will the same force play an equally prominent part in determining how fast decontrol will come and who will get the breaks when that process starts.

Those who sit back and wait for justice to take its course are likely to be disappointed.

Detroit Builder Edward Rose Gets City-Wide Tribute

One of the highest tributes ever paid a Detroit builder was received by Edward Rose when he celebrated his 30th anniversary in the business recently.

Rose, who has erected 8,000 homes during his career, was honored at a party given by his four sons, now helping him in the building business. Awards were presented by the National Association of Home Builders, the Builders Association of Metropolitan Detroit, Michigan Corporation and Securities Commission, and Detroit Common Council.

On hand for the event were officials of the city, the Veterans Administration, Federal Housing Administration, building material firms and other allied industries. Page advertisements in Rose's honor, paid for by suppliers, appeared in the three metropolitan newspapers.

He has been very active in the Detroit association, serving as first vice president in 1950.

Head Plywood Institute

Recently elected president of the Hardwood Plywood Institute was M. C. McIver, president of the Penskeo Veneer Co. and board chairman of the Splicedwood Corp., Mellen, Wis. F. S. Kuhn of the Southern Laminating Co., Memphis, was named vice president. Charles E. Close of Chicago was re-elected secretary-treasurer.

Home Builders League Salutes New Industry Locating in S. Jersey

Industrial expansion taking shape in the Camden-South Jersey area, which is expected to reach $2 billion when completed, was recently hailed by the Home Builders League of South Jersey with a "testimonial salute" to the new industries.

Included in the huge blueprint for expansion are many new industrial plants, equipment, new housing for new employees, a network of highways, bridges and other transportation facilities.

The formal salute was a League-sponsored dinner at the Hotel Walt Whitman, Camden, attended by more than 450 representatives of industry.

Principal speaker was Thomas E. Mills, executive vice president of the National Steel Corp., which plans to build a $200 million plant in the area.

An additional "welcome" was given in a special Home Builders League section of the Camden Courier-Post, which the League and other local firms supported with advertising. The section covered details of the expansion program, plans announced by the home builders to provide housing when it is needed, and other home building news.

Heads NAHB Executives

NEW LEADER of the Executive Officers' Council, James W. Pearson, executive director of the Home Builders Association of Metropolitan Washington. He was elected president of the NAHB division at its annual meeting held during the convention last January.

N. Y. Employer Officers

Fred J. Driscoll was reelected president of the Building Trade Employers' Association of New York City for a second term. Other officers named at the group's recent annual meeting were Harry J. Stellan, vice president; William B. F. Drew, second vice president, both reelected; Joseph A. Courter, third vice president; and William Angus, treasurer. W. Arthur Riell was reappointed secretary.
Des Moines Gets Top Home Week Awards

First prize awards in American Builder’s 1951 National Home Week Contest were presented to the Home Builders Association of Des Moines at a recent dinner in the Iowa city. Des Moines won in Group II—associations with from 150 to 250 members. The awards—hand-lettered scrolls—were presented by American Builder architectural editor Arthur V. Hansen, American Builder architectural editor

WASHINGTON is more concerned these days with the subject “Guns vs. Butter” than with anything else, political matters excepted.

The subject isn’t new. “Guns vs. Butter” was neatly packaged last year when the National Production Authority announced the Controlled Materials Plan, with resulting civilian sacrifices. Production of steel, copper and aluminum was estimated and allocations made as between civilian and military needs. But a new, major factor, recently introduced calculations of last year, and even early this year, appears to have been astonishingly inaccurate.

Result is daily announcements such as this morning’s headline “Surplus Metal Going to Civilian Products.” It seems that automobiles will be given additional steel, copper and aluminum in the second quarter. In the meantime, restrictive orders for housing continue to limit the quantities of these metals. It is particularly confusing when one considers how little metal a house requires as contrasted with automobiles and when one reads of the great housing shortages of defense workers and military personnel. Just why this Administration selects housing as the first industry in which drafted sacrifices must be made, for so-called patriotic reasons, is difficult to understand.

The supply of metal items isn’t our only problem. At recent hearings before the Committee on Banking and Currency nearly thirty of the nation’s outstanding experts in building and mortgage lending discussed at length a series of problems related to 1952 production of housing.

Some of the obstacles disclosed: inadequate interest rates in FHA and VA; inadequate supply of FNMA authorization; unsatisfactory FHA debenture volume in excess of 800,000 units. This is encouraging. Home builders historically have been able to find substitute materials of equal quality when necessary.

Housing Administrator Foley gave a rather reassuring statement concerning probable volume of 1952 housing. He indicated that although a 40 per cent reduction in the critical materials made available to this industry should produce 800,000 new dwelling units, sufficient ingenuity on the part of the industry to substitute other materials might produce a housing volume in excess of 800,000 units. This is encouraging. Home builders generally speaking, throughout the three-day round table discussion, bankers favored increased interest rates, and FHA debenture rates. Home builders, represented by NAHB president Brockbank, assumed no position on this highly controversial point but did maintain that financing was inadequate in many parts of the country, and a particularly difficult problem in the more remote areas where the permanence of housing projects could properly be questioned. An optimistic observer of this conference could reach the conclusion that between the builders, lenders, government agencies and the Congress, satisfactory solutions to the financing problems will be reached.

However, this is of little value unless the “Guns vs. Butter” issue is settled within the mobilization agencies and the NPA allocates a sufficient quantity of basic metals for home building. The time has come for careful re-check of the statistical phases of this important question. A clear-cut, definite policy should be set up which would be as equitable to the home buyer and the home building industry as allocations have been to the automobile industry and most other great industries throughout the country.

Robert Lyons New President Of Northern Hemlock Group

Robert W. Lyons of the Wm. Bonitas Lumber Co., Neenah, Wis., was elected president of the Northern Hemlock and Hardwood Manufacturers Association at the group’s recent meeting in Land o’ Lakes, Wis. Approximately 135 members and guests were on hand for the annual event. Also named to office were C. D. Zadelmeier, Newberry, Mich., vice president, and W. W. Gamble Jr., White Lake, Wis., treasurer.

Speakers included A. E. Swanke, retiring president; Thomas Mason, National Production Authority; Richard G. Kimbell, National Lumber Manufacturers Association; and Frank Moore, purchasing agent, Chicago and North Western Railroad.
Seattle Master Builder Leaders

EXECUTIVE COUNCIL for 1952 of the Seattle Master Builders Association: Standing, left to right, E. L. Novak, president; Dan M. Nascimento, vice president; J. W. Morrison, secretary; and Albert LaPierre, treasurer. Standing are Trustees Ross P. Hobb, V. O. Stringfellow, Harold Larsen, Samuel Andersen, H. K. Schroeder and Kenneth Larsen. Not in picture are trustee F. K. McAbee and executive vice president V. H. Dent.

Story of Home Building Told in Grade School Instructional Unit

Students in the grade schools of the country now have a chance to learn about the housing industry through a program just launched by the educational committee of the National Association of Home Builders.

The program, according to Fritz Barnes, committee chairman, is part of the association’s long-range public relations campaign “to develop a better understanding of the social and economic significance of housing, and of the services performed by the housing industry.” The course, for intermediate and upper grades, takes the form of an industry-sponsored educational “unit” in a recent issue of The Grade Teacher.

An accepted teaching aid, this publication is circulated to 500,000 public elementary teachers who are said to instruct more than 12,000,000 students. As the unit is designed for classroom use, reprints are available in quantity to teachers desiring to use it.

A feature of the unit is a play, to be performed by the students, depicting the search of a typical American family for a new home. It covers the reasons why the family wants a new home, in registration day home builder and tells how he works, and shows the new features of modern houses.

Supplementing the information contained in the play are exercises and work projects to be carried out at home or in the classroom. They are correlated to subjects usually taught, such as language arts, social studies, arts and crafts, maps and chart-making, science and arithmetic. Field trips to local housing projects, lumber or brick yards, or nearby plants of building material manufacturers are also suggested.

While the school program is largely self-operating, the educational committee is urging individual builders and local NAHB affiliates to cooperate with schools in their localities in order to obtain maximum utilization.

Texans Honor Fred Seale

Richard L. Davis

Perlite Institute Names Richard Davis Secretary

Richard L. Davis has taken the post of secretary-treasurer of the Perlite Institute, it has been announced by J. John Brok, institute president and board chairman.

As secretary of the Industrial Mineral Wool Institute for the past 11 years, Davis was given credit for the establishment of the industry’s product certification program and the introduction of a number of standards and specifications in the Bureau of Standards, American Society for Testing Materials, and the technical committee on heat insulations of the Federal Specifications Board.

From 1944 to 1941 Davis was with the management engineering firm of Stevenson, Jordan and Harrison, serving first as a statistician and subsequently in various executive and managerial capacities.

Material Handling Group Names 1952 Officers

J. West Shea of the Union Metal Manufacturing Co., Canton, Ohio, was elected president of the Material Handling Institute, Inc., at the group’s recent annual meeting in New York.

The 78 member companies of the institute produce industrial trucks, hoists, conveyors, monorails, casters, batteries, steel strapping, and containers.

Named to the posts of first and second vice president respectively were John C. Mavis of American Engineering Co., Philadelphia, and H. M. Palmer, Lewis-Shepard Products, Inc., Watertown, Mass.

47 Complete Dealer Course

Forty-seven students completed the recent 30-day course of the Indiana Lumber and Builders’ Supply Association, held in cooperation with Purdue University. It was the eighth of the group’s annual training programs for dealer employees.

The Association called the course the most successful it has sponsored so far. Active in organizing the 1952 course were Harold V. Main, Indiana association education committee chairman; Merle M. McCutcheon, coordinator of adult education for Purdue; and Robert L. Cratt, association field representative.

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Or—write Owens-Corning Fiberglas Corporation, Dept. 62-D, Toledo 1, Ohio.

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Notes Concerning The Convention Daily

Sir: I wish to express my gratitude to the entire staff of the American Builder for the splendid cooperation they gave me and, particularly, for the splendid contribution made by your fine publication in giving us again the Convention Daily.

It has become a definite part of our annual convention. I know that hundreds of builders, dealers, and others look forward to having it each morning, and from the members I get reports that hundreds of copies were either sent or taken back home so those who did not attend would have an opportunity to realize what they missed.

I do not know of a better way to create interest in future conventions than through pictures and the printed word emanating each day from all our activities.

Paul S. Van Aken, NAHB Convention and Exposition Director

Contest

Sir: As usual, you fellows did an outstanding job for NAHB at the convention. Your part in our program certainly was appreciated. The Convention Daily, I can assure you, is a very important part of the success of this great meeting.

J. B. Haverstick,
NAHB Convention Chairman

Useful to Small Town Contractors

Sir: I certainly enjoyed reading your “Convention Daily” while attending the recent NAHB conference in Chicago. It was my intention to preserve each of those daily issues in my office files, but due to the press of other pending matters, I apparently misplaced them. I would certainly appreciate it if you would forward to me a copy of each “Convention Daily” issue.

Franklin L. Burns, President,
D. C. Burns Realty & Trust Co.

Express Our Appreciation

Sir: May I again express my appreciation, and the appreciation of the delegates of this association, for the splendid convention coverage in your American Builder Convention Daily. This daily coverage is, without a doubt, one of the highlights of the affair, and is followed religiously by a great many of the delegates in attendance.

I took home approximately 250 copies of each issue which is being mailed to our builder-members so they may enjoy the magnitude of this national get-together. Next year it is my intention to send out daily mailings to our members direct from Chicago.

Many thanks for the splendid coverage of our National Home Week promotion. It is going to give our 1952 promotion a terrific boost. Be assured we will make the best of the valuable publicity.

Lawrence W. Nelson, Executive Vice President,
Minneapolis Home Builders Assn.

Sir: Could you favor us with 24 copies of each issue of the Convention Daily published by you Monday through Thursday at the 1952 NAHB Convention in Chicago? You’re to be congratulated on your fine coverage of this convention.

There is no doubt in our minds but that your “Whose Is It?—Where Is It?” contest stimulated traffic to each and every booth at the show. Congratulations on this splendid promotion.

John M. Ganges, Advertising Manager,
Wadsworth Homes

Sir: It was indeed a pleasure to cooperate with you and the other members of the staff of the American Builder for the “Whose Is It?—Where Is It?” contest.

There seemed to be a tremendous amount of interest in the contest, because I recall many people coming by our booth to check our picture, which appeared in the first issue of the Convention Daily.

Certainly I think it is a very excellent undertaking for your publication, and one that created a great deal of interest among the exhibitors and those who attended the exhibit and convention. In the event you have this contest next year, we will be more than glad to cooperate in the event we exhibit our products at the NAHB show.

John A. Reagan, Jr., Advertising Manager,
Somoco Products Company

Sir: I want to take this opportunity to express our appreciation for the American Builder award for our participation in National Home Week. From all appearances we will be in Class II next year, and I assure you we will expect to win this coveted award in ’53. By appointing a chairman now, we expect to get off to a good start and wind up with a bang.

Ken Stowell, President, Wichita Assn. of Home Builders

Change Our Address Please

Sir: Attached is an address tab from one of my American Builder magazines. I wish that you would be sure and change the address on the rest of my issues because I do not want to miss a single issue, if possible.

As a rule when I see a new issue it’s in the evening. It is very seldom that I get to tear the wrapper off because my wife usually has done it for me and is talking about the blueprint plan as soon as I get home.

We just built a new home for ourselves. The American Builder helped us considerably, as we gained many ideas from its pages and incorporated some of our own and got what we think is an ideal plan, at least for our purpose and liking.

From the operative builder’s point of view, I like the Technical Guide and How-To-Do-It departments because we do a great deal of repair and remodeling work.

J. F. Morton,
Omaha, Nebr.

Thank you for Your Interest

Sir: Instead of congratulating you for publishing my article (American Builder, Dec. 1951, Pg. 176) and telling you that the “Builder” will be a better magazine in the future because of it, I would like to thank you for interest in my contribution, and for the check which you sent.

Somewhere in your file you have another contribution of mine having to do with stairways, and the reclaiming of attic space in small houses. I sent these articles to you as “feelers” to see if you would publish them on merit.

I am an associate professor of Industrial Arts-Education here in the
At the present time there is quite a backlog of "How-to-do-it" suggestions on hand. Your contribution having to do with stairways and reclaiming attic space in small houses is among them. We hope to use it in an early issue. We are always interested in how-to-do-it ideas that offer job shortcuts to our builder-readers.—The Editor.

Thanks For Accepting

Sir: Thank you very much for accepting two more of my "How-to-do-it" suggestions and sending me a check in the amount of ten dollars.

You can rest assured that I shall endeavor to submit more and better ideas from time to time, for I know that these suggestions will be a great help to the readers of the American Builder magazine.

Thanking you again most sincerely, I remain,

Herbert E. Fey,
New Braunfels, Texas

Please Send

Sir: As a draftsman, I have read your magazine with a great deal of interest for several years. Even though it is my employer's copy and sometimes it takes several weeks to get passed down, it is still timely.

You have had two series of articles I would like to have: Engineered House Construction and Construction Lumber and Recommended Framing Practices. Will you advise me if I can still get reprints of these and if so how much will they cost?

D. Colopy
Trail, B.C.
Canada

The two series of articles are being sent to you. We trust they will be of use to you in your further study of these subjects.—The Editor.

As a shopper in your community, how do you go about finding all the products and services you need?

If you do what 9 out of 10 shoppers do—you probably go right to the 'yellow pages' of your local telephone directory.

That is a buying habit that has been going on for over 60 years. We know...because we've checked with folks in communities throughout the nation again and again.

That's why so many building contractors consider it smart advertising to have their name and sales message in the 'yellow pages'.

Check the headings in your local Classified...make sure your name is under the products you sell and services you render.

Put yourself in your prospects shoes...

FOR FURTHER INFORMATION, CALL YOUR LOCAL TELEPHONE BUSINESS OFFICE
LOCAL TIE-INS FEATURING as advertised in House Beautiful

Will add prestige to your promotion...VOLUME TO YOUR SALES

You'll find plenty of pulling power added to your Spring promotional activities, if you build them around the forthcoming issue and the top-quality names on its advertising pages—names like the typical best-sellers whose pre-view trade messages appear below!

Additional high-style colors—Coral, Lilac and Red—were used in the new Antico Plastics Rubber Flooring—a value-packed blend of rubber and plastic.

Beauty and protection are two outstanding qualities of CABOT'S CREOSOTE SHINGLE STAINS. Deep penetrating, these stains bring out the natural beauty of wood grain. Excellent range of colors. From clear brilliant hues to weathering grays and browns, 60-90% creosote oil content gives durability, sheen and lasting protection.

Using increased space and color, this company's May ad in House Beautiful features the exclusive CASE ONE PIECE WATER CLOSET and style-matched Windell's Lavatory. The One-Piece is the first water closet with integral low level tank, first with non-overflow, Fixtures available in white and 26 colors.

CONGOLEUM-NAIRN'S new "Fashion Floors" of Gold Seal Inlaid Linoleum give you the opportunity to offer to your custom designed floor the look of an ordinary linoleum pattern. Congoleum Nairn is promoting this unique idea in a charming full color page in six leading decorating magazines.

AWNINC WINDOWS—Illustrated catalog no. BY gives sizes and types, hardware specifications and construction data on GATE CITY owning windows. Prices, discounts, and complete architect files are available. Write to the Gate City Sash and Door Company, Fort Lauderdale, Florida.

Helping dealers to sell more profitably... and been a KIRSH policy for four decades. Certainly Kirsh has profited through this policy. So have dealers. Many times over! In fabrics and workroom services, as well as in the drapery hardware. It's a wonder what dealers have a firmly-rooted feeling for Kirsh.

Sanitary garbage storage—safeguards against breeding disease spreading insects—is a advantage of MAJESTIC UNDERGROUND CAR-RAGE RECEIVER. Housing with step-operated lid is buried in the ground conveniently near the kitchen door. Removable inner can simplifies removal by collecting free reader by writing to the Majestic Co., Huntington, Indiana.

Build an OUTDOOR FIREPLACE—the subject of a profusely illustrated 32 page book containing complete details and plans of numerous fireplace designs, plus information on needed materials, construction helps, cooking tips and recipes. Title is "How to Enjoy an Outdoor Cook-Nook". Price 25c. MAJESTIC CO., Huntington, Indiana.

Model "MS3" SANETTE is an outstanding example of what can be done by "setting up" an ordinary utility item in the kitchen. This deluxe step-on can is of new, square, space-saving design to harmonize with modern cabinet-type appliances. It is fitted with a round, rounded-to-clean, leak-proof, hand-dipped galvanized inner pail. Master Metal Products, Buffalo, N.Y.

"National Water System Month—May 1953" is the theme of a MYERS WATER SYSTEM advertising appearing in the May issue of House Beautiful. A new promotion aid on water systems being offered Myers dealers is a plastic illusiated sign for outdoor display purposes. For information on this and other marketing aids, write E. E. Myers and Bros. Co., Ashland, Ohio.

The MOR-SUN PRESSED STEEL FURNACE (gas and oil) is unique in that it is a Mass Precision Produced! Everthing is designed for consumer efficiency—a self-lubricating control mechanism, less than four pounds over-all weight. Light weight, easy to install, fires wood, oil or gas. Price: $149.00. Motion Wholesale, 3909 Lower Yost St., Los Angeles 28, Calif.

AMERICAN BUILDER

THE WARNER CO., Chicago, interprets today's textured trend in wall decoration with their BAMBOO TEXTURE WALLPAPER, another example of the new Town House collection. Its colorful, yet subdued and rugged efficiency, is adaptable to the contemporary or traditional. There is a plain colored dependability, through use of superior materials, at moderate prices. Sells for 80c a roll, fabric and paper are available to the consumer for 25c.

Iawn mower sales are now in full swing. The new WORCESTER ROTARY AND ELECTRIC MOWERS are proving to be fast sellers, as are the 21-inch Worcester Shear Master featured in national advertising and the 18-inch power mower. Get your share of this extra business. Write today for catalogue.

The Hollywood broadloom quality is being presented of the Spring shows by the M. J. WHIT-TALL Assd., Inc. of Worcester, Mass. It is a plain color tartan in which the pattern is formed by random height pile making a graceful burl of the woof design. It is available in gray, blue, and jade green in 27", 9", and 12" widths priced in the lower western market for retail at $11.30 per square yard.

Now, even though there is still snow on your lawn, NOW is the time to apply VICTORY. Mowing snow and early spring snow will soak it into the soil feeding the awakening grass roots to give your lawn a fine early start. Feed Virginia now.

"This House Will Give You Ideas" and it will, too. Ideas about the greater comfort your customers can get in a CARRIER WEATHERMAKER HOME. Details of the new Air Conditioning Unit which heats and cools to make a house completely pleasantly, luxuriously livable the year around. Offers booklet of complete information.
THE PRODUCTS YOU CARRY!

Special offer

Want a special display for your windows or counters as a prestige influence on prospective customers? It’s yours for the asking—featuring a House Beautiful cover and enlarged to a dramatic 21” x 33” size! Simply check the square indicated on the coupon below and mail it to us. But we suggest you do it today. The supply is limited.

SEND TODAY for eye catching “Right from House Beautiful” display cards, an effective tie-in newspaper mat...a special House Beautiful cover display enlargement. They’re available free of charge.

For display cards, mounted with advertisements you want to feature, check any or all of the products on the May issue listing below that are preceded by a number. For a mat, in which product names can easily be inserted, and a special cover display, check the squares indicated. Fill in your name and mailing address, mail to: Merchandising Division, House Beautiful Magazine, 572 Madison Avenue, New York 22, N. Y.

1. AMERICAN STANDARD HEATING
2. AMTICO RUBBER FLOORS
3. ANCHOR FENCES
4. BLUE RIDGE PATTERNED GLASS
5. PERMANENT MAGNET DOOR CATCH
6. BRIGGS & STRATTON GAS ENGINES
7. BRUCE HARDWOOD FLOORS
8. BURNHAM BASE RAY RADIANT BASEBOARDS
9. CABOT COLLOPHORES
10. CABOT CREOSOTE STAINS
11. CAMBRIDGE CERAMITE
12. CARRIER AIR CONDITIONING
13. CASE PLUMBING FIXTURES
14. CHAMBERLIN STORM WINDOWS
15. CHRYSLER AIR TEMP
16. CINCO-TERMOSALED SCREEN AND STORM SASH
17. CONGOLEUM-MARIN GOLD SEAL
18. INLAID LINOLEUM
19. CRANE PLUMBING FIXTURES
20. CURTIS SILENITE WINDOWS
21. CUTLER HAMMER MULTI BREAKER
22. OUTSIDE CUSHIONETTE WATER SYSTEM
23. DOWFLAKE
24. DUBOIS FENCES
25. ELDER PLUMBING FIXTURES
26. ESTATE RANGES
27. FAIRBANKS HORSE WATER HEATER
28. GATE CITY WOOD AWNING WINDOWS
29. HABITANT FENCES
30. HAMILTON CLOTHES DRYER
31. HARTSHORN TEXTILE SHADES
32. HEINEKE EXCELSO POWER MOWER
33. HOMKO POWER MOWER
34. INCREDIBLE ENAMEL FOR POOLS
35. JOHNSTON POWER MOWER
36. KITCHEN HANGING HARDWARE
37. LORD & BURNHAM ORLY GREENHOUSE
38. LORENTZEN BLINDS
39. LUMINALL PAINTS
40. MAJESTIC UNDERGROUND GARBAGE RECEPTOR
41. MAJESTIC OUTDOOR FIREPLACE
42. MALLARD SCREEN DOOR GRILLE
43. MARBLE INSTITUTE FLOORING
44. MASTER METAL SANETTE
45. MICHIGAN PEAT
46. MILCOUR PICK UP CART & TOOL RACK
47. MISSISSIPPI STRUCTURAL CORRUGATED GLASS
48. MODERNFOLD DOORS
49. MORRISON STEEL FURNACE
50. MUELLER CLIMATROL
51. MYERS WATER SYSTEM
52. MACH FERTILIZER
53. OASIS AIR DRIER
54. OZITE CARPET CUSHION
55. PEKRA-STONE
56. PHILCO FREEZER
57. PITTSBURGH CORNING GLASS BLOCKS
58. PORTLAND CEMENT CONCRETE HOUSES
59. PRECISION FOLDING STAIRWAY
60. PRESTELINE BUILT-IN ELECTRIC RANGE
61. OLD QUAKER ATMATIC PAINT
62. RA-PID-GRÖ
63. RIDE-A-MOWER
64. ROBBINS & MYERS ATTIC FANS
65. RUSTICRAFT FENCES
66. SAVAGE YARD CHIEF
67. SETA-CASE CANVAS PAINT
68. SMITH PERMAGLASS AUTOMATIC WATER HEATER
69. SOS INVISIBLE HINGES
70. SPEEDLINE TOOLS
71. STASCO TOILET SEAT
72. STOCKWELL COUNTRY MODERN WALLPAPER
73. STRAHAN WALLPAPER
74. SUNBREAM HEDGE TRIMMER
75. SWIFT END-O-PEST
76. TWIN MASTER JR.
77. TRIG-GENE ROSE SPRAY
78. T.S. U.S. CARPET CUSHION
79. U.S. RUG UNDERLAY
80. U.S. QUARRY TILE
81. UPHOL RIVER KRANK
82. VIGORO
83. WARNER BAMBOO TEXTURE WALLPAPER
84. WATERBURY PORTABLE LOWER
85. WEBSTER BASEBOARD HEATING
86. WHITTALL BROADLOOM
87. WINDOR JALSUJIES
88. WINKLER AUTOMATIC HEATING
89. WORCESTER SHEAR MASTER

* No card available

□ ’Seen in House Beautiful’ Mat
□ SPECIAL COVER DISPLAY

NAME ____________________________

ADDRESS ____________________________

CITY ____________________________

AB-MAY 1952
MAN OF THE YEAR—It's Gene Klein, the citizen mayor of thriving Amarillo, Texas. The News Globe-Times, local newspaper, voted him the 1951 Award for Community Service. Stating that a citizen mayor serving for virtually no salary might justifiably go about his own business, leaving the running of the city to the city manager,” the newspaper comments that Mr. Klein has made a full time job of his mayoralty, spending as much time at the City Hall as he does in the office of his Star Lumber Co.

STANDS FIRMLY—"The mayor,” says the newspaper’s editors, “has had to say ‘No’ firmly and often, and so he has made enemies. This newspaper has not always been in accord with him, but the mayor of a town the size of Amarillo can’t be expected to please all the citizens all the time.”

TRAVELS WIDELY—"He travels frequently and far,” continues the newspaper. “He has argued railroad presidents out of underpasses. He has kept the state highway department aware of the acute traffic problem here. He has maintained the city’s water supply ahead of demand. He has wrestled with tough problems. Wisely he has hired experts to advise him in his work.”

NO SURPRISE—To hundreds of builders and retail lumbermen who know this dynamic and personable Texan, the newspaper’s choice comes as no surprise. And speaking of public relations, isn’t this kind of volunteer leadership in civic development about the best there is?

CELLARS VS BASEMENTS—W. G. Stephens of Phoebus, Va., really started something when he questioned the use of the word “basement” in a recent American Builder story. Of all the volunteer entries into the debate, one from J. H. Lilly, building inspector of Cedar Rapids, Iowa, seems to represent the consensus most completely. It’s in accord with what Mr. Stephens claimed in the first place.

THE IOWA LAW—Says Mr. Lilly, “the law of the State of Iowa defines cellars and basements as follows: A basement is a story partly underground, but having at least one-half of its height above the curb level, and also one-half of its height above the highest level of adjoining ground. A basement should be counted as a story. A cellar is a story having more than one-half of its height below the curb level or below the highest level of the adjoining ground. A cellar shall not be counted as a story for purposes of height measurement.”

BUILDING CODES—Mr. Lilly continues, “The Basic Building Code of the BOCA and the Uniform Building Code of the P.C.B.O. both carry definitions of basements and cellars. In the various Departments of Building Inspection these definitions are very much in use, especially in multiple dwellings, for the purpose of determining whether or not apartments may be located below the first floor of the building. A typical cellar as defined is not suitable for living quarters, while a basement can be so utilized, provided other requirements are met.”

PHEW!—It’s been a long pull to get this subject thoroughly aired—or excavated. And now, in spite of the practice of most architects to label any subterranean or partly subterranean story “basement,” guess we’ll have to alert the staff to measure the heights against the curb levels and adjoining ground, and then pick the right term.

ALIBI—It is inexplicable, of course, but we had always held the opinion that a cellar was merely an undeveloped basement—dirt floor, unfinished ceiling, unfinished walls—a place that was supposed to be cool and damp for the storage of roots. We thought it was the earth floor under an old-fashioned farm house that determined a cellar, and that it became a dignified thing called a basement merely by providing a floor, and dressing it up.

KIWANIAN OF YEAR—In Durham, North Carolina, the Kiwanian of the year is James H. Coman, Jr., of the Coman Lumber Co. He was awarded the title and the trophy that goes with it in recognition of his “work as chairman of the Agricultural Committee which sponsored the Fat Stock Show and Sale in April, 1951.”

THE COMANS—Jim, Sr., with three talented sons due home from the war in 1946, anticipated their problems, and started a lumber yard in Durham. With one boy an architect.

(Continued on page 36)
New Homes Sell Faster With

DELCO-HEAT

Says N.Y. Builder

Delco-Heat "OPC" Conditionair—a vertical-type, oil-fired forced warm air furnace—designed for utility room, alcove, or closet installation or wherever floor space is limited. Three sides of the unit are clear of flue outlet and controls so it may be easily installed in recessed areas. Capacity 75,000 BTU per hour output. Other Conditionair models to 200,000 BTU output also available.

Delco-Heat oil-fired steel boiler—for radiant heating systems—or conventional steam or hot water systems in popular size homes. It's ideal for installation in restricted areas or utility rooms. Available with round or cabinet type jacket. Net rating, 300' steam or 480' hot water radiation.

"We have used Delco-Heat in our homes on Long Island because of the terrific sales appeal it has with the buying public," writes Mr. Jack Wyn, President, Wyn Homes Inc., Great Neck, New York. "We have found that Delco-Heat Conditionairs are the most economical furnaces we can install. And many customers have told us how pleased they are with the performance of their Delco-Heat units." Wheeling Metal Fabricators, Inc., Hempstead, N. Y., made the Wyn Homes installation. Pictured above, from left to right, are Mr. Jack Wyn, Mr. Irving Steckler, of Wheeling Metal Fabricators and Mr. Nat Eisenberg, of Wyn Homes, Inc.

The sales appeal and prestige of General Motors Delco-Heat is becoming increasingly apparent to builders all over the country. Home owners demand the highest quality, most dependable heating equipment available and that's what they get with Delco-Heat. Builders especially like Delco-Heat because the line is complete. There is a Delco-Heat Conditionair, boiler or burner to meet every builder's need. And Delco's low, competitive prices fit any budget.

Delco makes gas or oil-fired heating equipment for any size home—any type heating system. Get the facts now! Send coupon below.

For a good deal

DEAL WITH DELCO

DELCO APPLIANCE DIVISION, Dept. AB
GENERAL MOTORS CORP., Rochester 1, N. Y.

Please send me complete details and specifications on all Delco-Heat units.

Name

Address

City Zone State

CLIP AND MAIL TODAY!
another endowed with administrative ability, and a third with unquestioned sales ability. Jim Sr., reasoned that a retail lumber and building business was an enterprise that all four, including himself, could run happily and successfully. He was right. Again, speaking of public relations, it appears that Jim Jr. is doing very well.

ED KIRWAN—Writing to his Congressman this Kentucky retail lumber dealer proposed "that for the period of the emergency Congress set the basic work week at 50 hours instead of 40, and forbid any and all premium pay, regardless of any contracts or agreements to the contrary, until after the fiftieth hour. I believe that the increased production resulting from the extension of work time would greatly lessen the impact of the war effort on the civilian economy."

THE REPLY—In part Kirwan’s Congressman agreed. In fact, he did agree, but stated that "I am afraid that from a practical standpoint this will be very difficult to accomplish during the life of the present Congress. The errors of the past half generation are catching up with us and sometimes I am quite discouraged as to the outlook for the future."

As stated in this column some time ago the only reason the work week was pegged to 40 hours was to distribute the work during the depression. Now, if production is a matter of life and death, what’s wrong with a residential order to step it up to 50 hours? Of course, we’re being naive when we ask the question. We know the answer as well as anyone else. But it’s still a good question.

PERFECTION—Out of one of the winter conventions came this provocative thought. It’s author said, "There is no such thing as a perfect salesman, and there never will be. A salesman PRACTICES selling just exactly as a physician PRACTICES medicine. Merchandising and medicine are always changing, and it is continuous application of practice to both that determine the effectiveness of either a salesmen or a physician."

TAX LEGISLATION—On January 21 the Georgia House passed a tax limitation resolution. Similar action by five more states is needed for the introduction of a bill in Congress designed to limit personal and corporate income taxes to 25 per cent of gross income.

SAY IT AGAIN—That’s what Gates Ferguson, Celotex director of advertising, has been doing in a forceful, down-to-earth way for the past several years as a feature speaker at lumber dealer and home builder meet-

ings. He talks merchandising—what it is, and why it must be improved. In great demand and as a repeat speaker several times before the same organizations, Mr. Ferguson wraps his story in a new package each year—uses the same theme, but gives it a new twist. It’s this repeating of the theme that is getting results.

TESTIMONIALS—At several retail lumbermen conventions this year, the conductor of this column has shared speakers’ rostrums with Mr. Ferguson, who was making his second or third appearance in each case. Without exception, at the end of each program, a number of dealers came to him to state that they had taken some of his advice from previous speeches they had listened to, and were back for more ideas. A few stated that they had watched competitors use some of the Ferguson ideas into use, and had come to the convention to make notes on what they evidently were passing up.

THIS IS PROOF—That Ferguson’s ideas are catching on is definitely proved by the testimonials he is receiving in person. That he should continue preaching his gospel of merchandising over and over again to the same people, and to new members that he adds to his audience each year is proved by the fact that the same people do come back year after year for more ideas. Again, it’s this business of sticking to the theme year after year that gets results, and as Ferguson presents his fresh, new, package of merchandising ideas and principles annually, interest and results multiply.

LOS ANGELES—The public housing battle, raging at white heat in this city, is producing a tremendous impetus to cleaning up broken down houses. Opponents of public housing have always maintained that most of the problem of sub-standard housing would disappear if the sanitation and public safety laws were enforced. Since the big push for law enforcement started a few weeks ago 350 houses were placed in livable condition by their owners.

PUBLIC SUPPORT—Home builders in Los Angeles have enlisted the solid support of churches, Parent-Teacher Associations and other civic groups.

THE PROBLEM—It’s finance. Noticeable is the fact that the owner of a broken down property can get money to purchase a television set, but can’t get money for a new roof. Currently, the problem is being attacked by starting a lending institution for the purpose.

REPAIR MARKET—With financing made available there will be a tremendous market for materials for repair and rehabilitation in Los Angeles. And, if Los Angeles home builders can solve the problem of rundown properties, so can builders in other cities.

MANUFACTURERS—If the new home market is cut back below production potential for many materials in 1952 it might be well for manufacturers to think of tailoring some of their advertising to telling how to use their materials in repair and rehabilitation.

NATIONAL HOME WEEK—It is a natural, simple, easy and highly effective public relations program, and the most successful merchandising program the home building industry ever had.

DEALERS—But, why hasn’t it caught on with retail lumber dealers? Only a few score of them have conducted National Home Week observances in their communities. Those who have, endorse it with enthusiasm. What about the others? Why doesn’t the idea click with all of them?

FORTY PER CENT—There is, or can be, a great difference between a cutback of 40 per cent in critical metals for housing and a 40 per cent cutback in housing starts. The difference can, and probably will be measured by the ingenuity of builders in finding ways to stretch critical metals over more houses than heretofore, and in finding ways to perform some construction operations without metals, where they have been used in the past. Unless government, for reasons that have nothing to do with material supply, decrees a flat cut, 1952 will see close to 1,000,000 starts.
only BH&G

is so BIG—both ways!

It's the world's only package of 3½-million ideal building materials prospects — screened for the BUY on their minds!

7 out of 10 families building new homes read Better Homes & Gardens! But that's only the beginning—

BH&G, with 3½-million circulation, is the top-ranking magazine of special interest to all families owning, maintaining and improving homes!

BH&G families have bigger-than-average incomes. They repair or remodel their bigger-than-average homes at the rate of 1½-million jobs a year!

These are all mighty good reasons why ads about your wares do so much for you in BH&G — but here's the biggest reason of all:

BH&G families are editorially screened for the BUY on their minds—for their interest in, and ability to buy, what's new or better. AND—these 3½-million families consider BH&G their friendly counselor on all home improvements!

No wonder lumber and building materials dealers—by a vote of 7 to 1—acclaim BH&G as their greatest selling aid among all magazines!
CRAWL SPACE PLENUM SYSTEM of perimeter heating is used only in a crawl space house

Crawl Space Plenum System of Warm Air Heating

discharges heated air, circulated freely through the crawl space, so that it enters the room directly through registers placed in the floor, which serves as a radiant panel

In this system the entire crawl space is used as a warm air supply plenum or chamber. Stub ducts from a sheet metal plenum suspended from the floor joists distribute the heated air evenly through the crawl space. Warm air then enters rooms above through perimeter floor registers placed beneath the windows. With this combination forced warm air and radiant system a substantial part of the heat required by the room is supplied by the warmed floors.

CRAWL SPACE PREPARATION. The preparation and treatment of the crawl space walls and floor are of the utmost importance. All organic matter from the earth beneath the structure must be removed. Foundation walls must be well constructed and insulated. A protective covering must be laid over the ground to avoid moisture problems.

The crawl space must not be used for storage. The access opening (not smaller than 18x24 inches) must be equipped with a tight fitting door. The floor of the habitable areas above the crawl space must not be insulated. The crawl space floor must be at least 18 inches and not more than 24 inches below the bottom of the floor joists.

FOUNDATION WALL CONSTRUCTION. The walls should be constructed to minimize air leakage, moisture penetration and heat losses through them. The outside of the walls should be covered with ½-inch coating of portland cement plaster and then given a heavy coat of undiluted hot tar or asphalt.

The heat loss through the crawl space must not be greater than that of the rest of the structure above. A ½-inch-thick vaporproof insulation board can be nailed or cemented to the inside surface of the wall. The insulation should completely cover the foundation wall from a few
Living fungi, which break down the substance of wood are microscopic and abundant. But they need a certain amount of WARMTH and DAMPNESS to develop. Dampness will also peel off paint, crumble plaster, rust iron and steel.

Some insulations promote and retain destructive condensation inside walls and other structural spaces. In addition to warmth, vapor of water also flows right through asphalt, paper, plaster and most building materials, including ordinary insulations. It condenses when it strikes a colder surface and reaches a dew-point.

An empty space is the best insulator against heat flow by Conduction; but does not prevent heat flow by Radiation and Convection. Of all heat transferred through structural spaces, 50% to 80% is by Radiation; all but 5% of the rest is Convection. Multiple accordion aluminum sheets throw back all but 3% of the Radiation which strikes them, and block Convection. Their insignificant mass, 1 oz. to the square foot, and their multiple air space construction, minimize Conduction.

They have zero permeability to water vapor and all other gases, including air, hot and cold. Because of their structure, they are non-condensation-forming, for a dew-point can never be reached on any of their surfaces. Neither can they sustain nor retain fortuitous moisture.

Simple and illuminating discussions of vapor and heat flow, including explanations of how to prevent timber rot, will be found in the just-off-the-press, completely revised, 5th edition of “Simplified Physics of Vapor and Thermal Insulation,” 56 pages of facts and figures.

The commercial forms of tough, multiple accordion aluminum sheets are Infra Type 6, Type 4, and Type 4 Jr.
(Continued from page 38)

inches above the crawl space floor to the top of the masonry. The insulation must not extend down into the ground. The outside walls between joists from top of the plate to bottom of the floor boards must also be well insulated.

All openings and cracks through walls that lead to the outdoors must be sealed to prevent moisture penetration and air leakage.

VENTILATION. Vent openings in outside walls are required by FHA to minimize humidity conditions. At least two vent openings are required with a total free area of one square foot for each 100 linear feet of outside wall. Vents must be closed during heating season and opened during the summer.

Crawl Space Plenum System

The floor of the crawl space must be treated to prevent the heated air from coming in contact with moisture-laden surfaces. One acceptable method is to place a moisture membrane upon the earth and pour a two-inch-thick slab over it. Another method is to place a four-inch-thick layer of coarse fill upon the ground surface and cover it with a moisture-proof membrane. This must form a continuous covering over the entire area with joints between laps (at least four inches) sealed with a suitable compound. The membrane must be carried up the side of the foundation at least six inches and terminated under the foundation wall insulation.

CRAWL SPACE PLENUM SYSTEM. This system differs in many respects from any other that has been (Continued on page 44)
Ideas for the Man on the Job

A SHINGLING BRACKET

To make an effective shingling bracket take the blocks that are cut out of stair stringers and nail a strip of heavy gauge sheet iron on one side. Nail the top of the metal strip under the shingles and use a 2x6 inch plank on top of wood blocks for a toe hold. The exposed portion of sheet metal is cut off at the edge of shingles when roofing is done.—John Menkveld, Grand Rapids, Mich.

CUTTING STAIR STRINGERS

To save one 2x10 inch member when cutting stair stringers, use the blocks that are cut out of two stringers to nail to a 2x4 inch member to make the third stringer. This stringer can be used in the center.—John Menkveld, Grand Rapids, Mich.

TRIMMING KNOTTY PINE ROOM

When making a port hole window in a knotty pine room, trim the window as usual and then take ordinary file handles and rip them in half. Use these cut handles to obtain the wheel effect around window.—John Menkveld, Grand Rapids, Mich.

CUPBOARD DOOR TEMPLATE

This simple device is a template for marking holes for installing cupboard door handles.

Template is made of cardboard, usually the same box in which the handles are delivered. Mark the holes with a sharp awl.—John Menkveld, Grand Rapids, Mich.

SETTING STEEL POSTS

When setting steel posts under an I-beam, weld ½ inch ring on the top and bottom plates the same size as the inside diameter of post. Plates can be welded to beam at the shop. The posts can then be set without welding.—John Menkveld, Grand Rapids, Mich.

ROOF BOARD BRACKET

This is a bracket that can be picked up and placed anywhere on the roof in the process of applying roof boards or shingles. The bracket is made of ¾ inch thick material and of shape to fit the pitch of the roof. Through the bottom member drive several 1½ inch roofing nails so the points show about ½ inches. This will keep the bracket from sliding.—John Menkveld, Grand Rapids, Mich.
A method of bending metal tile at corners is shown in the drawings and photograph here. A jig is made of two 1x6 boards, hinged. Corrugated box board is glued to one board and masking tape to the other to avoid scuffing the surface of the tile. When tile is at room temperature it is placed in the jig. A small block is used to hold tile in place while bending. Edges of the 3/8-inch-thick block are beveled to fit tile. Cut the edge of each side of tile with tin snips at point of bend before bending. By bending tile at corners a better appearance is obtained than by using hard-to-get chrome strips.—LeRoy Bradley, Lorain, Ohio.
PLACING SCREEN MOULDINGS

Nail together screen mouldings shown at B with ends projecting. Saw through mouldings at B with thin saw. Mouldings of various widths may be mitered by sawing on a line through C-C. Window screens with a three-inch bottom rail can be cut this way, or as shown in E-E or C-C.—M. J. Hiland, Lansing, Mich.

A CLOTHES CHUTE DOOR

A simple method of hanging a clothes chute door is to pivot it on two nails. These nails to be placed about one inch from the top of the door. The door will then close of its own weight.—John Menkveld, Grand Rapids, Mich.

HOLDING BARN SASH OPEN

For hanging stationary storm windows, two pins are placed in the top rail of the sash that fit into corresponding holes in the head casing. Place a hook and eye on the inside to be secured to sill.—John Menkveld, Grand Rapids, Mich.

HANGING STORM WINDOWS

To hold barn sash open, cut the stop on one side on an angle at the desired height. Drive a nail in the center of the cutout portion of stop and then permit sash to rest on one end of stop with the other side of stop against the fixed portion.—John Menkveld, Grand Rapids, Mich.

IMPROVISED STAR DRILL

To make an improvised star drill take a piece of pipe of the required diameter and file notches in one end with a saw file. This can be used in a pinch when a star drill is not available.—John Menkveld, Grand Rapids, Mich.

MARKING GAUGE FOR FLOORS

Instead of using a mitre square for cutting subfloor make a block with both cuts on either end; nail a cleat on the side and with the use of this gauge the work can be done faster.—John Menkveld, Grand Rapids, Mich.
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3. FIBERGLAS insulation Type PF-613, 2" thick — bonded to concrete ceiling using MIRACLE PRONGED ANCHORS at Radio City Studio. CONTRACTOR, William J. Beatty, Inc., New York, N. Y.


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Crawl Space Plenum System

(Continued from page 40)

described. All the heated air delivered by the furnace is discharged into the crawl space which then serves as a supply chamber for the registers in the floor above. There is no duct connection between the furnace and the registers.

The crawl space must be considered as an additional room and its heat losses also entered as a room. The perimeter registers should be placed in the floor beneath the windows. The return air grilles are placed near the ceiling. All grilles should be properly sized.

The air from the furnace is delivered into the crawl space through a minimum of four ducts, each at least six feet long, attached to the suspended plenum chamber beneath the furnace. These ducts are necessary to evenly distribute the heated air in the crawl-space area and assure approximately equal air temperature at each register.

Judgment must be used in placing these ducts. It is desirable to keep them less than six feet long. When necessary, however, they may be more than six feet long if the added length is needed so the air stream projected from them will reach the desired areas, which are usually the corners of the building. In a small beam with a centrally located furnace, a duct should be directed toward each corner of the crawl space. All of them should be the same size and about the same length. If a beam interferes with free air circulation within the space, one or more of the ducts should be extended beyond the beam. In an L-shaped house or one with a portion extending out from the main part, a duct should be extended far enough out to assure the delivery of warm air and good circulation in the crawl space. In an installation of this kind the ducts should be sized in proportion to the percentage of the total heat loss of the structure that is represented by the climatic conditions.

The use of this system may result in more rapid shrinkage of the wood floor and subfloor structural members than in the crawl space houses with other types of heating systems. It should not cause undue concern since it is merely an acceleration of a completely normal drying out process. The recommendations set forth in this text comply fully with the requirements of pamphlet 90 of the National Board of Fire Underwriters.

FURNACE SELECTION. Practically any type of automatically fired, oil or gas burning forced warm air furnace may be used. The down-flow furnace which takes return air in at the top and discharges heated air downwards from its base is best suited for this particular type of installation. A down-flow furnace installed on the wood floor of a crawl space house must be set over a plenum of proper size and both the furnace and plenum supported by a base of non-combustible material. The space between the plenum and framing must be packed with fireproof insulation.

Data and drawings through courtesy of National Warm Air Heating and Air Conditioning Association, Cleveland, Ohio.
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How to Find the Center of Any Irregular Member

Where an irregular piece is used for lath work and it is necessary to find the center, first lay the piece to be worked flat on a bench and mark across end. Turn piece one fourth the way around and make second mark. Make the other two marks in the same way. If the piece is circular make marks approximately at right angles to each other. The center of the small figure will be easily determined for lath centers.—M. J. Hiland, Lansing, Ill.

A Spool for Plumb Line

A handy way of carrying and using the plumb line is to wind and store it on an empty adhesive tape spool. The plumb line (3) is tied to and wound on the tape spool (1), with the plumb bob tied to the other end of the plumb line (3). The spool cover (2) is slipped partially off the spool (1) when the line (3) is wound and unwound. When the line (3) is stored or ready for use, the spool cover (2) is closed, thus clamping the line (3) tightly between the spool (1) and cover (2), preventing line from unwinding further than desired.—W. W. Howe, Longview, Wash.
Congressmen Impressed as Builders Swap Ideas
At Trade Secrets Meeting in Washington

HERE a builder finds out how to save both metal and costs with a new heating design. There a developer turns up a new style of window. Across the continent, a novel storage wall idea proves practical. And so it goes: the ingenuity of the local home builder continues to meet the test of high costs and material shortages.

After months of spreading success stories among themselves and those closely allied to the industry, NAHB members produced a highly affective "trade secrets" presentation in Washington last January during a time when NPA was considering further restrictions.

It was no secret that the more than a dozen Congressmen and Federal officials who attended were noticeably impressed while listening not to skilled orators but to builders from all sections of the country, proudly disclosing their part in a vast cooperating drive to build better value into housing.

NAHB President Alan E. Brock-

bank conducted the two-hour session in the absence of his predecessor, W. P. "Bill" Atkinson, who pioneered the "trade secrets" movement. More such informative meetings are on the way.

Each exchange in this continuing series produces some new development, it seems. The Washington conference heard the first details about a product of intense research which may, in time, revolutionize the plumbing industry.

Carl Bestor of Purdue University described a new type toilet said to virtually eliminate the need for waste disposal, even though using but a small percentage of the water required in present models.

Pointing out that a river purifies itself after flowing two miles, Bestor said similar action in the toilet is obtained speedily by bubbling air through a tank by means of an air compressor. This is operated at 20 pounds pressure by a one-sixth horsepower motor.

Use of this water closet does away with both sewer and septic tank, Bestor claimed, the only waste connection leading to a 60-gallon drum. The product is now said to be undergoing tests by health authorities.

V-SLOT CONCRETE BLOCK offered by Martin J. Bartling Jr., Knoxville, Tenn., who estimates its use can save about 200 linear feet of wire per house. Exterior is designed to look like shingle siding. Next to Bartling (at mike) is scale model of his storage wall closet, built of wood to effect savings on shelving, flooring, hardware and trim.

NEAREST SECRET IS THIS "WASTELESS" TOILET, being described by Carl Bestor of Purdue University as a radical new design needing no sewer or septic tank.

TWO FITTINGS DO WORK OF NINE in this arrangement, making possible an extra half bathroom for only $55 more. This is an innovation of Andrew Place.

WINDOW UNIT, also exhibited by Place, a wooden awning type easily washed inside and out. It has a Thermopane glass framed in 1½-inch stock.
How to Locate the Center of a Circle

This is an easy method for locating the center of a circle with the aid of a carpenter’s square. Place the square on the circle as shown in position 1. Mark point A, B, and C with a line. Join points D and E with a line. The point of intersection of these lines A-C and D-E is the center of the circle.—Fred Chott, Cicero, Ill.

How to Plug Holes in Wood Forms

Cut small squares of sheet metal to the required size with sufficient lap for the proper covering of hole. Bend ¼ inch of each corner to form prongs as illustrated. Place the prepared piece of sheet metal over the hole in wood forms. Force prongs lightly into wood surface to hold it in position and then drive into the wood surface with a block of wood and hammer.—Alexander J. Benko, Spotswood, N. J.

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APRIL 1952
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Furring Strips

To eliminate nailing strips and the extra thickness, it is proposed to apply 1/2-inch insulation board decorative plank 16 inches by 12 feet to a painted plastered brick wall with adhesive. The walls are in good repair and are not too uneven. Can a durable job result and what kind of adhesive should be used? Is spotting the adhesive better than spreading it?

B.D., Wonewoc, Wis.

We would suggest that you move with caution in regard to applying the material, such as you suggest, directly to plastered brick walls, providing, of course, that the plaster was applied directly to the brick wall.

As a rule, you will invite an unpleasant moisture condition when you apply the insulated plank without furring strips. However, if the walls have been plastered for some time and you have not run into that condition, then it may be safe to use adhesive on the material. Adhesive should be spread over the entire surface with a notched spreader.

Leaking Roof

I have a laundry room in my basement that is under our porch. When it rains, water seeps through the wooden deck and makes the laundry room damp and cold. I thought of concreting the deck but that is too expensive. How can I waterproof the deck so that I can insulate and install heat in the basement. I would like to cover the deck with some material as seamless as possible and not too expensive.

A.B., Philadelphia 29, Pa.

I believe that your best answer to the problem would be to apply a 90-pound roll roof directly to the wood deck. In order to prevent the surface of the roofing from being scuffed up from the porch traffic, it would be necessary to place a removable wood deck on top. This wood decking would cover the entire surface of the porch and would be built-up in approximately 3x3-foot sections for easy removal, and also for proper drainage. The decking squares could be made of 1x4 or 1x6 boards spaced one inch apart. The boards can be nailed to 2x4 inch framing members, laid parallel with the pitch of the porch floor.

Cement Base Paint

About two years ago a new house was constructed of cinder blocks and was painted with two coats of white Aquella. I am considering repainting the cinder blocks this spring with white cement and lime mixed, five parts of cement to one part of lime. I am familiar with the wetting procedure before and after. Please let me know whether I would get satisfactory results?

G.P., New Milford, Conn.

Rather than attempting to cover the present surface of the wall with the white cement and lime mixture, it would be better to purchase a prepared cement base paint that would correspond, or be equal to, Federal Specifications T.T.P. 21. The prepared cement base has a water repellent in the mix which is essential. The mixture that you attempt to prepare yourself does not have the holding power or qualities that are obtained in the prepared material. If you use according to the manufacturer’s instructions, you should get satisfactory results.

Concrete Finishing

Many architects specify a 4-inch mesh reinforced concrete underslab, covered with a mopped waterproof membrane, and topped with a 3- or 4-inch slab.

We find it difficult to get a nice finish job on the top slab due to quick setting and shrinkage, leaning a pattern of wide cracks. In hot weather I have seen cement set hard in 10 minutes, after pouring. The bulk cement used in our transit mix, is usually hot from the kiln.

Is there any method of pouring or a retarder that we can use to get a better finish job?

W.O.D., Riverside, Calif.

Judging from the fact that you are having difficulty getting a good finish from cement on the top slab due to quick setting and shrinkage, it would appear that the temperature of the transit mix is too high. This causes the concrete to set too rapidly. The correct temperature should be 70 degrees or less.

The quick setting, shrinking and the appearance of the wide cracks could be attributed to a number of causes. The brazing or cracking could be caused by over-finishing of the cement which causes the water to come to the surface and be quickly evaporated.

The quick evaporation can also be caused by the hot sun pouring down on the freshly poured slab. If possible, shade should be provided for the slab.

This would ward off the hot sun. Another reason is that the bottom slab could be too hot at the time of the pouring. The mopped waterproof membrane’s black color would have a tendency to absorb and hold the heat. In correcting the heat problem, you will correct the difficulty.

Aluminum Sash

About two years ago I purchased some aluminum casement windows. I have not installed them yet and have stored them in a good dry room with no heat. I
I am seeking information on found small cavities in the metal. Do you have any information on this condition? Is there a paint or a coating I could put on them to stop this condition?


I would suggest that you take the windows out of the storage area, thoroughly rub them with steel wool and clean them. Then apply one coat of clear lacquer over all the exposed surface. This will keep the frames in good condition until they are ready to be installed.

Unfinished Attic

I am seeking information on construction details for an unfinished attic in a Cape Cod style home. Better Homes and Gardens referred me to your magazine. Can you help?

J.S., Fairlawn, N.J.

It is rather difficult to give a clear and concise answer to a problem such as yours where information is meager and sketchy.

We are assuming that your house is the typical Cape Cod with a vertical knee wall of about 30 inches, with the balance of the wall following the slope of the roof rafters. In order to make this space available for a room area, vertical studs 16 inches on center should be placed parallel to the present knee wall so that a minimum of five feet shall be established for this vertical surface. Top and bottom plates, of course, shall be placed on the present rough floor and the underside of the rafters, on which to secure the studs. Two by four collar beams spaced 16 inches O.C. or the same as the roof rafters, shall be placed horizontally at the established ceiling line. These collar beams to be secured to the roof rafters.

Most building codes have set up definite requirements in regard to the development of attic space. Basic requirements are that knee walls shall be a minimum of five feet in height, and that the flat area of the ceiling of the room shall not be less than 75 per cent of the floor area. Also, that the ceiling height shall not be less than seven feet from the finished floor to the finished ceiling.

It is recommended that insulation be installed in the walls, the exposed roof rafters, and the ceiling around the room or rooms to assure maximum comfort.

Renewing Marble

Could you please inform me as to a good way to clean, finish, or repolish marble.

J.H.S., Oelwein, Iowa

Old marble that is dull can best be cleaned by using oxalic acid and tin oxide to form a paste. To apply it to the marble, make a burlap or wool mop that has been moistened. Dip the mop into the mixture of oxalic acid and tin oxide and rub vigorously on the surface of the marble. This should renew the surface.

Correct Sander

I would appreciate very much if you would recommend a reliable type of power sander for smoothing gypsum board taped joints.

E.P.T., Schenectady, N.Y.

An orbit type of sander has found favor with a great many of those engaged in this type of work. It can be purchased from any of the leading power tool manufacturers.

Laminated Gypsum Wallboard

Could you give me information on laminated gypsum wallboard? I would like information of size of nails and types of cement. Also tell me what type of spreader blades are used.

H.A.Z., Garden City South, Long Island, N.Y.

The Gypsum Association recommends that 13 gauge, cooler type uncoated nails spaced 5-7 inches O.C. on the ceiling and 6-8 inches O.C. on the side walls be used to hold the first layer. The second ply gypsum wallboard is laminated to the first with the same cement as used for the joints, or that recommended by the manufacturer.

Adhesive is applied to the back side of the wallboard with a notched trowel in an irregular pattern to an even distribution. The adhesive should extend to the extreme edges of the wallboard. The trowel notches should be approximately 2x\( \frac{3}{4} \) inches and not more than two inches O.C.

The second layer can be nailed to hold in place or shorn, in lieu of nailing. Nails can be placed 12 inches O.C. on the ceiling and 16-24 inches on side walls. Permanent or temporary scaffolding nails can be used.

Will Insulated Sheathing Hold Paint?

There is a problem that I have failed to see answered as yet and I wish to "Ask the Experts" for an answer. I have heard the question argued but every one seems to have a different answer. The question is: Will wood siding or a composition board hold paint if applied directly against insulated sheathing? If not, what is the difference in applying it against wood sheathing with a waterproof paper between?

W.F.W., Addison, Pa.
Three design changes in each house, with each design distinctive in its own right, features this month's "American Builder Blueprint House. The variations are accomplished through judicious use of materials, colors, and changes in roof arrangements. By relocating the fireplace chimney and altering the fenestration a distinctly modern note is obtained in one house.

Each house contains approximately 1,000 square feet of living area, exclusive of the garage. The sale price of each is $17,000, including a 60 by 125-foot lot in an exclusive section of the city. The price includes a concrete drive, walks, and complete landscaping, including shrubs.

A living room, dinette, kitchen, three bedrooms and a bath, and the average number of closets comprise the layout of the first floor. A full basement is provided with space devoted to heating, storage and laundrying. The attic, accessible from a scuttle in the ceiling of the hall, contains additional storage space. The square type of plan employed produces the greatest amount of economy during the construction.

While the firm that built these houses erects approximately 200 houses per year, they hold to standard construction methods in all work. Short cuts are obtained on the job by men accustomed to using on-the-site power equipment.

Basement walls are built up of concrete blocks, waterproofed with an exterior cement coating. Floor and wall framing are of wood, with brick or stone veneer on front. Roof is covered with asphalt shingles. Exterior surfacing of frame walls is double course siding shingles.
# Quantity List of Materials

## For American Builder Blueprint House No. AB 178

**Norman R. Johnson, Architect**

### General Information

<table>
<thead>
<tr>
<th>Description</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>House — Type</td>
<td></td>
</tr>
<tr>
<td>Area</td>
<td>990 sq. ft</td>
</tr>
<tr>
<td>Cube</td>
<td>18,810 cu. ft</td>
</tr>
<tr>
<td>Porch — Area</td>
<td>48 sq. ft</td>
</tr>
<tr>
<td><strong>Excavating</strong></td>
<td></td>
</tr>
<tr>
<td>Trench for foundation</td>
<td>12 lin. ft</td>
</tr>
<tr>
<td>Chimney and column footings</td>
<td>3 cu. ft</td>
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<tr>
<td>Excavation for basement</td>
<td>257 yards</td>
</tr>
<tr>
<td><strong>Cement Work</strong></td>
<td></td>
</tr>
<tr>
<td>Foundations</td>
<td>210 cu. ft. conc. footings</td>
</tr>
<tr>
<td></td>
<td>910 sq. ft. 12 in. block</td>
</tr>
<tr>
<td></td>
<td>150 sq. ft. 8 in. block</td>
</tr>
<tr>
<td>Concrete Work</td>
<td>866 sq. ft</td>
</tr>
<tr>
<td>Waterproofing</td>
<td>1,025 sq. ft</td>
</tr>
<tr>
<td>Wire Lath</td>
<td>130 lin. ft. 1 ft. wide</td>
</tr>
<tr>
<td>Miscellaneous</td>
<td>50 sq. ft. porch stope, 41/2 in. thick, reinforced</td>
</tr>
</tbody>
</table>

### Masonry

<table>
<thead>
<tr>
<th>Type</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Walls</td>
<td>250 sq. ft</td>
</tr>
<tr>
<td>Window Sills</td>
<td>3 stone sills</td>
</tr>
<tr>
<td>Chimney</td>
<td>Brick or stone</td>
</tr>
<tr>
<td>Flue Lining</td>
<td>20 — 8'x12'</td>
</tr>
<tr>
<td></td>
<td>12' — 12'x12'</td>
</tr>
<tr>
<td>Cap</td>
<td>Cement</td>
</tr>
<tr>
<td>Fireplace</td>
<td>Brick or Stone</td>
</tr>
<tr>
<td>Throat and Damper</td>
<td>1</td>
</tr>
<tr>
<td>Lintels</td>
<td>1</td>
</tr>
<tr>
<td>Miscellaneous</td>
<td>Ash drop and cleanout doors</td>
</tr>
</tbody>
</table>

### Iron Work

<table>
<thead>
<tr>
<th></th>
<th>720 pounds</th>
</tr>
</thead>
<tbody>
<tr>
<td>Structural</td>
<td>80 I.F. 1/2&quot; reinforcing rod</td>
</tr>
<tr>
<td>Miscellaneous</td>
<td>1070 b.f.m.</td>
</tr>
</tbody>
</table>

### Millwork

| Windows — Type       |          |
| Double hung and basement casements |         |
| Windows glazed including trim | 1 — 21 ft. 28"x16" |
|                       | 7 — 21 ft. 32"x24" |
|                       | 1 — 21 ft. 24"x20" |
|                       | 1 — 21 ft. 40"x24" |
|                       | 2 — 21 ft. 36"x24" |
|                       | 1 — 21 ft. 32"x20" |
|                       | 6 — 6 ft. 28"x17" |

| Exterior doors        |          |
| Type — Sash           | 1 — 2'6"x6"x8" |
| Slab                  | 1 — 3'0"x6"x8" |

| Exterior millwork      |          |
| Shutters               | 2 pair |
| Entrance Fascias       | 1 |
| Louvers                | 3 |

| Interior doors including jamb and trim |          |
| 7 — 20'x6"x8" |
| 6 — 2'6"x6"x8" |
| Special Interior Doors | 1 of the 2's doors is sliding |

| Special Interior Millwork |          |
| Fireplace mantel, kitchen cases and counter tops | |

### Carpentry

| Joists                | 2 — 2"x10" — 18' |
|                       | 24 — 2"x10" — 16' |
|                       | 26 — 2"x10" — 13' |
|                       | 4 — 2"x10" — 10' |
| Bridging              | 100 lin. ft. 1"x3" |
| Studding and Plates   | 210 — 2"x4" — 8' |
|                       | 50 — 2"x4" — 12' |
|                       | 8 — 2"x4" — 14' |
|                       | 20 — 2"x4" — 16' |
|                       | 3 — 2"x6" — 8' |
| Ceiling Joist         | 16 — 2"x6" — 16' |
|                       | 5 — 2"x6" — 20' |
|                       | 15 — 2"x6" — 14' |
|                       | 30 — 2"x6" — 12' |
|                       | 2 — 2"x8" — 10' |
| Roof Rafters           | 54 — 2"x6" — 90' |
|                       | 10 — 2"x6" — 18' |
| Framing Lintels        | 6 — 2"x8" — 8' |
|                       | 1 — 2"x8" — 8' |
| Subfloor               | 1500 b.f.m. |
| Side Wall Sheathing    | 1200 b.f.m. |
| Side Wall Materials    | 11 sq. cedar shingles |

### Millwork

| Hardwood — 700 sq. ft. area to cover | 160 lin. ft. 1"x6" fascias |
| Softwood — 120 sq. ft. area to cover | 860 sq. ft. double thick balsam wool |
| Tile floor and wainscots in bathroom | 1000 sq. ft. standard thick balsam wool |
| Hardwood — 700 sq. ft. area to cover | 1000 sq. ft. standard thick balsam wool |

### Rain Conduction

| Gutters               | 34 lin. ft. 2" x 10" |
|                       | 34 lin. ft. 1"x 8" |
|                       | 200 b.f.m. D&M for basement |
| Downspouts            | 53 feet |
|                       | 30 feet |
| Flashing              | Valley, chimney, window heads |
| Miscellaneous         | Clothes chute |

### Roofing

| Type: 210# composition shingles |          |
| Area: 11 squares | |

### Interior Walls

| Area to be covered | 360 sq. yds. lath and plaster |

---

This quantity list will be subject to variation depending on the common practices in various sections and municipalities of the country, the techniques of individual builders, the types of materials available locally and cost factors. The list published here is a suggested one, complete enough so that it can be used in arriving at a reasonably accurate estimate of the quantities and cost of materials that will be required to complete the structure. It was prepared by experts at the Edward Hines Lumber Co., Chicago.

**APRIL 1952**
HOW TO PICK THE RIGHT HEETAIRE
for every room
You Build or Modernize

The FOUR FACTORS to be considered in choosing specific HEETAIRES for specific jobs are:

1. Size of Room
2. Exposure of Room
3. Use of Room
4. Climate

These four factors — size, exposure, use and climate — are the keys for selecting the specific HEETAIRES and temperatures necessary to heat any room.

In general, wattages per cubic foot determine the size of HEETAIRE recommended — but these wattages vary according to heat loss in the room (wall, window and door exposures) and according to the outside temperatures (e.g., more wattages per cubic foot are necessary in New York State than in Tennessee). In addition, the use of room to be heated determines the temperature desired and the type of HEETAIRE recommended — radiant (infra-red) heat, or heated air. Radiant heat is recommended for rooms where the primary objects to be heated are people (Series 200, 230, 240); heated air is recommended where general temperature levels are to be maintained (Series 210, 250).

Series 210 and 250 HEETAIRES are recommended for both supplementary and general heating.

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Tested and listed under reexamination service by Underwriters' Laboratories, Inc.
Thermostatic or Manual Control...Radiant Heat...Heated Air and Fan-Forced Radiant Heat...Wall Inserts and Wall Attachables.

MARKEL • LA SALLE
ELECTRIC PRODUCTS, INC.
PRODUCTS, INC.

151 SENECA ST., BUFFALO 3, N. Y.

No. D-89
Window Wall, Exposed Ceiling

Window walls and exposed wood ceilings are most effectively used in conjunction with post and beam construction of sidewalls and roof as shown in detail drawing on opposite page. In this case a 5 foot 6 inch wide unit of spacing was established around which the entire plan was developed. Walls are built up of 4x6 inch vertical posts on which are placed double 2x12 roof beams separated with 2x2-inch spacers. These beams bolted to the posts form a frame, which make all walls, both interior and exterior, non-load-bearing or curtain walls. Two inch thick decking, with one inch of rigid insulation and a built-up roof, form the roof surface.

How to Flash a Chimney

When flashing a chimney, instead of using flashing hooks or nails, roll together a one inch strip of waste metal about eight inches long into a tight roll until it forms the thickness of the raked out joint. Insert the roll into the joint to hold the flashing and caulk as usual.—John Menkveld, Grand Rapids, Mich.

Cold Drinks Preferred

A simple and effective way to keep soda, milk or other drinks cold is to put the bottle into a wool sock, (or other piece of cloth, cotton will do). Soak the sock in water and hang bottle in a breezy place. The evaporation of the water in the sock will keep the contents of the bottle cold.—Geo. Wilson, New Haven, Conn.
AMERICAN BUILDER'S BETTER DETAIL PLATE

NO. D-89 WINDOW WALL...EXPOSED WOOD CEILING

Elevation...

Sections...

FLUORESCENT LIGHT

4" PLYWOOD CURTAIN TRACK

2" X 6" T & G DECKING

2" X 4" OUTLOCKER NAILED BET

2" X 12" JOIST

2" X 6"

Fascia

Metal Stop

Built-Up Roof

2" X 2" Separators

Insulation

Metal Stop

FLAT FLOOR

GRADE

Fixed Glass

4" X 8"

Sill

Electric Conduit

Fixed Insul. Rod

Door

4" X 8"

Fixed Glass

Brick

INCHES
A, {Si ... designed for the job

When installing acoustical tile choose a job-designed nail that combines ease of application with these special features: a head end which allows the nail to be driven home without damaging the tiles ... a collar which holds the tiles firmly in place... annular threading which gives superior holding power. The nails are furnished with a plated finish to prevent rust streaks where moisture is present. Send for free samples and descriptive literature.

JOHN HASSALL, INC.
182 Clay Street
Brooklyn 22, N. Y.

"WHEN customers come to us with replacement problems for rotted, or broken basement windows, we always suggest replacement with Insulux Glass Block."

Make the comparison! Figure it out for yourself! Compare the cost of sash, screen, storm window and maintenance against that of a lifetime panel of maintenance-free Insulux Glass Block.

A panel of Insulux Glass Block can't rust nor rot, never needs painting. Glass block is extremely hard to break ... makes a sound, weathertight, insulating panel. And glass block lets in all the light yet blocks out sight.

* Supplies of glass block and all of the accessories needed are non-critical and immediately available in quantity. Installation is simple and quick ... requires only ordinary mason's tools.

Want more information about this use of Insulux Glass Block? Just write: Daylight Engineering Laboratory, Dept. AB4, Box 1035, Toledo 1, Ohio. Insulux Division, American Structural Products Company, Subsidiary of Owens-Illinois Glass Company.

INSULUX
"WALLS OF DAYLIGHT"
—by the pioneers of Daylight Engineering

ACOUSTICAL TILE NAILS
... designed for the job

No. G-30
Steel Framing for Show Window

This month's detail plate, which deals with the construction techniques employed in the remodeling of a store building, is the first of two dealing with this problem.

The object here was to design a show window ceiling, housing all the necessary lighting effects to permit a brightly lighted display window.

The merchandise that was to be displayed required display windows approximately 7 feet 6 inches high. To retain the width and height of the original store front opening, the new show window ceiling was built 7 feet 8 inches above the show window floor. This ceiling arrangement, which projects six feet from the sidewalls, gives the appearance of hanging in space without any visible means of support. To accomplish this, cantilever construction was employed.

Due to the fact that the building wall was constructed of 2x4 studs, it was impossible to use this wall for support. To accomplish a cantilever effect, a 3-inch channel vertical tie extends from the bottom of the five inch channel outriggers of the canopy framing, down to the floor level where it is attached to a 3x3x3/4 inch angle. Above the five inch outrigger and five inches out from the edge of the outrigger, a 3x3x3/4 angle extends to the ceiling where it is fastened to a continuous steel channel. A 3x3x3/4 angle follows the outside edge of the canopy framing to make for a rigid job.

The show window floor framing is constructed entirely of 3x3x3/4 inch angles. This frame is supported at the wall on 3x3x3/4 angles attached to the 3-inch channel vertical ties. The front of the show window frame is cantilevered over the bulkhead framing which is also constructed of 3x3x3/4 inch angles.

The entire canopy framing and show window floor framing are made up of all welded construction and were delivered to the site as a single unit. The installation was speedy and because of shop fabrication the measurements were accurate. This enabled the show window metal contractor and carpenter to proceed without further delay.
No. G-30 - STEEL FRAMING for SHOW WINDOW

Boteles - NYC.

Line of floor below.

Canopy framing plan.

Show window floor.

Bulkhead framing.
Kinds of Paint Coatings
And Their Nature...

Chapter 3 in a series of 8 articles on paint in the building business. This one outlines the various general types of coatings for specific surfaces

Many types and grades of house paint coatings flood the market. They can be classified broadly in three groups of high-grade white or tinted paint. This classification has been well established. All three groups use linseed or other drying oil for the vehicle, no resin of any kind, and variable proportions of volatile thinner and drier. They differ in the nature of the pigments used, and the Forest Products Laboratory classifies them on this basis. In group L is included pure white-lead in ready-to-use form; group TLZ includes ready-mixed paints made with titanium dioxide, white lead, and zinc oxide; group TZ includes lead-free paints made with titanium dioxide and zinc oxide for use in places where fumes of hydrogen sulfide are present, causing white lead to turn black.

To generations of builders and painters, “paint” has meant just one thing—pure white-lead in oil. Although use of this old-fashioned staple has been widely supplanted by the modern mixed-pigments paints (group TLZ), lead-in-oil is still used and comes as a soft paste containing 89 per cent basic carbonate of white lead, 9 per cent linseed oil, and 2 per cent turpentine or mineral spirits, to be thinned properly by the painter and tinted if desired. In spite of the great advantages of the mixed-pigments paints, white lead is still looked on by many experts as the most all-round, foolproof type, and the advice, “Burn it off and paint it with white lead,” is still often the answer to many an apparently insoluble paint problem. White lead paint has a reputation of performing well under adverse conditions such as extreme dryness, or a thickly painted surface, or a wood that does not retain paint well. Perhaps the chief advantage of white lead is its high resistance to cracking and scaling. It has an inherent tendency to develop a pattern of checking, but this goes on more or less inconspicuously for a long time, and there is a long period when the white lead surface looks fairly well. The end result of normal white lead disintegration is a fine crumbling of the pigment, which leaves an easy surface over which to repaint. When the new coating is applied, it soaks up the residue of the old paint. The mixed-pigment paints, by contrast, tend to break up in a much coarser pattern, and if they are not repainted strictly in time, may have to be scraped and burned off before repainting can be done successfully.

White lead has many disadvantages, of course. It chalks only moderately and is only moderately resistant to discoloration by dirt and mildew (or in damp places, it may chalk away too rapidly). The big objection to it is that it will fail by checking, but this goes on more or less inconspicuously for a long time, and there is a long period when the white lead surface looks fairly well. The end result of normal white lead disintegration is a fine crumbling of the pigment, which leaves an easy surface over which to repaint. When the new coating is applied, it soaks up the residue of the old paint. The mixed-pigment paints, by contrast, tend to break up in a much coarser pattern, and if they are not repainted strictly in time, may have to be scraped and burned off before repainting can be done successfully.

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caused by chalking which has been washed down from the face of dormer windows; and too much chalking of a tinted paint will of course lead to early fading. So there are available non-chalking types, and one designed especially for tinting purposes which will not chalk as easily as the white TLZ.

The mixed-pigment type TZ, in which the lead is left out, is made for use in areas where there is a heavy concentration of hydrogen sulfide fumes, as in a heavily industrialized area, or on a seashore location where decaying seaweed gives off sulfide fumes. Since the lead is omitted, the TZ paint is not so durable as other types. But it will resist dirt and mildew well. It usually remains free from checking and cracking until time for repainting, but may chalk too freely. It is used as white paint only, and if tinted will fade badly and in most tints will lose its resistance to hydrogen sulfide.

Mildew-resistant house paint, designed for use on houses located in areas where there is danger from mildew, is available. Sometimes the manufacturer will market a fungicide additive which will give the regular house paint resistance to attack by mildew spores.

**Priming Coats**

For exterior use, white lead is good for priming as well as finish coatings on wood of any kind. And for the following woods, which retain paint longest and withstand weathering well, a good house paint thinned properly can be used successfully as an undercoat: Western redcedar, Southern Cypress, and redwood. However, a modern primer is desirable with woods of all kinds, and is especially necessary with the following: Northern and Western white pine, Sugar pine, commercial white spruce, Douglas-fir, Eastern and Western hemlock, Ponderosa pine, Eastern and Western fir, and Southern yellow pine.

Modern priming coats are of two types. There is the titanium-lead type, made of titanium dioxide and white lead in a vehicle of raw and bodied linseed oil. It has controlled penetration—i.e., the oils do not penetrate too deeply into the wood. There is also an aluminum primer, especially useful for priming new surfaces of these woods: Douglas-fir, Western larch, and Southern yellow pine. However, when aluminum is used, it should be followed by two coats of house paint. Aluminum primer is also recommended by the Forest Products Laboratory for use when the finish coating is to be of the TZ type, for resistance to fumes of hydrogen sulfide. This primer is not recommended, however, for use in repainting.

Priming of inside woodwork involves the use of special priming paints made for use on highly absorptive surfaces such as plaster, cement, and wallboard. The pigments are carried in bodied oils or varnishes and seal surfaces well without penetrating into them excessively.

**Stains**

Stains for exterior wood are basically paints very much diluted with linseed oil, a volatile thinner, and sometimes creosote. They are, of course, cheaper than paints and do not give as good protection against weathering. Good stains contain only pure, finely divided, opaque pigments, free from transparent pigments. Pure iron oxide, chrome, and carbon pigments are considered satisfactory; white pigments less so. The liquid part of the stain should be at least one-third linseed oil by volume, with two-thirds often recommended. Stains are most suitable for rough surfaces such as shingles or siding placed with the sawed side out.

Stains are also much used for interior work to change the color of
the wood. Usually such a stain is one made of pigments combined with oils or varnish together with necessary thickeners. On flat-grain Southern yellow pine, Douglas fir, or other softwoods with wide bands of summerwood, a thin coating of shellac is usually applied as a sealer before using a stain.

Roof, Trim, Porches and Decks

Roof paints are largely modifications of house paints and may contain some resins or material in their vehicles. They may also be of the alkyl (a synthetic) resin type.

Trim colors of the highest quality are enamel-like pigmentation of high oil content alkyl resins. Trim colors are designed for use especially on house trim, shutters, trellis, and other trim structures. They have durability as good as, or better than, house paints. Also, they have the added features of high gloss, good gloss retention, and superior color retention. Also, trim around the steps, doors of open porches, and other outside surfaces that will be subjected to heavy traffic require paints that harden much more rapidly than house paints do. Nothing could be more foolish than to paint a porch floor with the same paint used for the exterior of the house; it would break down at once. Paint for these high-traffic surfaces are made with varnish rather than oil vehicles, and this type of formulation wears down by the scraping of the traffic rather than by the slower action of the weather. This type of paint is used as its own primer.

Masonry Paints

There are many protective coatings available for cast concrete, brick, stucco, asbestos-cement siding, unglazed tile, and lightweight aggregate. These paints can be classified in four groups: highly pigmented oil paint, cement-water paint, synthetic resin-emulsion paint, and paint containing rubber in the vehicle. Under proper but varying conditions they all do a good job of protecting masonry and provide relative degrees of waterproofing.

Oil paint which has been formulated especially for masonry surfaces has good hiding power and provides a durable finish when two coats are applied. Two coats are necessary. When oil paint is used, open-textured surfaces require a preliminary coat of a cement-sand base material. Also, application of oil paint to new masonry should be deferred until the walls have had time to dry.

Concrete-water paints are water-thinnable paints in which portland cement is the binder. They are particularly suitable for the painting of such open-textured surfaces as cinder, concrete and light-weight aggregate block—also for the walls of new structures that normally contain water-soluble alkaline salts. This type of coating comes in attractive colors, has high hiding power, and may be safely applied to damp walls.

The resin-emulsion paints which are suitable for masonry are water-thinned. They bridge the gap between water- and oil-base paints. They have dry film properties similar to those of a flat oil paint and contain the same pigments used in oil paints, but are composed of water-thinned materials, forming an oil-in-water emulsion (the oil molecule is inside the water molecule, the water evaporating and leaving an oil film). A typical resin-emulsion paint is easily applied by brush or spray and dries within a few hours to a smooth, opaque, flat finish. With the exception of magnesium stucco, the most porous masonry—including asbestos-cement siding which has not previously received a coat of waterproofing compound—may be finished with one of the resin-emulsion paints.

Of the rubber-base paints which may be used successfully on masonry, there are two varieties. The rubber-solution type is one in which the synthetic rubber is incorporated in a vehicle of treated drying oils, aromatic hydrocarbons, and coal tar thinners, and pigmented with opaque weather-resistant pigments. The rubber-emulsion type treats the synthetic rubber base with an emulsifying agent, so that the paste paints are reducible with water. Considered especially appropriate for painting asbestos-cement siding and shingles, these coatings also have the ability to seal in stains on old masonry. They also serve as protective primers under finishing coats of resin-emulsion or oil-base paints. They may be applied by brush or spray to dry or slightly damp walls.

Metal Protective Paints

These are metal primers designed to form a good adhesive bond between the metal and the top coat. They are also formulated to retard, inhibit, and prevent rust formation, and to help maintain the appearance and quality, they vary—from the general utility paint, pigmented with iron oxide and extender pigments dispersed in aspar varnish vehicle, to the highly durable zinc yellow primers in alkyl resin vehicles. Zinc yellow primers do an outstanding job. However, where there is not a thorough surface preparation including the removal of all rust, it is better to use a red lead-linsed oil type of primer.

Metal protective top coats are usually oil-type paints for all top-quality exterior enamels. They are applied over the primer in one or two coats to give maximum durability. Aluminum paints are frequently used over primers, and are composed of aluminum flake dispersed in oil-based enamels or alkyl varnishes. Zinc dust paints, in either oil or alkyl resin vehicles, may be used both as top coat and primer. Their outstanding characteristic is good adhesion to galvanized iron without metal pretreatment.

Paints for Interior Work

Oil-type flat wall paints are made with an oil-varnish vehicle and prime pigments that have high hiding power. In addition, they contain extender pigments to build up the pigment volume so that a flat sheen is provided by the dry film. On these glasses of paint—a word of caution. Flat wall paint business runs into large volume and is competitive. Most manufacturers market a “first line” quality flat wall paint under their own name. To meet acutely competitive conditions some manufacturers also market a “second line” quality product at a lower price. These products contain less oil in the vehicle and more low-cost resins, materials such as limed rosin. Made with less hiding power per gallon and cheaper extender pigments, they are likely to become more quickly embrittled with age lose their adhesion faster and peel sooner. In flat wall paints particularly, as in all paints generally, you get just what
that actually show you how to meet your most difficult WATER PROBLEMS.

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- (SB-2) Instructions for pouring concrete slabs on grade without radiant heat
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- (SB-4) When to trowel
- (SB-5) Floor coverings on concrete slabs
- (SB-6) Condensation in concrete slabs on grade
- (SB-7) Basement footings, walls and floors
- (SB-8) Nova-I.P.C Admix
- (SB-9) Relieving joints
- (SB-10) Exterior masonry coatings
- (SB-11) Novacrete Masonry Paint
- (SB-12) Approximate quantities of materials required per 100 Sq. Ft. of various thickness slabs
- (SB-13) Portland Cement, plaster, stucco, floor topping and mortar proportions
- (SB-14) How to find areas and capacities
- (SB-15) Concrete
- (SB-16) Cause and correction of condensation below grade
- (SB-17) Cold weather protection

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A wholly owned subsidiary of Homasote Company—manufacturers of the oldest and strongest insulating-building board; wood-textured and striated panels; 1/4" underlayment for 1/4" linoleum and wall-to-wall carpeting.
you pay for. The most economical finish in the long run is the one with the highest initial cost. To use others is false economy.

Oil-type flat wall paints, as well as oil-type house paints, are marketed in both ready-mixed and paste form, and some new types for interior use are practically odorless. The paste product is totally sold to painters who then add oil and thinners to the paste. They end up with a ready-to-apply product which is comparable to the ready-mixed paint in composition. By this procedure certain economies to the painter are supposedly achieved.

The first-line quality flat wall paints are good but not necessarily the best that can be made. Certain other classes of finishes are superior to them and command a premium price. Such paints are the so-called eggshell finishes, used widely in quality jobs on woodwork and based on non-yellowing alkyd resin vehicles (the vehicle of the ordinary flat wall paint is oleoresinous). The eggshell surface reflects light diffusively. The non-yellowing characteristics, the superior tint retention, and the better washability of the alkyd resin type of flats bring the premium price. (Alkyd resins are made by combining soybean oil, glycerine (or penta) and phthalic anhydride.)

Semi-gloss and gloss finish paints are also used for wood trim in general and for walls and ceilings where gloss washability is important and moderately or highly glossy finishes are customary. These too, are enamel types, made with a varnish vehicle, normally applied in two coats after the wood has been primed. Highly glossy finishes accentuate any defects or irregularities in the wood surface unless special resins have been carefully smoothed and finished.

One-coat flats in today’s market are flat wall paints with higher than normal prime pigment content. They also have certain vehicle modifications to make the paint give optimum one-coat performance. The performance spread between the so-called one-coat flats and many of the first-line quality flat paints is more narrow today than it was a year or two ago. In many instances it has vanished completely.

White wash is a mixture of lime and paint, and in the same class is calcimine, which is a mixture of glue and whiting. The water-mixed paints became an important class of coatings with the development of casein paints. These coatings were based on lithopone as the hiding pigment and casein in a form convertible to a true binder. Easy to apply, they had high hiding power. In paint development they led to the emergence of a whole new class of coatings—the resin-oil emulsion paints, in which resins and oils were emulsified and added to casein. The greater insolubility of the resins and oils combined in emulsions resulted in greater washability.

The market for these oleoresinous flat wall paints grew by leaps and bounds during the war years, and large-volume emulsion paint business was built on these highly pigmented finishes. The vehicle of these paints could be oleoresinous casein or other protein binder combinations using various emulsifying agents and preservatives. The latter were necessary to prevent the putrefaction of the protein portion of the binder. Tons of this material were spread over wallpaper and other wall surfaces, dried quickly, and allowed by house painters to do a fast decorating job. These paints were marketed as pastes, which the buyer thinned to working consistency with water.

There were, however, notable disadvantages to these oleoresinous emulsion paints. Between the products of various manufacturers there was wide variation in performance characteristics—particularly in washability. The best of them could not compare in washability with any first-line oil-type flat wall paint. Also, the sheen was nearly always a dead flat. So there was a real need for a paint with all the ease of application of oleoresinous emulsion paints, but with the washability of oil flats and an alkali resistance superior to such flats and semi-gloss finishes. At the same time, a finish needed to be as free from “ghosting” (porous spots of lighter color than rest of wall) as the dead flat emulsion paints, but provide the sheen of satins and eggshells. The stage was thus ready for the appearance of the rubber-base (latex) paints for wall finishes.

Rubber-Base Paints

Meanwhile there had come on the market various flat wall paints based on cyclized rubber (which is different from the chlorinated natural rubber used in paints for marking concrete floors or swimming pools). These were paints which had low vehicle solids dissolved in organic solvents. They had outstandingly good washability and alkali resistance far in excess of the ordinary oil-type flat wall paints and could be applied directly over porous surfaces and unneutralized plaster. From these, paint chemistry took the next step. Into the line of development came paints which have rubber latex as the main portion of their vehicle. The marketed in ever-increasing volume for interior work are the satinsheen type of rubber-base wall paints which dry quickly to a film that has many characteristics of rubber itself. Most of the particles in the paint are too large to strike into the surface, but coalesce into a solid film, even on porous surfaces. Pioneered on the market in 1949 these latex paints were developed with the needs of the amateur painter and decorator in mind and are very easy to use. They are odorless and contain neither drying oils, turpentine nor paint thinner. The thinner in the can is water.

The latex in some of these new paints is a natural rubber latex. In
PROUD of the house BUT what about the basement?

You have a right to be proud of those modern houses you are building, but what about the basements? Do they have beautiful walls and floors? Do they contain waterproofed cements that assure a dry basement for years to come? Yes, within your hands lies the possibility of creating beautiful, dry basements for home owners...basements that will thrill them as they see the possibilities of a lovely recreation room...a bright laundry...or a playroom!

The cost is much less than you would expect. Simply use Medusa Portland Cement Paint for the walls. Made by the cement company that first developed and patented cement paint, this superb masonry paint when properly applied is renowned for its beautiful, non-peeling finish. On the concrete floors, apply Medusa Rubber Base Paint, the paint that "bounces off wear" and stays new indefinitely. And above all, use Medusa Waterproofed Cements, gray or white, or Medusa Waterproofing Paste or Powder for all concrete and mortar work. You will be proud of the results. For details on Medusa Products for basements, contact your nearest sales office.
others, it is a synthetic rubber latex. Different latices are available and are selected by the chemist to produce certain performance characteristics. From these latex materials as the major portion of emulsion paint vehicles, paint chemists have developed lines of emulsion paints which have the fast drying of the oleoresinous paints, together with the ability to be applied over surfaces of varying porosity without variation in dry film appearance and sheen. Being rubber-based, they have an alkali resistance far superior to the varnish or alkyl resin-base flat wall paints generally described as oil-type flats. This enables them to be applied directly to unneutralized plaster without the use of special washes and intermediate primers and sealers, and without the danger of the alkali-burning of oil paints. Because of their high molecular weight vehicles, they can be applied over porous surfaces or surfaces with varying porosity and still come up with ghost-free uniform sheen. In addition, latex emulsion paints furnish the excellent washability which the old oleoresinous emulsion paints lacked. Moreover, they offer a high eggshell or satin luster which was heretofore unobtainable in emulsion paints, with any satisfactory degree of uniformity and reproducibility. They are marketed in either paste or ready-mixed form.

However, rubber-base paints are not to be thought of as the final solution to all problems related to flat wall or interior decorating finishes. They have some disadvantages. For instance, a latex paint can’t be applied directly to new woodwork nor can it be used on metal without first painting the metal with a rust preventive primer from the water-thinner of the paint. While it has more sheen than an oil-base paint, the effect of a rubber-base finish is not so rich or handsome. When applied at low temperature (50 degrees) and high humidity, the paint may tend to effloresce—a deposit of sodium sulphate crystals may appear over the wall in patches, giving it a smoky appearance. The adhesion of a latex coating is not as good as an oil or synthetic resin enamel type, and the paint can come off in patches. Since latex paint will rust metal, care must be taken with nail heads. If stored in cold temperatures, the paint may freeze and in thawing lose some of its properties. No adequate body of experience is yet available on what happens when latex coatings are painted over with other types of wall finish.

Some paint manufacturers have preferred not to come on the market with rubber latex emulsion paints. Instead, they have directed their efforts toward organic solvent-thinned instead of water-thinned paint products designed to do virtually all that latex paints will do, and still retain the adhesion and adhesion retention characteristics of alkyl and oleoresinous paint systems. The latest synthetic resinous finishes to be launched on the market at roughly the same level of the latex paints offer comparable washability and uniformity of appearance plus outstanding exterior durability, but with less chemical resistance than the latex paints offer.

Varnishes

Varnish is not just varnish—to be put on everywhere or anywhere. The so-called all-purpose varnishes are at best compromises. Their performance on any given surface can always be exceeded by the use of a varnish designed especially for that job.

A spar varnish is one of high oil and low resin content. It is designed to be flexible, water resistant, and weather resistant. Its particular function is to give maximum protection to surfaces subject to exterior exposure on which a clear coating is wanted. A spar varnish is the wrong type of finish to use indoors. On interior woodwork it will be too soft and on warm humid days may get tacky. On floors, it is not tough enough to give satisfactory wear. On furniture, it would soften under body heat.

An interior varnish has less oil and more resin content than a spar. It is designed for woodwork, but is not hard and tough enough for floors or furniture. If used outside, it would be less durable than a spar.

A floor varnish has higher resin content than interior varnishes. It contains enough oil to give it sufficient flexibility so that it can stand the bumping of hard hitting heels and furniture moving. Its higher resin content gives it the extra toughness needed to withstand the wear and abrasion from heavy foot traffic.

A rubbing varnish, a bar varnish and furniture varnishes are of still higher resin content. They have a high gloss which may be rubbed with pumice and oil to any desired lower lustre. If they are to be used on table tops or bars, they are made with the type of resin which are alcohol resistant.

Flat varnishes are available in any of the above types. The difference is that they contain stearates or silicates or other ingredients which cause them to dry to a lower than normal gloss.
Shellac varnishes are solutions of shellac in alcohol and are classified according to composition and color. The solvent generally used in their manufacture is dehydrated alcohol. They produce a pleasing finish, with a dull lustre, and can be applied easily and dry rapidly. However, they turn white from contact with water and are easily injured.

Varnishes are like any other paint product. You get what you pay for. The best and most economical in the long run is the varnish with higher initial cost.

Certain high-quality varnishes on the market are actually solutions of oil-modified glyceryl phthalate resins. These are clear alkyl resins. As such, they may—for the sake of simplicity—be thought of as varnishes of a special type. Their major use however, is not as varnish in the usual sense, but as vehicles for enamel.

Enamels are designed to dry to a high gloss. Where a semi-gloss enamel is desired the pigment volume is built up with the extender type of pigments to a point where the desired degree of gloss is obtained. The semi-glosses are neither flat nor shiny.

The main difference between an interior enamel and an exterior enamel is to be found in the vehicle. Remembering that an enamel is essentially a pigmented varnish, it will be plainly understood that it would be entirely undesirable to use an interior enamel for exterior use because satisfactory performance could not be expected.

There are important differences, other than differences in the vehicle, between interior and exterior enamels. The pigmentation of exterior enamels is confined to the use of those pigments which give optimum exterior durability, light-fastness, and fade resistance. These features are much less important in interior enamels which are not subject to intense ultraviolet rays. There are certain pigments which give very delicate and beautiful clear-toned finishes. For interior use, they are perfectly satisfactory, but would fail miserably in an exterior enamel.

Within the range of interior enamels, vehicle choice is very important. The best architectural white enamels are made from titanium dioxide pigments dispersed in soybean or castor oil modified glyceryl or pentaerythril phthalate resins, because such vehicles give the maximum non-yellowing of the paint film with age. Such whites are usually blue whites, because—to the human eye—the whitest-appearing white is a blue tint. An absolute white appears to the eye as having a yellow cast. Refrigerators and such other appliances are finished in blue-whites.

There are several types of special interior enamels designed for specific functions beyond the usual interior enamel performance. Among these are rubber-base enamels, used mostly on concrete floors where an alkali condition may be present. Vinyl resin-based enamels are specialized finishes utilized only where their outstanding chemical resistance can be used advantageously. Such applications are more frequently found in industry than in the home.

Floor enamels, designed to have excellent wear and abrasion resistance, are included among enamels because of their high gloss. They are, however, somewhat related to paints with respect to their pigmentation because—to increase their wear resistance—certain low oil absorption extender pigments are used in considerable volume in addition to the prime pigments. The vehicles for floor paints are usually oleoresinous varnishes or alkyl resins. The particular vehicle used is selected for its tough, hard resistance to continued abuse.

Luminosity

Various luminous coatings are available and their use in home building is chiefly in connection with interior

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detail such as marking the edge of a door, light switch, edge of a window sill, or edges of furniture which would be a hazard in the dark. These paints glow for about six to eight hours after they have been "charged" by natural or artificial light, and are easily applied, in at least two coats. New surfaces should be primed and already painted ones should be given an enamel undercoat to seal off any lead in the former paint.

Waterproofing

The common problem of damp basements has naturally brought into the market a great variety of paint products and others which claim to have "waterproofing" qualities when applied to masonry walls. In approaching this whole problem of waterproofing it must be clearly understood that no such coating is of itself a cure-all. Improper drainage of the site, poor workmanship, and defective construction in the building itself can nullify any type of waterproofing.

The so-called waterproof coatings include the four types of masonry paints, described above; colorless surface waterproofings, some of which have a silicone base, some containing chlorinated rubber in solution with benzol or naphtha, and still others being a water emulsion of waxes; cementsitious coatings and proprietary materials (Portland cement and sand, iron dust and sal ammonica, etc.); hot bituminous coatings (asphalt, coal tar, asphalt roof coating, asphalt emulsion, bituminous plastic cement) used on outside walls below grade and also often used on the inside faces of masonry walls.

Tests by the National Bureau of Standards have established that two coats of cement-water paint applied to the exposed faces of masonry walls are highly effective as waterproofing. The coats were found to be less permeable when applied with a stiff brush, and reached a maximum durability when fine sand was added to the paint used for the first coat. Cement-water coatings applied to dry, highly-absorptive walls were more permeable than those applied to damp walls in the Bureau's tests; and coatings of thin consistency were more permeable than those of normal consistency. Mixing the paint with water repellent, hydroscopic salts, diatomaceous silica, or an opaque pigment increased waterproofing.

The Bureau's tests showed that coatings on masonry of oil-base did not increase its effectiveness as a paints and of emulsified resin paints were permeable and much less effective as waterproofings than the cement-water paints. The most effective and durable of the pigmented waterproofings tested were those containing Portland or magnesium oxychloride cement.

The colorless waterproofings were generally found to be ineffective, and permeable walls treated with them leaked excessively. Investigating the waterproofing properties of bituminous coatings applied to the inside faces of walls, the Bureau found these coatings to be of little benefit on walls that leaked badly. Blisters filled with water developed in the coatings, and the rate of leakage from blisters that had collapsed was high. Brush coatings of Portland cement and sand leaked slightly but were more effective for waterproofing inside walls than were bituminous coatings. Trowel coatings of Portland cement mortars, prepared with or without the admixture of iron powder and sal ammoniac, were found to be very resistant to water penetration.

Recommended as a method of waterproofing brick walls without changing their appearance is the repointing of the face joints with mortar. The Bureau found a Portland cement grout applied to the joints of brick walls to be an excellent method of waterproofing. The grout may contain one part of cement to about 1½ parts of fine sand and is applied to the dampened joints with a stiff brush.

SCRUB TESTS with a laboratory machine demonstrate the new standard of washability set by rubber-base water-mixed paints for wall finishes. First panel to right is casein paint after 30 oscillations of one-pound weighted brush. Second example is a resin-oil emulsion coating after 5,000 oscillations. Third, a rubber-base product after 10,000 oscillations. These tests were made on paints aged 30 days, using 0.25 per cent soap solution.

New Jersey Zinc Company photos

PAINTING EXTERIOR SURFACES

When to paint
Preparing surfaces
How woods affect paint
Selecting the right system
Estimating

and many other aspects of successful house painting.

AMERICAN BUILDER
Wallpapers and Fabric Wall Coverings

Wallpaper styling has broken away from the stereotyped floral and geometric patterns of yesterday. The trend is toward papers designed freely to express the character of contemporary architecture and modern home furnishings. This greatly widened choice of papers to suit modern taste is bringing about a revival in the use of wallpaper for every room in the house.

Part of this development is the appearance of papers which have high washability, great decorative value, and perform about as effectively as a good washable paint. One such type is a plastic paper five times stronger than ordinary wallpaper and guaranteed to retain its original color through at least 100 washings. Packaged in a double roll box, it comes pre-trimmed, both sides, ready to hang.

Another type, considerably more expensive, bridges over toward the fabric wall coverings and is classed as "thermoset plastic wall covering." It

(Continued on page 72)
It's so easy, and costs so little, to give greater dimensional stability to doors, windows, flooring and fitted mill work—just one coat of Cuprinol on all sides before you paint.

For Cuprinol so reduces the absorption of moisture by lumber that for all practical purposes wooden construction will not swell, shrink or warp. Cuprinol stops rot and termites, too.

You will appreciate it, your customers will appreciate it, for wood treated with Cuprinol lasts longer, stays stronger.

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WASHABLE WALLPAPERS, produced in attractive designs suitable for modern decorative needs, are available. Is a composite wall covering made by fusing colors, paper and plastic resins, and does not peel or chip. It is described as a stainproof wall and ceiling covering which looks like new even after 25,000 scrubings with soap and water. It resists stains of all kinds, is fade-resistant, resists mold, mildew, and vermin, is fire-resistant, odorless, unaffected by excessive heat or extreme cold, and resists steam, water, and salt water. It comes in roll form and is applied like wallpaper, although a special adhesive is used for better adhesion at tight butt joints and at corners. Each unit is 50 feet long and two feet wide, the equivalent of about three rolls of regular wallpaper.

Included in the washable wall covering category are the fabric wall materials. These are decorative surface materials produced by the application of coatings of paint, plastic and lacquer to a fabric base, usually canvas. The surface is generally hardened by baking processes but remains flexible and is applied like wallpaper. Highly washable, these materials have some structural reinforcement value on both plaster and dry-wall construction. They are especially popular for bathrooms and kitchens because of the washability factor, but are being much used also for interior wall finishing throughout in homes whose partitions are in plasterboard or plywood panels. There are undecorated fabric materials which provide a base for calcimine, water or oil paints, or as a lining for wallpaper. Widths vary from 27” to 48 inches, and lengths from 9 to 33 3/4 feet.

How to Apply

All surfaces should be thoroughly dry and free from cracks, holes, blisters, rough spots, patches or edges. All such defects must be cut, sanded, scraped or properly filled with spackle or plaster of paris. Examine rolls before cutting to required lengths. Brush the strips thoroughly with a good grade of strained flour paste of comparatively thin consistency. Fold strips evenly with pattern side down and trim selvage on the zinc strip of working table with a true straightedge and sharp paper hanger's knife or trimmer. Material without selvage should be similarly trimmed about 3/8-inch on each side.

Immediately after pasting, hang strips plumb with pattern matched. Brush with a stiff short bristle brush, taking care not to stretch the material.

Use only butt seams, and make these by overlapping the preceding strip slightly and sliding off to butt. Seal the seam in position using a broad-knife only and with only minimum pressure. Never use a hard roller.

To clean a surface covered with a washable or fabric material—use a lukewarm solution of mild, neutral soap, applied with clean sponges or soft cloth.

It isn't what you know that is so important—it's knowing WHERE to go to get the information you need to do a job or solve a problem.

Builders and Dealers keep their AMERICAN BUILDER CATALOG-DIRECTORY handy so they can refer to it frequently. Turn to pages D-1 to D-104 in back of book.
RESEARCH in the manufacture of different types of glass as well as research and development in wood, metals, and some plastics has made possible great advances in window construction in the past decade. The double-pane window, the "window wall," the various combination units, the clerestory, jalousie, pivoted, and others are all found in modern design.

Metal Casements

The Aluminum Window Manufacturers Association and the Metal Window Institute have set up specifications for the trade pertaining to aluminum and steel windows, respectively. Steel windows are bonderized and painted with special primer, while aluminum windows are cleaned and coated with clear lacquer by the manufacturer and do not require painting.

Metal windows are made of hot rolled steel or extruded aluminum, mitred at corners, with joints welded. Design features are very similar, and most manufacturers making an "economy" line as well as a regular line. Some metal casements are equipped with crank openers, and some have special hinges so that both sides of the casement may be cleaned from the inside.

Light in weight, metal casements are surprisingly strong, durable, and easy to work with. However, care should be taken in installation to avoid rough handling which might bend slender frames or sash out of shape. Following manufacturer's instructions for installation should result in snug-fitting windows with all screens and storm sash fitting properly and hardware functioning easily.

Wood Casements

The out-swinging type of wood casement is most popular with builders and home owners because apparently it can be more easily made weather-tight. Some types have storm sash which open with the window proper, and others have extra deep rabots to accommodate the ready-made double pane units in common use. As with metal casements, sash are often hinged with offset butts to allow cleaning of both sides from the
WOOD CASEMENTS are easy to install and to make weather-tight. Double-paned glass may be used, and screens and storm sash may be constructed as a part of the sash inside. Screen and storm sash, when available with the unit, are hung on the inside and do not interfere with its operation.

Complete wood window units are easy to install and save the contractor time and money, but care should be taken in installation. These windows need proper openings so that frames set square and plumb. Bowing of head, jambs, and sills should be avoided. Frame and sash should be painted with two coats immediately after installation (or before) but no paint should be allowed on any of the metal weather stripping. Clean up any excess paint or plaster to restore original smooth operation to units which may tend to stick.

**Horizontal Sliding Windows**

The horizontal sliding window came into being when someone turned a double-hung window on its side. Since 1940, the spring-type weather stripping has made possible weather-tight operation. This type of window permits larger glass areas than most other types of movable window, and has increased in popularity because of that fact.

Made of wood, steel, or aluminum, horizontal sliding windows are adaptable to almost any type of architecture or construction, as sizes conform to modular standards for masonry openings, and multiple openings are formed by hooking up single units with side casings. Screens and storm sash are installed on the outside. Double-pane construction is also used.

**Double-Hung Windows**

The double-hung window is probably the most common in American architecture, and modern improvements in weights, balances, and weather stripping have kept these windows competitive with most other types in modern construction.

**Metal Double-Hung**

Metal double-hung windows have the same characteristics of other metal windows; they are weather-stripped at the factory, easy to install, easy to care for and operate. Most are made in box-type sections, with glazing done on the job. Some provide for double glazing. Bonderized steel units require painting, but aluminum does not. However, care must be taken with aluminum to avoid scratches and to avoid stains from plaster droppings which may get onto the sash. A good trick is to coat aluminum sash with petroleum jelly right after it is put in place.

Manufacturers offer a great range of opening sizes, installation hardware and special features. Even though these are fundamentally similar, their slight variations make it imperative to decide on brand and sizes to be used before construction is begun on outside walls, and to follow closely manufacturers' instructions as to installation.

**Wood Double-Hung**

Modern methods which produce factory-assembled complete units have resulted in substantial savings in building costs as against the old-fashioned windows built on the site. Weather strip is placed in the assembled frame, and balances are hooked up ready to operate. Weights and pulleys are now used in only the "economy" types, and complete units are delivered to the building site ready for installation.

The National Woodwork Manufacturers Association has established standards and specifications for the trade, and opening sizes are set up to conform to modular principles. Weather stripping has advanced to the point where some manufacturers are using tension-type weather strip to hold the window in any position and eliminate the need for balances of any kind. This also allows for easy removal of the window for cleaning and painting without removing any interior frame stops.

Ponderosa pine modular windows have all the natural insulating advantages of wood, hold paint or other finishes well, and can be treated with preservatives at the factory to prevent decay or insect attack. The removable feature of those using spring weather stripping operates by pushing the sash to one side against spring pressure so that the other side is free and pulls inward. Paint-stuck windows may be freed in the same manner. Such tension-types may also be turned on their side to use as economical sliding windows instead of using regular sliding windows which require more expensive and elaborate tracks to run on.

**Awning Types**

The awning-type of window, wood or metal, is basically a casement window turned on its side with the hinge at the top. Wood awning windows usually have sash or vents hung from the top and hinged by brackets to the jamb. The bottom rail of one unit interlocks with the top rail of the one below. The sash are usually controlled by worm or gear mechanisms, and good ventilation is possible, as most units may be opened to 90 degrees. In many types units may be left open without danger of rain driving in.
Most awning units, either wood or metal, are delivered to the site as complete packages, ready for installation. Installation is the same in most cases as for other types of window units, the same precaution for metal units being necessary as for metal casement or double-hung types. Weather stripping and interior storm sash and screens make them feasible for use in any climate.

Some units have motor-driven operators. Most of them permit the bottom vent to be open a crack without the others being open at all, and allow the top unit to drop inside for easy cleaning of the remainder from inside the room. Both wood and metal are available in a complete range of sizes.

Walls of Glass

The modern trend is definitely toward the use of larger glass areas in home construction. Picture windows have grown to be whole walls of glass, and two of the nation's largest glass manufacturers are making available a double-pane unit which reduces heat loss or gain from windows and makes the glass wall truly practical.

Glass block is frequently used with picture windows, a common application being a plate glass or double-pane picture window flanked on each side with sections of glass block into which is built a ventilating louver unit.

Plate glass is frequently used where problems of insulation and heat loss are not acute, but the double-pane unit is becoming ever more popular in the “window wall” type of construction. This double pane typically consists of two pieces of good quality plate glass mounted in rubber with an air space of 1/4 inch or so between. This provides insulation and reduces the condensation which usually occurs on glass in cold climates. Triple glass units are also available, when heavy insulation is desired.

WOOD DOUBLE-HUNG sash have high insulating value, and modern weather strips eliminate sash balances in some lines. Spring weather strips permit easy removal of sash for cleaning or painting.

DOUBLE-HUNG aluminum windows are weather-stripped at the factory and do not require painting. Care should be taken to prevent scratching or staining during construction.

AWNING WINDOWS supplement architectural treatment where horizontal lines are wanted. Good ventilation is possible; wood and metal units are supplied in a variety of sizes.

Most sash manufacturers provide for the use of this glass with their units, and installation of this type is no more complicated than for ordinary glass. In addition, double-pane construction usually eliminates the need for storm sash.

The problem of securing ventilation while at the same time having a large expanse of glass is usually met by making the glass area of smaller lights or units, with some of them permanently fixed and others opening, as awning or casement types. In some cases a group of double-hung windows located immediately adjacent to each other will produce the same effect. For large panes of glass, many builders have found the horizontal sliding construction most suitable where the “glass wall” effect is desired.

Pivoted and Projected Types

Included in this category are awning windows with a hopper vent at the bottom which swings inward instead of outward; the heavy projected units; and the semi-protective pivoted types. With pivoted vents, the unit swings horizontally at the center instead of at the top, as in awning types, so that the vent projects outward and also inward at the same time. This allows windows to be kept open during rains; the projecting portion keeps the rain out, while the inner portion acts as a baffle to deflect air towards the ceiling. Units are available in wood, steel, solid
WINDOW WALLS using a combination of hinged sash and glass set in stops may be purchased as a stock unit in various sizes. Double pane construction reduces heat loss.

bronze, or aluminum. They come with standard hardware and may be fitted with screens and in some cases with storm sash, particularly on the opening-out vents.

Combination Units

Combination screen and storm sash are available from a host of manufacturers, and are made in wood, aluminum, stainless steel, and other materials. Screens are furnished either full length or in half-length sections, wired with copper or aluminum cloth. Storm sash usually comes in two sections, making the combination unit a three-piece affair.

One manufacturer lists 20 stock sizes, and others make many more, as well as fabricating such units to order to fit existing windows of almost any structure. Metal units are sometimes built with a wood subframe, with steel or aluminum parts carefully finished and joined to the subframe.

Some manufacturers are producing what amounts to triple-hung units, which have a standard double-hung window plus a double-hung storm sash plus a one-half screen unit—all built into the same prefabricated frame, complete with weather stripping and balances, or pressure weather stripping for easy removal and cleaning of the sections. Ready for installation at time of construction, these units simplify matters a great deal for the builder.

Storm sash for casement and the awning-type windows, as well as screens, are devised for handling and installation on the inside of the window. Rubber or other weather seal is usually provided around the edges, and storm sash frequently comes with built-in ventilator lights so that winter ventilation may be controlled as desired.

Basement and Utility Windows

Wood or metal basement and utility window units, set up and ready to install, come with or without storm sash and screen, and are normally provided with frames, hardware and accessories in one package from the manufacturer. Frames are grooved to hold mortar, and wood units are chemically treated to resist rot and insects. Screen and storm sash are fitted to fasten from the inside.

One type of basement window is fitted with reversible sash which may be hung to open either at top or bottom. Removable sash may be reversed in a matter of seconds. Utility window units are made to fit modular principles, come already glazed, with top vent opening inward; an outer screen across this opening is built in to keep out insects and vermin. All units are easy to operate, lock securely, and have few moving parts to get out of order. They are ideal for barns, farm and storage buildings.

Special Types

There are many and varied special types of windows available both as standard units and as custom-made installations. Among them are the electrically-operated picture windows which are hung from a metal screen which rolls up at the top. As the screen unrolls, the window drops down into a slot and the screen covers the opening. These motor-driven units come complete in a package, ready for installation.

Another special type is a modification of the simple utility window, and is a bottom-hinged panel opening inward with screening across the opening. The entire unit is in a metal frame ready for installation in a glass block wall. Modular units are available.

Louvered window units for use with picture windows can be obtained in wood or metal. These are strictly ventilating devices, can be closed and made weather-tight. Other types of jalousie windows, with horizontal strips of glass, are rated as weather-tight and provide controlled ventilation as well. Glass jalousies are frequently installed in door panels.

Another manufacturer produces a louvre-type shade screening of metal with the louvres set close enough to keep out pests and insects but far enough apart to provide ventilation and shade. This also affords privacy, as you can see out but people on the outside cannot see in.

Tension screens are another recent development which housewives have found convenient, especially

(Continued on page 80)
This "silent salesman" SURE SELLS HOUSES

customers WANT Quality Approved ALUMINUM WINDOWS

You don't need a lot of fast sales talk when your houses have windows that carry the "Quality-Approved" seal.

The attractive, smart appearance of aluminum windows brings prospects in. The "Quality-Approved" seal tells them that your house is as good as it looks. It's the buyer's assurance of lifetime trouble-free window service—for "Quality-Approved" windows never rot, rust, warp; always open and close freely; never need paint.

The "Quality-Approved" seal is your assurance of windows that meet the highest quality standards of design, construction, materials and low air infiltration. The windows are easy to handle and install; they save you money on installation; help you sell your houses faster and free you from the trouble and expense of complaints and call-backs.

You can get early delivery of standard sizes in any style—double-hung, casement, projected, awning. For detailed information, see any "Quality-Approved" manufacturer, consult Sweet's Builder's File (Section 4c ALU) or write Dept. AB-4.

Aluminum Window Manufacturers Association
74 Trinity Place, New York 6, N.Y.
BEE GEE Modern All-Wood Windows are finding more and more favor with customers everywhere. They're light and airy... with the styling particular people want. The modern BEE GEE Window is a complete unit consisting of FRAME, pre-fit glazed SASH with the glass bedded in putty, a bronze SCREEN and all HARDWARE installed at the factory. The more than 42 styles and sizes are shipped ready to set in the wall.

FRAME DETAILS

- For brick or stone veneer studwall or solid masonry wall construction

<table>
<thead>
<tr>
<th>Frame Number</th>
<th>Brick Opn.</th>
<th>Stud Opn.</th>
<th>Sash Size</th>
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<td>3'-0&quot;</td>
<td>1'-111/16&quot;</td>
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<td>108</td>
<td>3'-3&quot;</td>
<td>3'-0&quot;</td>
<td>1'-111/16&quot;</td>
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<td>238</td>
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STANDARD BEE GEE WINDOWS STYLE "B"

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<tr>
<td>438</td>
<td>3'-0&quot;</td>
<td>3'-0&quot;</td>
<td>2'-9&quot;</td>
</tr>
</tbody>
</table>

*Plaster Reveal available also in Stud Wall and Solid Masonry Frames.
CLEAN THE OUTSIDE FROM THE INSIDE

Housewives immediately sense the convenience of this famous Bee Gee feature. Bee Gee Windows meet the needs of every home, fit every budget... a source of lasting pride and satisfaction. At your request the 20 sizes of Bee Gee Picture Windows can be shipped completely glazed with either Thermopane or Twindow.

HOW TO ORDER Bee Gee WINDOWS

1. State the quantity needed, the unit number, and the type of frame construction desired, such as "Studwall, Solid Masonry, or Brick Veneer."

2. If narrow jambs are needed for Plaster Reveals, just state "Plaster Reveal" with your frame construction.

3. Standard jambs are 1½" x 5½". Narrow jambs down to 3½" wide are available for Plaster Reveals on inside, or where wall construction necessitates less than 5½" wide, without extra cost.

4. Clear glass always shipped unless "Obscure" is specified.

5. When marble stools of more than ¾" thickness are to be used, it is only necessary to specify "For Marble Stools" and a frame for this type of stool will be furnished at no extra cost.

6. Frames for bay windows or corner windows with extended sills for mitering will be furnished if requirements are specified on order, at a slightly higher price.

7. Frames for all sizes are available for Studwall, Brick, or Stone Veneer, and for Solid Masonry Walls.

SOLD BY YOUR LUMBER DEALER

BROWN-GRAVES CO.
Akron 1, Ohio

April 1952
when it comes to cleaning windows. Screens snap into place from the inside, roll up for storage and are easily manipulated.

**Wood Doors**

Wood doors are made of many species, including softwoods, hardwoods, plywood, fir, Ponderosa pine, and in a variety of types of construction including flush, paneled, and in combination with glass inserts or panels.

Exterior doors for both home and commercial entrances are frequently heavier and more ornate than many interior doors. Both Ponderosa pine and Douglas fir doors come in a wide variety of sizes and designs, for both interior and exterior applications. The Fir Door Institute has set standards and specifications for the trade in the fir door group, and doors are manufactured to close standards for alignment, balance, and function.

Popular among more recent developments has been the hollow core flush door made up of interior sections in grid or arch or ribbed form with an outer layer of plywood or other laminated material. The engineered interior construction is said to give such doors unusual strength and rigidity, while the exterior finishes are usually very fine and susceptible of adaptation to many types of interior design.

Attractive designs and finishes may be obtained from using such woods as red oak, white oak, white gum, gum, red gum, black walnut, or mahogany, to mention a few of the possibilities.

A substantial number of wood doors have been made with fireproofing treatment, the wood being impregnated with fire-resistant chemicals. This increases the weight of the doors about 30 per cent, and several such doors have been made to pass the one-hour fire exposure test of the underwriters' laboratories.

**Metal Doors**

Metal doors of steel, bronze, aluminum, and a wide range of alloys are available in models which fit into both exterior and interior design. Hollow metal doors are easy to install, cannot sag, splinter, warp, or swell, and will give good performance for long periods of time.

Installation of metal doors is easy, as most manufacturers have already taken care of mortising, drilling, tapping, and prime painting. Cutting and fitting jambs, stops, and trim is eliminated. Frame and door need no mortising for hinges, locks and strikes. The net result is substantial time saved in installation.

Other types include metal-covered and tubular construction, and many metal doors are used in combination with large glass areas. Many manufacturers furnish sliding as well as conventional types of metal doors, and most of these doors come complete with frame and instructions for installation. As with metal windows, certain precautions must be taken to avoid scratches, to use a second coat of paint on steel doors and frames (unless a baked-on synthetic paint is used) and to avoid staining the metal with plaster droppings or other material.

**Glass Doors**

Glass doors for both exterior and interior applications follow the trend in modern design toward the use of larger glass areas in walls of both commercial and residential buildings. In commercial buildings, glass doors have come into common use for stores. In residential buildings, glass doors are useful as a design feature creating a spacious appearance while affording separation; for example, keeping kitchen odors from the rest of the house, or preventing the colder air in enclosed porch from entering the rest of the living space.

Some glass door installations utilize stainless steel frames and fittings, but must use aluminum extrusions reinforced with structural steel. Because of the relatively great weight of these doors, special care must be

(Continued from page 76)

**Stainless Steel Ventilating Windows**

for glass block openings have heads and jambs of heavy construction to support load. Rigid construction minimizes glass breakages, and metal to metal sealing insures tightness

(Continued on page 84)
THIS UNIQUE CORE PREVENTS WARPING IN MENGEL HOLLOW-CORE FLUSH DOORS

Mengel Hollow-Core Flush Doors stay flat. Mengel’s exclusive, Insulok core is just one of the important “reasons why”. This patented interlocking grid has no directional “grain”, provides a rigid, neutral core. Each strip is ⅛” wide, and the strips are only 1” apart. This closely-spaced grid provides greater bonding surface than is found in any competitive hollow-core door — helps give Mengel Doors unmatched strength and resistance to warping...

Mengel Flush Doors have genuine hardwood stiles, rails, lock blocks, cross-banding and faces. They are the finest that can be built. They are fully guaranteed without limitation as to time — yet sell for little more than softwood doors.

STANDARDOR

Ask about Mengel’s popular new economy door, Standardor. Made by the same craftsmen as the famous Mengel Door, yet simplified for large volume production bringing substantial cost-savings to you!
TRUSCON RESIDENTIAL
DOUBLE-HUNG
STEEL WINDOWS
Smart...Strong...Economical

The excellent design of these popular windows makes them adaptable to all types of home architecture, from extreme modern to early provincial. The construction is extremely rugged, assuring long service. The slender frame and muntin bars permit the entry of the maximum of light, and assure a more pleasant view through the windows.

Truscon Double-Hung Steel Windows cost no more to buy and install than ordinary windows. Completely factory assembled and equipped throughout with stainless steel weatherstripping, they are delivered ready for installation. Their cost will fit the budgets of the most modestly priced homes. They can be economically installed. And, considering their long life, they actually cost LESS.

Combination Screen and Storm Sash Available at Reasonable Prices.

<table>
<thead>
<tr>
<th>TYPES AND SIZES</th>
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<tr>
<th>&quot;B&quot; TYPES</th>
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<tr>
<td>GLASS Size</td>
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<th>&quot;E&quot; TYPES</th>
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<td>GLASS Size</td>
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<tr>
<td>36&quot; x 48&quot;</td>
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<td>36&quot; x 52&quot;</td>
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</table>

The twelve years of experience which architects, builders and owners have had with this window in all climatic locations, on installations in numerous small homes, apartment houses, dormitories, low-cost housing projects, and hotels, authoritatively confirms its superlative performance ability.
TRUSCON RESIDENTIAL
STEEL CASEMENTS
Graceful..Distinctive..Popular

These are the most aristocratic of all windows for the home, yet their adaptability permits them to be designed into architecture of any type. Their slender, graceful lines permit the entry of maximum light. Their wide swinging vents; pleasing glass panels; easy operation; and beautiful appearance appeal to home builders in every budget class.

In rooms where windows are opened and closed frequently or where ventilation requirements are great and varied, Truscon Residential Steel Casements fill a utilitarian need in addition to being highly decorative. Side hinged casements can be so opened that they invite or retard the inward flow of air. High, small or unusually placed window openings all become more useful and attractive when fitted with Steel Casements.

Screens and Storm Sash Available at Reasonable Prices.

Truscon Residential Casements are equipped with Roto or Lever Operators which open or close the ventilators without the necessity of moving the screen. The ventilators are held securely in any open position. The concealed-latch locking handles provide positive action, drawing the ventilators tightly closed and weather tight. In ventilated units, all glass can be washed from the interior side.

TYPES AND SIZES

- Picture Window Units
- Glass Glazed Types for Use with Single Glass
- Minimum Glass Thickness

Truscon Residential Steel Casements harmonize with any type of architecture.

Attractive room settings and picture windows are possible with Truscon Steel Casements.
**POPULAR PATTERNS FOR INTERIOR DOORS**

<table>
<thead>
<tr>
<th>Popular Sizes</th>
<th>(1'6'' \times 6'6'')</th>
<th>(2'0'' \times 6'8'')</th>
<th>(2'4'' \times 6'8'')</th>
<th>(2'6'' \times 6'8'')</th>
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<td>N.D. 106</td>
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<td>FOUR PANEL</td>
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<td>FOUR PANEL</td>
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<tr>
<td>N.D. 107</td>
<td>FIVE CROSS PANEL</td>
<td>FIVE CROSS PANEL</td>
<td>FIVE CROSS PANEL</td>
<td>FIVE CROSS PANEL</td>
<td>FIVE CROSS PANEL</td>
</tr>
</tbody>
</table>

**Diagram**

- N.D. 101: Inner Frame
- N.D. 102: Two Panel
- N.D. 99: Three Panel
- N.D. 100: One Panel
- N.D. 108: Six Panel
- N.D. 111: Eight Panel
- N.D. 106: Four Panel
- N.D. 107: Five Cross Panel

---

**GLASS DOORS** for stores and public buildings readily combine with other treatments in the modern manner.

**JALOUSIES PROVIDE** protection from sun and rain and also give ventilation.

**Combination Doors**

In addition to doors which combine wood and metal, wood and glass, metal and glass in various ways, a number of manufacturers who produce combination screen and storm sash also produce combination screen and storm doors. Door and insert units are available both in wood and metal, in a wide range of stock sizes. They come equipped with interchangeable inserts for screening or storm glass.

**Cabinet and Cupboard Doors**

Cabinets and cupboards offer an opportunity for the builder who operates his own millwork department. He can fabricate suitable cabinet units ready for installation. There are, however, a large number of companies which provide a full range of metal and wood doors, both of the hinged and sliding types, for cabinet and cupboard applications.

Sliding doors for wardrobe cabinets have become increasingly popular.

(Continued on page 86)
New SOLID Success!

SLI-D-O-O-RS

Sensational, New Sliding Doors

They're Solid...
Made of United States Plywood Corporation's Amazing, New NOVOPLY.

Constructed with United States Plywood Corporation's amazing NOVOPLY, SLI-D-O-O-RS are guaranteed not to warp. They are solid throughout and slide silently on precision-engineered, ball-bearing rollers.

From every point of view, SLI-D-O-O-RS offer every advantage...

- Adjustment and construction procedures have been reduced to the simplest minimum.
- SLI-D-O-O-RS are a combination of NOVOPLY and hardwood jambs, headers and saddle for completely warp-proof, easy operating, sliding action. Oak saddle blends with finished hardwood floor.
- SLI-D-O-O-RS are supplied with fascia so that only the handsome sliding doors are visible.
- NOVOPLY takes paint beautifully. It will not bleed or produce an unsightly "orange peel" effect.
- Priced right for builder and customer.
- When properly adjusted, rear slide guides permit removal of door or fasten securely to prevent door from falling from casing. Doors are as attractive from the back as from the front.

Write for complete, informative folder.

DIMENSIONS:

Two Door Openings . . .
Outside jamb to outside jamb: 2'0", 2'6", 3'0", 3'6", 4'0", 5'0", 6'0", 7'0", 8'0".
Outside header to outside saddle: 6'9½" or 8'0".

Three Door Openings . . .
Outside jamb to outside jamb: 6'0", 7'6", 9'0", 10'6", 12'0".
Outside header to outside saddle: 6'9½" or 8'0".

Special sizes will be made to order if quantities warrant it.

© Trade Mark Registered—Patented Other Patents Pending.

SPECIAL SIZES WILL BE MADE TO ORDER IF QUANTITIES WARRANT IT.

APRIL 1952
**POPULAR MODULAR SIZES OF WOOD WINDOWS**

**OPENING SIZES**

(Note: Windows are made narrower and shorter than window opening sizes shown below)

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**GLASS SIZES—1 3/16" CHECK RAIL WINDOWS**

(FLEXIBLE DOORS and room dividers are used like standard doors. No trim is needed. Usually they hang from ceiling track. They operate easily, and add a note of vertical corrugation which works into other design elements in the room in a pleasing manner. Builders estimate that folding doors take from 20 to 50 per cent of the space needed by ordinary doors. Fire-resistant doors for special purposes in small commercial buildings are also found useful in home construction in the custom-built field. These may be of metal or metal-covered wood, and in some instances are of chemically-treated wood. Various manufacturers provide a wide range of models and sizes which have passed the underwriters' one-hour fire-rating test. **Roll-Up Doors**

Rolling doors for garage entrances or service entrances include roll-up (Continued on page 92)

(Continued from page 84)
The internal construction of

ATLAS FLUSH DOORS

means

lasting beauty and

lasting strength

The exterior beauty of an Atlas Flush Door rests not alone on the simplicity of its lines and the superior quality of its surface panels... Its engineered, internal construction is a major factor that assures permanently fine appearance.

Whatever you choose for surface panels—Northern Hardwoods, Southern Gum, Western Fir or rarer imported woods: Avodire, Mahogany, Prima Vera and the like—the principles of construction remain the same.

There is an Atlas Flush Door to fit every architectural scheme and every budget. If the door is to be painted, less expensive paint grade veneers are available. Similarly, stains on gum offer a choice of Mahogany, Walnut and other "furniture" finishes—with economy.

Every Atlas Flush Door is the product of a single, wholly integrated organization. From standing tree to completed door, there is one standard of control and inspection—one responsibility. We'd like you to know more about Atlas Hollow Core and Solid Core Flush Doors. For illustrated literature, kindly address your request to Department 62.

The core material of the Atlas Solid Core Flush Door is Balsa Wood—inert, proof against stress and warpage. With the same K factor as cork, Balsa has important sound-deadening qualities. Its low thermal conductivity means efficient insulation. Its light weight means light weight for the finished door. The core blocks are positioned within a kiln-dried frame. Lock blocks on both sides permit the door to be hung from either right or left.

HOLLOW CORE

In the Atlas Hollow Core Flush Door, kiln-dried soft wood struts—running both laterally and perpendicularly—interlock to form a grid. Wherever two struts interlock, the outer corners are beveled to permit free air circulation. The carefully machined frames are of kiln-dried White Fir or Ponderosa Pine. Lock blocks on each side permit hanging from either right or left. Before the surface panels are bonded to core and frame, the interior surfaces have been completely sized, to counter-balance the pull of the final exterior finish.
ANDERSEN GLIDING WINDOW UNITS: Sash slide from side to side in plastic sill tracks. Sash can be removed. Fully weather-stripped. Single light or horizontal glazing. Equipped with screen and double glazing.

ANDERSEN BASEMENT-UTILITY WINDOW UNITS

Packed in cartons, completely set up for quick installation. Includes screen. Storm sash optional. Modular sizes.

REVERSIBLE SASH

Ingenious hardware permits hinging of sash at top or bottom. Removable sash can be reversed in a matter of seconds.

MANY ABOVE-GROUND USES

In stack or ribbon groupings, or singly, this Andersen unit has many above-ground uses. Ideal for cabins, garages, farm and commercial buildings.

- Specification data on Andersen Windowalls is in Sweet's Architectural and Builders' Catalogs or will be sent by us upon request. See your local lumber or millwork dealer for further information.
NEW WIDER SASH

Andersen Casements are now available in two sash widths, 18 inches and 22 1/2 inches. The illustration above shows the 18 inch sash.

Andersen Pressure Seal Window Units: This double-hung window unit is the newest style in window manufacture. Invisible pressure strips eliminate all weights and balances and force sash against parting stop to close all cracks. Sash float freely in runners, and are instantly removable. Easy to install. Completely weather-tight.

Andersen Casement Window Units: Wide variety of sizes, including picture window combinations. Outswinging sash. Comes complete with hardware, weatherstripping, and inside screen and double glazing. One-light, horizontal or cut-up glazing.

Andersen Windowwalls are complete window units... precision manufactured from beautiful, insulating wood. See your local millwork dealer or write us for more information.

Andersen Corporation • Window Specialists • Bayport, Minnesota
TRUSCON RESIDENTIAL
INTERIOR STEEL DOORS
SWING DOORS AND FRAMES - SERIES 50

Smart... Rigid... Permanent

Truscon Series 50 Steel Doors and Frames are designed to meet interior requirements for all types of residential structures. Precision engineered and manufactured of high quality steel, these doors and frames ensure perfect fit and permanent trouble-free operation. Most popular sizes of doors and frames are available for prompt delivery from strategically located warehouses.

Designed to compete in cost with doors of any other material, low cost is achieved through the economies of mass production. Additional construction savings are made possible by ease and speed of installation which can be accomplished in less than one third of the time required for "on the job assembled" types.

Doors are 1 1/2" thick and of a pleasing, flush design. They are available in the standard height of 6'-8", and with the five most popular widths, 2'-0", 2'-4", 2'-6", 2'-8", and 3'-0", being stocked in warehouses. Special widths and heights can be furnished on request. Four types of locksets, designed to meet all normal requirements of residential doors, are offered. They are either Schlage Type "A" or Lockwood Type SB with both of bright brass material.

Frames for the doors are designed to fit practically every type of wall construction. Shipped knocked down, they are easily and quickly assembled with the corner connections forming neat hairline joints. Frames are available in depths of 2-3/4", 3-3/4", 4-1/8", 5-1/4" and 6-1/4", with the last two depths procurable from warehouses in the stock door sizes mentioned above.

Doors shipped from warehouse stocks are packaged in sturdy cartons for protection during shipment. Each door leaf is designed for use in either right or left hand swing, and to open in or out. Frames, however, must be ordered right or left hand to accommodate required swing of door and are bundled for shipment.

Underwriters' Labeled Doors and Frames are available on special order. Consult the nearest Truscon representative for detailed information.

**FRAME DETAILS**

- **ANCHORS**
  - **WELDED STUD ANCHOR**
  - **ADJUSTABLE MASONRY ANCHOR**
  - **ADJUSTABLE FLOOR ANCHOR TO FINISHED FLOOR**

**HAND OF DOOR MAY BE DETERMINED BY REFERRING TO SKETCHES BELOW. NOTE THAT DOOR MUST ALWAYS SWING AWAY FROM POINT VIEWED.**

**FRAME DETAILS**

- 2-1/4" & 3-1/4" FRAMES
  - Frames are formed from 16 ga. steel. All others are 18 ga. stock. Warehouse stock frames are 5" and 6-1/4" depths.

- 4-1/4", 5-1/4", & 6-1/4" FRAMES
  - This dimension is 1/4" for 2-1/4" frame.

- DOOR OPENING DIM.

**ANCHORS**

- TAPS TO BE BENT INTO PLACE IN FIELD

**ADJUSTABLE FLOOR ANCHOR TO FINISHED FLOOR**

- Jamb and head members assembled. The two tenons best in place, securely locking the joint.

**UNDERWRIGHT STEEL COMPANY: 1030 ALBERT STREET - YOUNGSTOWN, OHIO
Sales Offices and Warehouses in Principal Cities + Subsidiary of Republic Steel Corporation**
TRUSCON RESIDENTIAL
STEEL DOORS

SLIDING CLOSET DOORS - SERIES 51 AND 51B

These modern Sliding Doors provide total closet accessibility, more usable floor space and materially reduce construction costs. Outstanding economy is obtained through the elimination of material and labor required, (1) to construct and plaster approximately one half the area occupied by the full width of the Sliding Door opening, and (2) to furnish and install frame, swing door and hardware.

Series 51 and 51B Flush Type Sliding Closet Doors are precision made of prime quality cold rolled sheets heavily reinforced for rigidity, thus insuring perfect fit and permanent trouble-free operation. Each door is equipped with two ball bearing rollers, dense felt top guides and rubber bumpers at jambs to provide smooth, quiet operation.

Finger pulls of brass are fitted into each side of both panels at the factory. Units are available in four standard widths, 3'-0", 4'-0", 5'-0" and 6'-0". Height of all doors is 6'-8".

Two sizes carried in stock:
4'-0"x 6'-73/4" and 5'-0"x 6'-73/4".

STEEL FRAME ALSO AVAILABLE ON SPECIAL ORDER

VERTICAL SECTION
EXPLODED VIEW OF DOOR AND GUIDES

TRUSCON STEEL COMPANY • 1050 ALBERT STREET • YOUNGSTOWN 1, OHIO
Sales Offices and Warehouses in Principal Cities • Subsidiary of Republic Steel Corporation
WOOD CASEMENT
WINDOWS

MAKE CUSTOM WINDOW EFFECTS FROM STOCK-SIZE UNITS

Pella stock-size casement units can be combined into hundreds of custom-like effects of varying width and height. Installation cost is minimized because Pella wood casements are factory-fitted and assembled, individually packaged, ready to place in rough wall openings.

CHECK THESE CONVENIENT Pella FEATURES

ROLScreens — Pella casements are equipped with inconspicuous inside Rolscreens that roll up and down like window shades. Rolscreens operate with finger-tip ease. Never need painting, storing, putting up or taking down.

Dual glazing and Weatherstripping — All Pella casements are dual glazed to insulate against winter cold and summer heat. Sash is weatherstripped on all four sides to eliminate drafts.

Easy to Operate — Pella’s patented hinge design and construction assure easy operation.

Fit all Types of Architecture — Pella casements fit snugly into wood, frame, brick stone, brick veneer, etc. They convey dignity and stateliness to Colonial architecture . . . emphasize Cape Cod “coziness” . . . lend breadth to Modern or Ranch styles.

3-Light Wide Unit — Only Pella builds these wide casement units, made possible through Pella’s patented hinge design, superior sash construction and steel inner frame. Ventilating windows have glass sizes up to 24” wide by 60” high!

FOR FURTHER INFORMATION
See Sweet’s Builder’s File 17¢. ROL or mail the coupon today for a complete set of Casement Details No. 1050M.

ROLScreen Company, Dept. D-27, Pella, Iowa
Without obligation, send me “PELLA CASEMENT Installation Instructions in Full Size Casement Details No. 1050M.”

Name

Firm

Address

City State

PELLA CASEMENTS + ROLSCREENS + VENETIAN BLINDS

GLASS SLIDING DOORS facilitate gardening for this homeowner. Similar applications are useful for porches and solariums

(Continued from page 86)
type of grilles used also in porch and patio treatments in modern home construction. Rolling doors are neat in appearance, easy to operate, save space, give weather protection, burglary protection, and fire protection if treated with fire-resistant material. They can be operated automatically if desired.

Modern revolving doors are almost universally installed of glass and metal construction in modern small commercial buildings. Advantages of revolving doors are said by manufacturers to include traffic control, air control, savings on fuel bills, increased store profits from added floor space, and automatic collapsing features for emergency operation. Revolving units operating on similar (Continued on page 96)

Two Views of revolving unit used in small home closet construction. All stored material is easily reached.
FOR BRICK, BRICK VENEER
CEMENT BLOCK or STUCCO

ALWINTITE
HORIZONTAL Sliding WINDOWS
with universal FIN-TRIM

Save installation time Reduce materials' cost
Eliminate need for wood frame

HIT of the Chicago builders show, ALWINTITE sliding windows with FIN-TRIM are the rave of builders everywhere.

With the new universal FIN-TRIM you can build in your sliding windows as you go along. No longer is it necessary to first install a wood buck to hold the window. Now your windows can be nailed in place, in frame construction, with any exterior finish—can be built in position in cement block or brick construction.

Think what this means in terms of quicker installations, reduced labor, lower costs. When you order your sliding windows with the new FIN-TRIM, there are no accessories to bother with, no special frames, no exterior wood trim or casing to buy, apply or paint. You won’t have to paint around the outside of the windows, no matter what kind of finish you use. And what’s more, you have a window that’s flashed all around—one that gives a weathertight installation.

ALWINTITE sliding windows are the lowest priced aluminum windows on the market today—a “must” for every builder interested in keeping costs down with sales appeal high. Investigate now. Ask your local ALWINTITE dealer today or write for complete details to Dept. AB-4.

ALWINTITE DIVISION
GENERAL BRONZE
CORPORATION
Stewart Avenue • Garden City, N. Y.
DOUBLE-HUNG WINDOWS • SLIDING WINDOWS • VIEWALL WINDOWS
TRIPLE CHANNEL COMBINATION STORM WINDOWS AND SCREENS
Builders say: **TENSION-tite**

**window screens pay off**

*Trade Mark*

Preferred by home-owners

--- yet it’s the **lowest cost**

screen to install!

- All aluminum! Rust-proof!
- Attractive — Non-staining
- No painting---No fitting
- Sizes for all d. h. wood windows

- **Exclusive GUIDE BAR**
  Speeds Installation

★**Immediate delivery★**

**NO USE RESTRICTION**

UNDER NPA-M-4A

Also available with Kaiser SHADE screening

TENSION-tite shade screens keep out the direct rays of the sun as well as insects. Use these screens on south and west windows to make the hottest rooms the coolest.

**RUDIGER - LANG CO.**

Factories in Berkeley, Calif., and Toccoa, Ga.

2701 EIGHTH STREET, BERKELEY 10, CALIFORNIA

P. O. BOX 468, TOCCOA, GEORGIA
These Superior Features make

**Roddiscraft FLUSH DOORS**

EASIER TO SELL - BUILD LASTING CUSTOMER SATISFACTION

FOR OFFICE BUILDINGS, SCHOOLS, HOSPITALS, HOTELS, INSTITUTIONS, APARTMENT HOUSES

FOR RESIDENCES, MULTIPLE DWELLINGS AND OTHER INSTALLATIONS

---

**RODDIS CRAFT SOLID CORE Flush Doors**

- **FIRE RESISTANT** — exceed the 30 minute fire test. Provide extra protection where needed in multiple and single dwelling units.
- **SOUND RESISTANT** — develop an average sound transmission loss of 30.9 decibels — only a little less than specially constructed sound retardant doors of much greater cost.
- **RESISTANT TO ABUSE** — core, crossbands and face veneers welded into a single unit with the inherent strength of true plywood construction.
- **WATERPROOF** — for exterior and interior use. Phenolic resin glue provides two completely waterproof shields over entire area of the door on each side of the core.
- **STANDARD THICKNESS FACE VENEERS** — provide greatest resistance to checking and abuse — permit better matching.

---

**RODDIS CRAFT Housemart Hollow Core Doors**

- **7-Ply construction** — 3-ply face panel bonded to both sides of the core assembly — offers these added advantages:
  1. **Extra strength**
  2. **Greater resistance to distortion**
  3. **Sure protection against core pattern showing through face veneers after finish is applied**

Roddiscraft Housemart Hollow Core doors are generously made — contain ample wood at side and top and bottom edges for trimming and the safe anchoring of hardware. Lock blocks on both sides offer a wide choice of hanging positions.

There is a Roddiscraft Door to meet every specification calling for wood doors. Call your Roddiscraft dealer for complete information.

---

**NATIONWIDE Roddiscraft WAREHOUSE SERVICE**

- **Cambridge** 39, Mass. 229 Vesper St.
- **Charlotte** 6, N. C. 132 E. 27th St.
- **Chicago** 22, Ill. 3045 W. 41st St.
- **Cincinnati** 7, Ohio 626 Davenport St.
- **Dallas** 10, Texas 2202 Main St.
- **Denver** 14, Colo. 11551 Jefferson St.
- **Huntington** 10, Texas 2410 Schönke St.
- **Kansas City** 3, Kan. 33 South-west Blvd.
- **Los Angeles** 58, Calif. 20101 Vernon Ave.
- **Louisville** 10, Ky. 1200 E. 15th St.
- **Marshfield** 15, Wis. 313 S. Poindexter St.
- **Milwaukee** 8, Wis. 4101 W. State St.
- **New Hyde Park** 11, L. I., N. Y. 816 Post Ave. & S. 18th St.
- **New York** 53, N. Y. 902 E. 14th St.
- **Philadelphia** 34, Pa. 3400 Market St.
- **Richmond** 18, Va. 1201-3 S. 15th St.
- **San Antonio** 6, Tex. 727 N. Cherry St.
- **San Francisco** 24, Calif. 345 Williams Ave.
- **St. Louis** 16, Mo. 3344 Morganford Road
- **York** 55, N. J. 200 E. 149th St.

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**APRIL 1952**
THIS BEAUTIFUL NEW HOME HAS
AMERICA'S FINEST WINDOWS
Fleetlite
Double, Double-Hung Aluminum

71 Saratoga Road
Eggertsville
(Buffalo, New York suburb)
Highland & Highland Architects

Contribute Modern Beauty
Reduce Building Time
Provide Living Comfort
Ease Housekeeping

A Fleetlite Window is different
— all parts are manufactured and
assembled in the factory and it is shipped complete, ready to install.

Fleetlite is a complete year-
round unit amazing in its ingenuity
of design and in the benefits it offers home builders and home owners.

OVER 500 CONTRACT-BUILT HOMES IN THE BUFFALO AREA

... and thousands throughout the country
are now equipped with Fleetlite windows.
Owners are delighted with the beauty,
convenience and everlasting investment value.

WRITE TODAY
for complete literature on
Fleetlite Windows

As advertised in House Beautiful, House and Garden, Small Homes Guide, American Builder,

Made by...

FLEET OF AMERICA, INC., 112 PEARL STREET, BUFFALO, N. Y.

(Continued from page 92)
mechanical principles are available
for closet installations, with fixtures
to increase accessibility of the
closet's contents.

Framing
In house construction, wall open-
ings for windows and doors must be
properly reinforced to avoid weaken-
ing the entire structure. The extent
of reinforcement and the type of
treatment depend upon the size and
location of the opening. In framing,
it is common good practice to double
headers, with the larger dimensions
set vertically at the top. Where open-
ings are wider than conventional
windows or doors, diagonal bracing
or trussing is required to obtain suf-
cient strength to avoid sagging or
failure. Good nailing practices are
particularly essential at this point.

All rough window and door open-
ings must be of the correct size to
take the window or door frame with-

(Continued on page 104)
Kewanee STEEL DOOR FRAMES

3-piece construction. Section ends reinforced with rigid stiffener strips, insuring perfect mitre joints. Jambs punched and recessed for standard 3½ x 3½" butt hinges.

Jambs punched and recessed for standard 3½"x3½" butt hinges. Jambs punched and recessed for standard 3½"x3½" butt hinges.

Seen and praised by hundreds of enthusiastic builders at the N.A.I.B. Convention.

UNIQUE IN DESIGN

... for the modern cost-conscious builder

LOWER FIRST COST — the most economical door frame on the market.

LOWER INSTALLED COST — can be installed in a fraction of the time required for ordinary jamb and trim. No temporary plaster stops to be erected and dismantled, no trim to be applied later, no mortising of jambs for hinges and strike. No filling of nail holes, no prime painting.

NAIL HOLES are provided every 7" along flanges of frame, assuring rigid attachment to sub-frame and preventing vibration.

RECESSED EDGE designed for both plaster and wall board. Edge of frame provides a plaster ground and cuts down plastering time.

SHIPPED KNOCKED DOWN — compactly packaged for easy handling and storage. Assembled without use of tabs or slots.

JAMBS PUNCHED AND RECESSED for standard 3½"x3½" butt hinges. Hinges furnished only when specified and then at extra cost.

TRIM APPEARANCE — in tune with today’s modern interiors.

FURNISHED IN STANDARD SIZES

Frames supplied for 1¾" or 1¾" doors

Patent Applied For

The finished floor is laid under the bottoms of the jambs. No cutting and trimming to fit jamb contours.

Attractively finished in enamel, with brass strike plate.

Sold Through Leading Building Material Dealers

Kewanee Manufacturing Co.

452 Burlington Ave., Kewanee, Illinois
Look what you save with "MODERNFOLD" Doors

"Modernfold" Doors Save Space

... because they fold rather than swing. A standard size "Modernfold" door stacks neatly against a door jamb when not in use, brings to life valuable floor and wall space normally "killed" by a fully opened swinging door.

At left, a large "Modernfold" door serves as a "movable wall" to divide rooms. Folding it against the outside wall creates a large 30-foot living room ... unfolding it fully adds an extra bedroom. The ability of "Modernfold" doors to make rooms do double duty helps speed sales for today's small homes builders.

"Modernfold" Doors Save Maintenance Costs

Folding framework is steel—double strength. Patent-ed hinge plates at both top and bottom provide smooth, accordion-like folding action; assure extra strength and rigidity. Unusually tall doors equipped with additional hinges.


"MODERNFOLD" DOORS SAVE INSTALLATION TIME

1. Slide head track onto trolleys, raise door to standing position, fasten it in place.
2. Attach jamb clips, screw jamb post to them. No planing or fitting necessary.
3. Job is done! No hardware to install. No painting or finishing required.

Look in your classified directory — under "doors" — for the name of our installing distributor.

NEW CASTLE PRODUCTS, New Castle, Ind. 
SOLD AND SERVICED NATIONALLY

Please send me full details.

Name
Address
City, State
Beautiful and Convenient R·O·W Windows are Removable—to wash both sides indoors.

R·O·W wood windows are available in a large variety of sizes and styles to meet all architectural requirements. For a catalog of sizes and details, write directly to R·O·W Sales Company, 1332 Academy, Ferndale 20, Michigan.
HOW TO REALLY SPEED DOOR AND FRAME INSTALLATION

VMP STEEL FRAMES GIVE YOU THREE BIG TIME AND LABOR SAVINGS

1. Pre-welded into complete one-piece assembly, VMP steel frames require no on-the-site assembly.

2. Mortises in doors and frames for locksets pre-cut at factory — no on-the-site mortising.

3. VMP flush metal doors exactly fit frames for perfect operation — no on-the-site cutting or fitting.

Why even consider using wood or any other door and frame when you get these three big installation cost cuts with VMP metal doors and frames. How much more satisfied you and your customers will be! For VMP steel frames never warp, sag, or crack. Never change dimension. Give longest, most dependable service. No customer complaints. No costly callbacks to repair doors or frames. And they're fireproof, too!

Order VMP metal doors and frames for plaster wall, masonry wall and dry wall construction, and cut your door and frame installation costs — way down!

FREE: Architect's and builder's manual illustrated with two-color isometric drawings gives valuable door and frame cost cutting data. Send for your personal copy — yours without charge. Just write “VMP Steel Frames” on your letterhead or card, and mail today to Dept. G4.

VIRGINIA METAL PRODUCTS CORPORATION
60 Hudson Street, New York 13, New York

out difficulty. This assures tightness and rigidity of construction. Before framing rough openings for windows, the dimensions of the window frames, including sash balances or weights, must be verified. These vary according to the type and weight of sash.

To make an opening for a door, add three inches to the width of the door and three inches to its height for both outside and inside doors. Measurements will vary slightly with individual door units. The main point to remember when framing any window or door is that the opening must be strong and rigid in all respects, and planned so that the door or window can be caulked or sealed and made weather-tight.

(Continued on page 104)

ACCORDION TYPE DOORS, STYLES AND SIZES

| EXPOSED TRACK ONLY—INCLUDING FINISH HARDWARE—AND WITH SELECTED FABRICS |
|---|---|---|---|---|
| NAME | WIDTH "W" | HEIGHT "H" | STACK "F" | WEIGHT |
| Duke | 2'-4" | 6'-81/2" | 61/2" | 45 |
| Regent | 2'-101/2" | 6'-81/2" | 71/2" | 50 |
| Mortor | 3'-21/2" | 6'-81/2" | 81/2" | 55 |
| Cotton | 3'-31/2" | 6'-81/2" | 91/2" | 60 |
| Morton | 4'-61/2" | 6'-81/2" | 101/2" | 65 |
| Sheinor | 5' | 6'-81/2" | 111/2" | 70 |
| Alden | 6'-1/2" | 6'-81/2" | 121/2" | 80 |
| Winton | 7'-1/2" | 6'-81/2" | 151/2" | 95 |
| Broadmoor | 8'-2" | 6'-81/2" | 171/2" | 115 |
| Logan | 3'-11/2" | 8'-0" | 9" | 70 |
| Leland | 4'-5/8" | 8'-0" | 101/2" | 85 |
| Longfellow | 5'-0" | 8'-0" | 111/2" | 95 |
| Locust | 6'-5/8" | 8'-0" | 121/2" | 110 |
| Lexington | 6'-71/2" | 8'-0" | 171/2" | 130 |
| Loring | 9'-3" | 8'-0" | 191/2" | 150 |
| Lancaster | 10'-31/2" | 8'-0" | 211/2" | 175 |

STOCK DOORS Immediately Available In Neutral Colors

| Leader | 2'-4" | 6'-81/2" | 61/2" | 45 |
| Master | 2'-101/2" | 6'-81/2" | 71/2" | 50 |

FRE EB: Architect's and builder's manual illustrated with two-color isometric drawings gives valuable door and frame cost cutting data. Send for your personal copy — yours without charge. Just write “VMP Steel Frames” on your letterhead or card, and mail today to Dept. G4.

100

(Continued from page 96)
out front wherever top quality is a must:

the all- Flexalum® blind

stays new, beautiful...clean!

- Flexalum tapes are non-porous plastic. Wipe clean with a damp cloth, last for years, won't fade, shrink, stretch or fray.
- cords are wipe-clean plastic too. Retain their tensile strength, wear longer without fraying or breaking.
- slats are sleek aluminum, spring-tempered for greater resilience, will keep their shape. Mar-proof finish won't chip, crack, peel, rust.
- sturdy top and rigid bottom bar also mar-proof finished.
- sealed-in-steel, friction-free mechanism is lubricated for life.
- plastic tassels are noiseless, unbreakable.
- extended top bars holds draperies too, without extra hardware.
- complete versatility of cord arrangement: Flexalum cords can be installed wherever most convenient.
- complete and perfect color-matching of every part...or choice of dramatic color contrasts.

new decorating possibilities!

uniform quality...recognized quality!

- one and only one reputable manufacturer is responsible for every part of the all-Flexalum blind...your assurance that every Flexalum blind will be of the same superior quality.
- National advertising has convinced your customers of Flexalum quality. Let Flexalum help convince them of the quality of your building!

Write for free 8-page catalogue containing full details on the all-Flexalum blind.

HUNTER DOUGLAS CORPORATION, Riverside, California or 150 Broadway, New York 38 Canada: Hunter Douglas Ltd., Montreal, Que.

APRIL 1952
STEELCRAFT STEEL RESIDENCE CASEMENTS
MADE OF HOT ROLLED SECTIONS...BONDERIZED

Steelcraft Steel Residence Casements are made of heavy hot rolled solid sections of uniform thickness, with butt welded mitred corners. Extra long reinforced hinges with bronze pins and washers provide ample clearance for safe and easy cleaning of the exterior of the glass from the inside. Sections are designed for maximum daylight. Heavy bronze finish roto or lever type hardware may be used for ease in operation of the ventilator. Screens and storm sash are easily attached to the inside of the frame. All casements are BONDERIZED.

STEEL BASEMENT WINDOW

Steelcraft tilt-in type steel basement windows are made of hot rolled sections, which provide double weathering contact throughout. Armies of steelcraft ventilators provide trouble-free operation and are easily removed. Positive handle locks sash tight against frame. Screens are easily attached to the outside of the window. They are BONDERIZED.

STEEL UTILITY WINDOW

For stock barns, basements, shops and garages, Steelcraft utility windows provide continuous double weathering contact, and removable tilt-in type armless ventilators. Draft guards can be furnished. They are BONDERIZED and given a shop prime coat of paint baked on in accordance with Steelcraft's Bonderizing Specifications.

INTERIOR STEEL CASING

Consisting of head, jamb, and sill members, this casing eliminates plaster returns, sills and trim. Made of galvanized steel BONDERIZED. Shipped knocked down for assembly in the field. Available in all types and sizes for Residence Steel Casements.

OUTSIDE-INSIDE TRIM

This one-piece outside-inside surround is installed at a fraction of the normal time required for multiple trim and casing. This unit eliminates plaster returns, sills and trim. In dry wall construction, the wall material is slipped under the surround, eliminating additional trim. Made of galvanized steel, and BONDERIZED.

EXTERIOR SURROUND

Designed with identical contours and ends accurately coped, this surround presents neat corners and joints in the assembly. They are nailed to the rough openings and the casement is attached with self-tapping screws. Made of galvanized steel, BONDERIZED.

THE STEELCRAFT MANUFACTURING COMPANY
STEEL BUILDING PRODUCTS
WITH ONE RESPONSIBILITY

STEEL SLIDING CLOSET DOORS
- Packaged Ready to Install
- Easy to install
- Cut construction cost
- Give added closet space
- Bigger selling point in home
Steelcraft’s new metal slide closet doors give extra storage space to any closet and give direct access too. No cutting...fitting...or unnecessary “extras”. This door and frame is a complete packaged unit ready for installation!

STEEL DOOR FRAMES
Use this modern building product at a great reduction in cost. One-piece all welded construction won’t crack, shrink, swell or warp. Reinforced mitred corners won’t open. Hinges spot welded to frame; adjustable brass strike plate furnished.

KNOCKED DOWN DOOR FRAMES
Knocked down door frames are designed for economical shipping, for maximum storage space, for quick easy assembly and installation. They provide long trouble-free service and neat appearance.

LOW COST ALUMINUM STORM SASH
for any metal casement window
Easily installed by home owner on inside of case- ment...just like screens. No fitting, no cutting or trimming, no special tools. Packaged, for over the counter sales.

PIVOTED STEEL WINDOWS
- Hot rolled new billet steel
- Sturdy heavy duty construction
- Double contact weathering
- Built-in bearing type pivot
- Easily installed
Made of hot rolled new billet steel, Steelcraft pivoted windows are engineered for permanent easy operation of the vented section. They cannot stick, warp or shrink and are BONDERIZED for protection. The outside sections are angle shaped to provide firm anchorage in the masonry or mullion connection. Double Flat contact weathering is provided on all four sides of the ventilator.

STEEL LINTELS
Steelcraft formed steel lintels are available in a wide range of stock sizes for any window or door opening. Continuous ribs strengthen the heavy gauge steel, and provide an excellent base for brick and mortar. All lintels are BONDERIZED.

STEEL DOORS
Steelcraft industrial steel doors will not warp, shrink, swell, chip or splinter. They are fire-resistant and will give years of trouble-free service. They come to the job with lockset and hinge cut-outs already fabricated to receive standard tubular lock-sets...no fitting, no drilling or mortising, simply insert hardware and hang door. Rights and lefts are interchangeable by reversing the doors. Steelcraft doors are finished with a special baked-on enamel providing an excellent base for field painting.

MAIL THIS COUPON TODAY
THE STEELCRAFT MANUFACTURING CO., DEPT. AB-457
9017 BLUE ASH ROAD, ROSSMOYNE, O. (In Greater Cincinnati)

Please send literature on full line

I am particularly interested in

Name

Company Name

Business Address

City Zone State
It's equipped with Dura-seal...the combination metal weatherstrip and sash balance! It provides the best weather protection and the easiest window operation!

- Dura-seal's jamb member is made in one piece and its concave back surface provides a flexibility which maintains a constant air seal and smooth window operation even when the sash expands or contracts due to changeable atmospheric conditions. (Springs are completely covered—photograph shows cover down on lower sash to illustrate spring.)
- Full jamb weatherstripping provides better weather protection, eliminates paint-stuck windows and improves window appearance.
- Because Dura-seal is self-adjusting, it assures trouble-free operation with no replacement or maintenance costs.

BUILDERS! Ask your lumber dealer about Dura-seal or see Sweet's File, Builders, Section 3g.

ARCHITECTS! See Sweet's File, Architectural, Section 19b.

Dura-seal is cut exactly to the pitch of the sill—another feature that helps make a more attractive and efficient window.

WOOD LOUVRE doors help control ventilation and afford privacy at the same time

(Continued from page 100)

Door Frames

Modular co-ordination has been definitely established by Project A-62 of the American Standards Association. As a building technique, it plays an important part in door frame construction. Basic frame designs have become more versatile and use varied materials of different weights and thicknesses.

Metal door frames which fit into either frame or masonry construction are available from a number of manufacturers, and may be used freely with modular construction. The frames are secured to wood stud partitions with metal clips, to masonry partitions with loose "T" anchors placed at masonry joints, and to steel stud walls by anchors welded to the frame (these may be bolted or welded to the steel studs)

(Continued on page 106)

WHERE WIDE openings occur in the framing, extra care should be taken in header construction because so much of the load above is carried on these members. Illustrated is one good method. Note that diagonal members are carefully fitted and placed for rigidity.
VENTO STEEL WINDOWS

VENTO RESIDENCE CASEMENT WINDOWS
Extension type hinges, gracefully designed Roto or Lever type operators and positive cam action locking handles, allowing ventilator adjustment without screen removal. Available in all standard types and sizes.

VENTO "CHAMPION" BASEMENT WINDOWS
Three ventilation openings and sash removal. Double contact with leak-proof watershed sill. 14 gauge electrically welded frame, fins welded to jambs for quick installation. Three standard sizes, putty or puttyless glazing.

VENTO "THRIFTY" BASEMENT WINDOWS
A real economy window especially designed for lower cost housing. Two position ventilation and easy sash removal. Fin flanges at jambs for quick installation. Three sizes, putty type only.

VENTO LINTELS for BLOCK or BRICK CONSTRUCTION
Of ample load-bearing capacity for window or door openings. Formed lintels of 10 gauge steel for block construction, with stiffening crimp in center, in lengths from 2½ ft. to 5 ft. Formed lintels for brick construction 2½ ft. to 5 ft. long of 11 gauge steel; 5½ ft. to 7 ft. of 10 gauge steel.

Also Vento "Champion" Barred Basement Windows; Vento "Champion" Utility and Barn Windows; Vento "Thrifty" Utility and Special Type Windows.

See our catalog in Sweet's 1951 Architectural 27b/Vc or Sweet's 1952 Light Construction File 4c/Vc. Write us for full information and name of nearest distributor.

VENTO STEEL PRODUCTS CO. INC.
247 Colorado Avenue Buffalo 15, N.Y.
## Residential Double Hung Metal Windows

<table>
<thead>
<tr>
<th>Dimensions</th>
<th>Types</th>
<th>Dimensions</th>
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<tbody>
<tr>
<td>3'0&quot; 34&quot; 20&quot; 24&quot;</td>
<td>&quot;B&quot; Types</td>
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*DIMENSIONS SHOWN ARE WINDOW DIMENSIONS.*

### Fixed Panels

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<td>F3445 F4045 F4845</td>
</tr>
<tr>
<td>5'1&quot; 5'6&quot; 5'12&quot;</td>
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</tr>
<tr>
<td>5'8&quot;</td>
<td>F3845 F4059 F4859</td>
</tr>
</tbody>
</table>

### 4 Big Advantages of Alcasco Aluminum Casements

1. **Full 1 1/8" Sections**
   - Available only in Alcasco.
   - Structurally stronger. Putty retaining groove—built into each section and designed for easy outside glazing.

2. **Extension Hinges**
   - Solid aluminum.
   - Sturdy and trouble-free.
   - Full support. Stainless steel pin assures correct ventilation operation at all times.

3. **Insulated Glass**
   - Alcasco Aluminum Casements can be furnished for regular plate or insulated glass in 1/2", 3/4", or 1" thickness.

4. **Interlocking Mullions**
   - Easy to assemble — simple to install.
   - Provides a perfect weather seal due to precision fabrication.

### Plus these other Alcasco aluminum casement features

- Extruded members are smooth—fit snug at all points.
- Corners electrically flash welded—greater strength.
- More rigid.
- Neat, smooth appearance.
- Stand inspection — customer satisfaction assured by the obvious evidence of careful workmanship.
- Selection — over forty styles to choose from.

Send for details and descriptive literature.
Al says:

“Be smart-build in both markets”

- “Your houses this year must be built to sell—if they are to turn over quicker than your competitors. And man, that takes some smart figuring. Competition is keen! But here’s an angle: Give your houses extra eye appeal—and they’ll sell fast! One sure way to add eye appeal is with Ualco Jalousies. Their smart glass louvres and satin-smooth aluminum frames give a different touch. They literally “make” a sunroom, a breezeway—and, used with other Ualco Windows, create dramatic effects buyers really go for. Give them this feature, and I’ll guarantee you’ll sell ahead of competition.

“And to stay ahead... ready to jump the gun when restrictions are removed... keep your crews working; hold them together—by cultivating the vast remodeling market.

“With families growing, most people need to ‘Make More Room’. By using Ualco Jalousies to enclose porches and patios, build breezeways and sunrooms, you can give ‘em more room at a price they can’t refuse.

“That’s my advice. Go after the 4 billion dollar remodeling market in addition to new construction. Build in both markets and CASH IN ON BOTH WITH UALCO JALOUSIES—America’s newest, most wanted windows!”

You’ll enjoy knowing Al. He’s friendly and wise. From time to time he’ll be passing along more of his ideas on building. Watch for him regularly.

Al is a builder who knows the score. He’s been in the business a long time, through two wars, hard times, and two booms. Yes, Al knows the score. He knows it takes new thinking to stay on top, to keep his better men together and to keep building!
Steel Casement Windows Types and Sizes

Glass Schedule

<table>
<thead>
<tr>
<th>Mark</th>
<th>W</th>
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<tr>
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<td>45</td>
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<td>12</td>
</tr>
</tbody>
</table>

Glass sizes are for guidance only and should be verified on the job.

Stairways

STAIRWAYS should be framed with not less than three horses and of stock wide enough to leave 3\(\frac{1}{2}\) inches of material behind each cut. Landing must be supported and stair braced against thrust.

(Continued from page 104)

(Continued on page 108)
On job after job, in every part of the country...

the RUSCO PRIME WINDOW

is making big savings in construction time, labor and materials!

4 BIG REASONS WHY...

1. A complete, pre-assembled unit, factory painted, hardware fitted, ready to install
2. Can be fully installed in as little as 5 minutes
3. Convenience of completely removable and interchangeable glass and screen panels
4. No costly call backs for adjustments

RUSCO HOT-DIPPED GALVANIZED PRIME WINDOW

Available with or without insulating sash
Made of Hot-Dipped Galvanized Steel, or Equal, Bonderized and finished with baked-on Outdoor Aluminum Enamel

For additional information or specifications write or wire...

F. C. RUSSELL COMPANY, DEPT. 7, AB-42, CLEVELAND 1, OHIO

APRIL 1952
Heavy Duty Steel Swing Doors
Styles and Sizes

<table>
<thead>
<tr>
<th>SWING DOOR STOCK TYPES AND SIZES</th>
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<tr>
<td><strong>SINGLE DOORS</strong></td>
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<td>4080-G</td>
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<tr>
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</tr>
</tbody>
</table>

Wood Awning Windows
Standard Styles and Sizes

![Wood Awning Windows](image)

Drywall Trim, Inc.
545 Fifth Ave., New York 17, N.Y.

The NEW
STEEL CASING
FOR DOOR AND
WINDOW TRIM

Today's Biggest
Boon to Dry Wall
Installation

Firmly grips
board with a
SPRING-TIGHT
action!

Saves Time,
Money, Labor

- Precision Rolled,
Made from Sharon
Steel Galvanite
- Easy to Cut and Mitre
- Protective, Decorative
- Paint Readily
Adheres to Surface
- Gives Faster,
Better Installation
with Permanent
Rigid, Snug Fit

Write for
Descriptive Literature
and Samples

surance that all members will be held to their original positions. Stair horses should be firmly secured against header of stair opening. In no case should they be hung from it.

Because 40 to 60 per cent of home accidents are falls, with about one-third of them on stairs, safety principles are paramount in importance in building stairs. Hold

(Continued on page 116)
Gallons of water a minute guarantees the weather-tightness of Adlake Aluminum Windows.

ONLY ADLAKE ALUMINUM WINDOWS GIVE YOU ALL THESE "PLUS" FEATURES:

- Woven-Pile Weather Stripping with Patented Serrated Guides
- Minimum Air Infiltration
- Finger-tip Control
- No Painting or Maintenance
- No Warp, Rot, Rattle, Stick, or Swell

During the water test, which is only one of the rugged tests that ADLAKE Aluminum Windows must pass, 500 gallons per minute are played upon the window. This actually goes beyond the air infiltration test of the A.W.M.A. at the Pittsburgh Testing Laboratory.

ADLAKE'S exclusive combination of woven-pile weather stripping with patented serrated guides forms a perfect weather seal. What's more, tests prove that ADLAKE's famous finger-tip control continues through one million raisings—and the windows last through the entire life of the building!

Yes, the standards of ADLAKE Aluminum Windows are kept high by quality control and thorough testing. That's why the ADLAKE name is your best assurance of dependability, long-range economy, and lasting beauty. Get the full story on ADLAKE Windows today...

Adlake Aluminum Windows
Adams & Westlake Company
Established 1857 • ELKHART, INDIANA • New York • Chicago
APRIL 1952
The People's Choice!

CECO metal WINDOWS

Ride the tide of public preference
- build with CECO and be sure

CECO STEEL
In construction products CECO ENGINEERING
There's good reason for the swing to Ceco Metal Windows because they offer so much in so many ways.

Yes, home owners know the advantages. In recent studies they told us they prefer metal windows for ever so many reasons—such as beauty and design—better ventilation—ease of opening and closing because metal won't stick.

They told us metal windows are easier to maintain—easier to clean and wash—easier to change storm windows and screens—and of course they said they give more light than any other window opening.

There's the story of Ceco Windows written in customer preference. But there is even more to be said—for Ceco Windows blend harmoniously with every home design—accent the modern lines of Contemporary Architecture—emphasize the informality of the Ranch Style home—compliment the simplicity of Cape Cod Colonial.

Because they are better made—better engineered—they are stronger—last longer. When you build with Ceco Windows you know you build with the very best...you assure your customers savings too.

CECO STEEL PRODUCTS CORPORATION
General Offices: 5601 West 26th Street • Chicago 50, Illinois
Offices, warehouses and fabricating plants in principal cities

makes the big difference
NEW TYPE SCREENS ADD 10 Plus Values!

NEW ALUMINUM FRAMELESS TENSION SCREENS

Sealed Tight... Held by tension. Exclusive sill bar adjusts to off-level sills.

1. INCREASE SALES APPEAL of homes, apartments, motels, cottages, etc.
2. NEAT APPEARANCE... CONVENIENT
3. LOW COST—LONG LIFE
4. EASY TO INSTALL
5. EASY TO HANDLE
6. NO PAINTING—WON'T RUST OR STAIN
7. SEALS TIGHT with exclusive free floating sill bar... assures snug fit at bottom... adjusts screen to uneven or off-level sill.
8. EXTRA STRONG VERTICAL EDGES are 5-strand selvage, of special flat wire, to keep edges taut.
9. PATENTED TENSION CATCH at sill holds Keystone Screen securely in place.
10. EASILY REPLACED

You can add a whale of a lot of sales-appeal to homes and apartments—at low cost—with Keystone Aluminum Tension Screens on all double-hung windows!

Saves 25 minutes per window in installation time. Easily installed—no heavy frames to cut or fit. No painting—no rust. A neat and attractive full-length, low-cost screen of outstanding long life! Users everywhere praise Keystone advantages! Send today for details!

SEND COUPON!

Keystone Wire Cloth Co.
Dept. D 16, Hanover, Pa.
Without obligation, send me complete details, prices and discounts on NEW products making Keystone Frameless Tension Screens.
Firm: ____________________________
Address: _________________________
City: _____________________________
State: ____________________________

Steel Picture Windows Types and Sizes

for standard glazing

<table>
<thead>
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<th>Mark</th>
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Glass sizes are for guidance only and should be verified on the job.

Steel Picture Windows Combined with Casements

for insulating glazing

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</tr>
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<td>82</td>
<td>671/4</td>
<td>671/2</td>
</tr>
</tbody>
</table>

Glass sizes are for guidance only and should be verified on the job.

Combining Picture Windows with Casements

Cresco Steel Window Data

AMERICAN BUILDER
Paine Rezo Doors

built up to a standard not down to a price

There is no substitute for experience in establishing and maintaining quality.

Over five million Paine Rezo doors are in use since 1935.

Manufactured by the

Paine Lumber Co., Ltd.

Oshkosh
Wisconsin

Established 1853

April 1952
When Ordering Your Millwork

insist on

ALLWEATHER

BALANCE STRIP

Your double hung window assembly will be as modern as tomorrow if equipped with the Double Duty ALLWEATHER Balance Strip.

Double Duty because it provides dependable tongue and groove weatherstrip with maximum area of contact, plus positive counter balance of sash. Lifting springs are concealed without the use of sleeves or covers.

Two types of parting head are available. Illustrated is the Metal Hat Type Parting Bead which provides a completely metal covered sash runway. No wood parting bead is required.

The inset view shows a Metal Parting Bead Cover to be used with conventional wood parting bead. Both eliminate the need for painting.

The ALLWEATHER Balance Strip is covered by U.S. Patents... Nos. 2,284,436-2,284,438... other patents pending.

THESE FEATURES MAKE ALLWEATHER BALANCE STRIP OUTSTANDING

ALLMETAL Weatherstrip Company

2243 N. Knox Ave., Chicago 39, Ill.

WOOD STAIRWAY in harmony with architectural treatment of interior

Stairways...

(Reduced from page 110)

risers to 6 1/4 to 7 inches and treads 10 1/2 to 10 3/4 inches, slight variations being possible, but the sum of riser and tread should be about 17 1/2 inches. All treads should be the same width and risers the same height in any one flight of stairs. Angle of rise should be between 30 degrees and 36 degrees, and a secure railing should be installed 36 inches above the center of the treads.

Allow for adequate headroom. Minimum distance between nose of treads and sofit over stairway in a line parallel with the horses should be 6 feet 8 inches for main stairs and 6 feet 4 inches for basement and service stairs.

Metal Stairs

Metal stairs in light construction are useful for fire escapes, service stairs, and sometimes for main stairs in homes where design or decorative treatment permits. Stair stringers are usually made of steel channels, the weight of the load to be carried and that of the stair determining the size of the channel. For ornamentation an applied molding is secured to the top and bottom flange of the stringer.

Carriers, also known as horses or pitch blocks, are made of angles riveted to the stringers. Risers and under-treads are normally made of No. 14 or No. 12 USS gauge steel. Newels are normally square bent steel tubing with sanitary flush weld caps and drops, unless ornamentation is desired. Railings may carry almost unlimited ornamentation.

Metal stairs are also made in the form of permanent steel forms for concrete stairs, using only stringers and risers.

(Continued on page 120)
From coast to coast, architects are specifying and builders are using THOMASON Flush Doors. It requires practically the entire production facilities of one of the two large plants of the THOMASON PLYWOOD CORPORATION to meet the demand.

**Available With These Face Veneers**

In addition to the Gumwood faced door, the THOMASON Flush Door comes faced with veneers of Mahogany, Walnut, Oak, Birch, Knotty Pine, Cativo, or in any face veneer desired.

**Also Made For Exterior Use**

Available either plain or with any one of five standard patterns of light opening. Or you may have the THOMASON Flush Door with a solid all-wood core, faced with any type of veneer desired.

**THOMASON PLYWOOD CORPORATION**

FAYETTEVILLE • NORTH CAROLINA
...and to help you SELL the homes you build, FASTER!
Builders everywhere say AUTO-LOK Windows swing the sale with prospective buyers, especially women. AUTO-LOK Windows are so practical...they have so many advantages over ordinary windows...they add so much to appearance...it's no wonder they often make the difference when the competitive chips are down!

Tightest closing windows ever made!
AUTO-LOK Windows close 10 times tighter than ordinary windows...save enough on fuel bills to pay for themselves over and over again. Open widest...to catch every breeze and provide 100% ventilation, but no drafts. Perfect for any climate...perfect for any type of architecture!

New homes aren't new without Auto-Lok
No other window gives you all these outstanding features to pass on to home owners!

FRESH AIR WHILE IT'S RAINING...
No more running to close windows...rain can't enter through slanting sash!

WARMER IN WINTER...
Seals itself shut like the door of your refrigerator...keeps heat in...cold out!

COOLER IN SUMMER...
Opens widest...scoops air inward and upward...luxurious ventilation, but no drafts!

PRACTICAL BEAUTY...
Narrow horizontal lines add distinction to any home...lend themselves to a wider variety of architectural arrangements.

INTERCHANGEABLE SCREENS AND STORM SASH...
Can be handled all from the inside. Just flip the clips...no tools required. Reduce a day's work to minutes!

ABSOLUTELY EASIEST TO CLEAN...
Nothing to lift out...no gadgets to disengage. Simply open wide and clean the outside from the inside...top sash, too!

FRESH AIR NITE-VENT...
Bottom sash opens slightly for night ventilation, while upper sash remain securely locked and weather-tight...fresh air circulation during bad weather, too!

FINGER-TIP CONTROL...
Operates at the touch of a finger! Perfectly balanced for a lifetime of friction-free operation...No adjustments ever...never sticks...never rattles!

CONCEALED HARDWARE...
No unsafe, unsightly mechanism exposed to collect dust. Compact rato-type operator handle does not interfere with drapes, blinds, etc.

NO WONDER THEY'RE THE WINDOWS WOMEN WANT MOST!

Add extra "buy appeal" to every home you design or build with WINDO-TITE Jalousies and Doors. Turn porches and breezeways into beautiful, comfortable rooms. Specify WINDO-TITE Jalousies...absolutely no operational "bugs"...made by the world's largest manufacturer of Awning Windows and Jalousies!

Sizes shown with asterisk are standard and normally carried in stock. Others are standard but not stocked.

LUDMAN LEADS THE WORLD
WOOD WINDOW
Easiest to install...
Saves installation
time and costs!

AUTO-LOK Wood Windows cost no more than a
good grade of ordinary, old-fashioned windows...
yet, you can't install a better window at any price!
Delivered to the job completely assembled. No
parts to lose! No hardware to install!

ALUMINUM WINDOW
Successfully combines
the best features
of all window types!

Designed and produced by men who know windows
and window problems. In both AUTO-LOK Aluminum
and Wood Windows, the secret of wide acceptance
is the patented AUTO-LOK Hardware...plus "floating
seal" weatherstripping. Perfectly balanced operating
mechanism eliminates wear and strain on every
moving part, assures "no-wear" operational ease for
the life of the building.

SCHEDULE OF SIZES

STANDARD COMMODITY TYPES AND SIZES

All sizes (dimensions) shown are buck to buck dimensions. To
determine overall window sizes add 1" to each dimension.
Fixed sidelights are separate right and left hand and may be
ordered in pairs or singly.

SEE YOUR LOCAL DEALER...or WRITE TODAY FOR THE
NAME OF THE DEALER, NEAREST TO YOU,
WHO HANDLES AUTO-LOK WINDOWS! Specify the AUTO-LOK
Window you are interested in...Aluminum or Wood?

LUDMAN Corporation

SALES OFFICES: NEW YORK • WASHINGTON, D.C. • ST. LOUIS • SAN FRANCISCO • BOSTON • CHICAGO • ATLANTA • HOUSTON

IN WINDOW ENGINEERING

APRIL 1952
"YEAH!"

"You bet! I’m putting Master No-Draft Sash Balances like this in every window. They give the windows smooth metal tracks to run on, and their counter-balancing springs make windows easy to raise and lower. Think what a selling point this gives me. Joe, windows that always work right . . . windows with no ropes to break, no pulleys to rust. But that isn’t all! These Master No-Draft Sash Balances weatherstrip the windows, too. That means they keep out dust, dirt, wind and water . . . and cold, besides. What’s more, they cost less to install, because they don’t need pulleys, cords, weights or box-frames. And MAN . . . you ought to see how easy they are to put in!"

MASTER NO-DRAFT SASH BALANCES ARE PRECISION-MADE of the finest, highly-tempered non-corrosive metal. They can’t rust. Springs are correctly-tensioned to give perfect balance of the upper and lower sash . . . and easy, fingertip operation. These sash balances are made in a factory that’s recognized by the industry as outstanding for its efficiency and the craftsmanship of its workers.

SMOOTH OPERATION IS ASSURED by Master No-Draft Sash Balances, because they automatically adjust for shrinkage and expansion in the wood. Runways are completely metal-covered and require no painting. (Of course, cross-members should be installed). Double contact prevents rattle when windows are open.

USED BY THE U.S. GOVERNMENT AND PROMINENT BUILDERS all over the country, Master No-Draft Sash Balances are tested to mechanical perfection. They make windows neat and weathertight—and there’s nothing to cause trouble, You can forget maintenance!

See Our Catalog in Sweet’s Fa

NOTE: The Master No-Draft Sash Balance is the original patented combination sash balance and weatherstrip and still the best.

Disappearing Stairs

A number of manufacturers fabricate disappearing stair units which are designed for use with attics without taking up the space normally required for a finished stairwell. No vertical or horizontal clearances are required in the attic or loft; all that is needed is to cut a rough opening and install the unit. Some models move by counterweights, some are of one-piece construction on the stringer, others have a semi-extendible feature to save more space. Safety treads, an insulated ceiling-door panel, and rigid construction are features of several models.

Weather Stripping

The problem of making door frames and window frames weathertight has brought about the development of a wide variety of weather stripping materials.

Perhaps the most popular types today are of metal construction, some being merely weather strip, some containing the sash-balance unit, others being incorporated into spring tension windows which work without balances or counterweights.

For existing windows there are also a variety of types of stripping which are designed to prevent drafts and unnecessary heat loss.

The Weatherstrip Research Institute is constantly working with builders and architects to make this type of weather protection more effective.
Here's Sensational Value! COPCO'S Economy LIVING ROOM WINDOW

A beautiful large picture window (approximately 4 feet wide by 4 feet high) with full height ventilators on both ends (approximately 1½ feet wide by 4 feet high)—all built in one shop fabricated unit. With all this extra light and fresh air, you also gain approximately 1½ feet wider wall space for furniture arrangement than is provided by the ordinary picture window unit.

Here are a few of the many other reasons why COPCO'S Economy Living Room Window Unit is a truly sensational value:

**EASY OPENING.** COPCO'S Living Room Window glides open and shut with fingertip ease . . . especially desirable for that "hard-to-reach" area over the davenport.

**BETTER CONTROLLED VENTILATION.** COPCO'S "Air-Deflector" ventilator catches breezes from three directions. Flow of air easily controlled.

**EASIER CLEANING.** COPCO'S extension type hinge permits safe, easy cleaning of both sides of the glass from inside the room.

**LIFETIME SCREENS.** COPCO metal frame screens on inside of window are protected from weather . . . do not interfere with curtains or blinds . . . and can be put up or removed from inside the room—safely, quickly, easily.

**QUALITY CONSTRUCTION.** Made of specially designed, hot-rolled solid steel sections with welded construction . . . Duranized and finished with baked-on coat of rust-resistant paint . . . the same high quality as all other COPCO residence casement windows.

Coppo's complete line of residence casements offers builders the most satisfactory window units for every room in the home. Get complete information from your local retailer of lumber and building materials . . . or mail coupon below.

---

GET FULL INFORMATION TODAY!

**COPCO STEEL & ENGINEERING COMPANY**

<table>
<thead>
<tr>
<th>COPCO Steel Products Division</th>
</tr>
</thead>
<tbody>
<tr>
<td>14300 Grand River Avenue</td>
</tr>
<tr>
<td>Detroit 27, Michigan</td>
</tr>
</tbody>
</table>

Without obligation, please send me additional information regarding the complete line of Coppo Residential Metal Building Products.

**NAME:**

**ADDRESS:**

**CITY:**

**ZONE**

**STATE:**
Once again Curtis enlarges its manufacturing facilities to provide a complete woodwork service to builders! Through the purchase of American Plywood Corporation, New London, Wisconsin, Curtis can now supply top-quality flush doors—the Curtis New Londoner—Curtis Plyoneer—and Curtis American solid-core door.

From every angle—beauty, fine craftsmanship, durability—Curtis New Londoner hollow-core flush doors match the high standard set for over 85 years by the popular Curtis panel doors. With these two types, Curtis today can meet your every need and taste in exterior and interior doors for homes, schools, public and industrial buildings.

The addition of the famous Curtis New Londoner all-wood flush doors to the Curtis line is further evidence that Curtis Woodwork products are always in step with current architectural trends and tastes. Those products include such famous ones as Curtis Silentite windows, a complete line of kitchen cabinets and a line of architectural woodwork which has won widespread praise from architects, builders and home owners alike.

Full information on Curtis New Londoner flush doors, Silentite windows and other Curtis Woodwork will be sent you on request.
What's BETTER About Curtis New Londoner All-Wood Hollow-Core Flush Doors...

Superior beauty—just as in the finest furniture, the wood grain figures of Curtis New Londoner flush doors are matched carefully to provide balanced, harmonized patterns. Doors are sanded with fine sandpaper for quick, easy finishing. Available in birch, maple, oak, and other woods.

Patented locked wood grid—made of precision milled, meshed and interlocked horizontal and vertical pine strips. Grid is firmly "welded" to both faces—no "floating" units.

Specially bonded faces—water-resistant bonds which stay tight under high humidity conditions. Bonding for exterior doors fully waterproofed.

A door that stays true—all Curtis New Londoner flush doors are kiln dried—then sealed against atmospheric changes. All interior structural strain is eliminated.

Sturdiness proved in over 4,000,000 installations—established reputation for quality with architects, builders and home owners.

Several choices of light openings are available.

Extremely easy to hang and finish—a popular feature with carpenters.

Both ends of doors branded with Curtis New Londoner name for easy identification.

Curtis Plyoneer Hollow-Core Flush Doors
These Curtis doors have the same high quality construction as the Curtis New Londoner hollow-core door, except that faces are not matched-grain.

Curtis American Solid-Core Flush Doors
The same inherent quality found in Curtis New Londoner hollow-core doors is available in Curtis American solid-core flush doors. These doors have a kiln dried core and are edged with hardwood strips all around. Face panels are phenolic bonded. Available in extra widths for school, hospital and institutional use.
THE WEATHERPROOF PRODUCTS CORPORATION

Waldo Station, P.O. Box 8498 Kansas City 5, Mo.

The Name Guarantees
Everybody Wants

HOPE'S WINDOWS, INC., Jamestown, N.Y.
THE FINEST BUILDINGS THROUGHOUT THE WORLD ARE FITTED WITH HOPE'S WINDOWS
AMWELD®
“K-D” Steel Sliding Closet Door Units
OFFER
what every builder and home owner wants...

A Complete Quality Product
LOW COST!
Savings in Installation and Maintenance Costs!

The perfect product for both new home construction and remodeling

Header, Jambs, Track, Panels and Hardware COMPLETE in one package

LOOK at all the space you save
... from 6 to 9 square feet of floor space (shaded area) required for swing door. AMWELD Sliding Closet Doors permit use of all this space PLUS wall space and full access to closet contents.

DEALERS: Ask us to send you complete information on how to become an AMWELD dealer.

BUILDERS: We will be glad to send you detailed prints and name of your nearest dealer.

ARCHITECTS: May we send you our new 1952 AIA File giving complete specifications?

Also Available
The complete AMWELD line of Interior Steel Doors—Frames—Assembled Sliding Closet Door Units and Labelled Fire Doors.

BUILDING PRODUCTS DIVISION

THE AMERICAN WELDING & MANUFACTURING CO. · 310 DIETZ ROAD · WARREN, OHIO

APRIL 1952
LOW-COST METHODS MAKE THIS PRACTICAL

The appeal of picture windows has been tremendous—even more powerful when glazed with Thermopane® insulating glass.

Now builders are taking the popularity of Thermopane and really putting it to work. They’re offering Thermopane in every window of the house—in moderately priced houses.

Builders are doing it by using standard sizes of Thermopane in standard types and sizes of sash. They are simplifying glazing by cutting down on the number of glass sizes used. Some are using only two sizes for the entire house. Many are using economical Thermopane made of DSA window glass for all windows other than picture windows.

The information on the right-hand page is provided to help you fit the appeal of Thermopane into your plans. Picture window sizes are made in ¼” plate glass, while Thermopane for other sash is made in both ¾” plate and DSA window glass—giving you a choice according to budget demands.

Give your houses the extra appeal of Thermopane all around. Promote it—and watch prospects go for it.

See your L-O-F Distributor for information on promotional material, and for detailed information on low-cost methods of installing Thermopane. Or write us. Libbey-Owens-Ford Glass Company, 342 Nicholas Bldg., Toledo 3, O.
### Standard Sizes of Thermopane

#### 1" Thick Units

<table>
<thead>
<tr>
<th>Sash Manufacturer</th>
<th>Window Style</th>
<th>Sash Opening Width</th>
<th>Sash Opening Height</th>
<th>Glass Size Width</th>
<th>Glass Size Height</th>
</tr>
</thead>
<tbody>
<tr>
<td>Andersen Corp.</td>
<td>Standard Wood Picture</td>
<td>4 7/8&quot; x 4 5/8&quot;</td>
<td>40&quot; x 40&quot;</td>
<td>4 7/8&quot; x 4 5/8&quot;</td>
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<tr>
<td></td>
<td>Standard Wood Picture</td>
<td>5 3/4&quot; x 5 3/4&quot;</td>
<td>48&quot; x 48&quot;</td>
<td>5 3/4&quot; x 5 3/4&quot;</td>
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<tr>
<td></td>
<td>Standard Wood Picture</td>
<td>6 3/4&quot; x 6 3/4&quot;</td>
<td>56&quot; x 56&quot;</td>
<td>6 3/4&quot; x 6 3/4&quot;</td>
<td>56&quot; x 56&quot;</td>
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#### 1 1/2" Thick Units

<table>
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<tr>
<th>Sash Manufacturer</th>
<th>Window Style</th>
<th>Sash Opening Width</th>
<th>Sash Opening Height</th>
<th>Glass Size Width</th>
<th>Glass Size Height</th>
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<td>Standard Wood Picture</td>
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#### 2" Thick Units

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<th>Sash Manufacturer</th>
<th>Window Style</th>
<th>Sash Opening Width</th>
<th>Sash Opening Height</th>
<th>Glass Size Width</th>
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</table>

Thermopane made with window glass should not be turned when set in place. All Thermopane units made of polished plate glass can be installed with either dimension set vertically. Window openings will vary according to individual sash manufacturer's specifications. Therefore, manufacturers should be contacted for full information regarding their units.

Note: Some representative sash manufacturers of different styles of windows are listed on this page. This listing does not purport to be a complete listing of manufacturers and styles, nor does it necessarily include all styles and sizes made by each of the listed manufacturers.

#### STANDARD SIZES FOR FARM SERVICE BUILDINGS

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For detailed information about owning and maintaining contact your L-O-F district office.

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</tr>
</thead>
</table>

For detailed information about owning and maintaining contact your L-O-F district office.
YOU GET

All three

WITH RA-TOX FOLDING DOORS

Here's an ideal solution to three of the biggest problems in home design and construction. Wherever Ra-Tox Folding Doors have been used, they have won immediate approval of the home buyer. Today Ra-Tox Folding Doors offer the builder and architect a proved and practical means of achieving:

**Beauty...**

a refreshingly new approach to room design. Used as an interior door, or room divider, the effect is unique and delightful. In natural wood finish, Ra-Tox Doors blend with any room design. And they're also supplied in a variety of colors to match any color scheme.

**Lower Cost...**

achieved because (1) Ra-Tox Folding Doors are supplied to you complete with all hanging hardware and finished as specified, (2) installation requires only the mounting of an overhead track plus attachment of anchor molding and (3) much costly wall construction is eliminated since the door can be hung from ceiling to floor and from wall to wall.

**More Room Space...**

Ra-Tox Doors open by folding to one side. All the wall and floor area wasted by swing type doors is available for use... an important factor in today's new homes, where room areas are often relatively small.

For new construction and for remodeling, Ra-Tox Folding Doors offer distinct opportunities for better design and lower cost. For complete information write for Bulletin 406...or refer to Sweet's File, Architectural, 1952 Edition, Section 16HO.

THE HOUGH SHADE CORPORATION
Ra-Tox Division
JANESVILLE, WISCONSIN

---

**Popular Patterns For Exterior Doors**

- **N.D. 507**
- **N.D. 508**

Above 1 light design N.D. 507 can be divided as in Design N.D. 508 or other divisions are available as listed below:
- N.D. 509—9 lts., 3 w.
- N.D. 510—8 lts., 2 w.
- N.D. 511—9 marq. lts.
- N.D. 512—12 lts., 3 w.

- **N.D. 506**
- **N.D. 500**

Above 1 light design N.D. 506 can be divided as in Design N.D. 506 or other divisions are available as listed below:
- N.D. 501—6 lts., 2 w.
- N.D. 502—9 lts., 3 w.
- N.D. 503—12 lts., 3 w.

- **N.D. 537**
- **N.D. 538**

Above 1 light design N.D. 537 can be divided as in Design N.D. 538 or other divisions are available as listed below:
- N.D. 536—3 hor. lts.
- N.D. 539—6 lts., 3 w.
- N.D. 542—3 vert. lts.
QUALITY WOOD PRODUCTS
From Long-Bell Douglas Fir and Ponderosa Pine factor-
ies—quality Frames, Industrial Cut Stock, Sash and
Doors, Glazed Sash, Box Shook... Kitchen Cabinets...
Unpainted Furniture... Prefabricated Building
Stock... varied Products.

OAK FLOORING
PONDEROSA PINE
and DOUGLAS FIR
PLYWOOD
HEMLOCK...CEDAR...
WHITE FIR
SOUTHERN PINE
and HARDWOODS
TREATED PRODUCTS
...Woods treated with cre-
osote and standard salt pre-
servatives, from Long-Bell
Wood Preserving Plants.

Now Long-Bell Brings You
TWO BEAUTIFUL NEW DESIGNS
IN PONDEROSA PINE
That will add EXTRA SALES APPEAL to New Homes

You’ll find home sales are easier and faster when you
give your customers the distinctive beauty and character
of Long-Bell Doors. These two new interior designs in
Ponderosa Pine will enhance the personality and appeal
of any room—in any type of house. They are as much at
home in a cozy Cape Cod cottage as in the rambling
Ranch style house.

Long-Bell Doors of Ponderosa Pine or Douglas Fir
are expertly made for easy, time-saving hanging. Quality
materials and precision manufacture give you a door that
lasts a lifetime.

Use Long-Bell Doors to add extra sales appeal to
your homes. There are designs and sizes—distributed
through millwork jobbers—to meet every need.

The Long-Bell Lumber Company
Established 1875 — Kansas City 6, Mo.

DIVISIONAL SALES OFFICES
EASTERN DIVISION • KANSAS CITY, MO.
WESTERN DIVISION • LONGVIEW, WASH.

APRIL 1952
Yes, only ten minutes or less are required to install a BILCO DOOR when you are ready to pour the capping or sidewalls. BILCOS also save countless man-hours during construction by giving free access to the basement.

And remember the advantages to your customer! Only BILCO CELLADOORS give the real basement efficiency that Homeowners want. It's a lifetime investment—economical, trouble-free, burglar and fire-proof.

Write to The Bilco Co., 118 Hallock Ave., New Haven, Conn., for construction facts and the name of your nearest dealer.

CELLADOORS

HERE'S A
SPACE SAVER

DISAPPEARING STAIRWAY

When drawing up plans for homes, utilize the wasted attic space which can be used as storage space, a playroom or an extra bedroom by specifying a Wel-Bilt FoldAway Disappearing Attic Stair. It can be folded up in the ceiling when not in use; thus utilizing valuable space in the house that a permanent stair would occupy. Wel-Bilt FoldAway Stairs can be installed in bedrooms, in kitchens and in small homes at a very nominal cost.

Ask your lumber dealer or write to:

WEL-BILT PRODUCTS COMPANY
P. O. Box 95 Memphis, Tennessee
Raising higher the recognized superiority of Aluminum Windows...

Rustproof • No Painting • Non-Staining
Easily Installed • Trouble-Free • Permanently Beautiful

REYNOLDS ALUMINUM RESIDENTIAL WINDOWS

CASEMENT, FIXED AND PICTURE WINDOWS
with welded joints for greater strength and weather-tightness...carefully assembled from Reynolds own extruded shapes...outstanding for high satin finish. Protectively packaged two to a carton. Complete accessories include Storm Sash and Screens.

DOUBLE-HUNG WINDOWS
Extra-heavy depth...stainless steel hardware...extruded aluminum trim...fully weather-stripped. Spiral precision balances (tape balances optional at extra cost). Supplied unglazed or factory-glazed with neoprene. Shipped ready to install.

AWNINGS WINDOWS
Featuring cross-lap weatherstripping in the tightest, smoothest operating version of this popular window type. Roto-operator opens bottom vent first. Full-open vents deflect both drafts and rain.

Write for catalog showing all types and sizes. Reynolds Metals Company, Building Products Division, 2003 South Ninth Street, Louisville 1, Kentucky.

 Military needs for aluminum limit supply, but Reynolds is rapidly expanding primary capacity. Check your supplier.
Look what you can do
WITH PATTERNED GLASS WALLS

FOR THE DINING ROOM—Satinol® Doublex Glass makes a striking background for art objects. At night, illumination behind the translucent wall floods the room with softly diffused light.

FOR THE ENTRANCE HALL—people get a grand first impression from this interesting pattern of transmitted light, day or night.

FOR THE STAIRWAY—walls become interesting, instead of long, dull surfaces. Daylight from adjoining rooms streams through to flood the stairs.

This idea may suggest ways you can use Blue Ridge Patterned Glass to put more beauty, more sparkle, more livability into houses. It's a use of glass that wins admiration from home buyers. Blue Ridge offers you many beautiful patterned glasses—linear, checkered and over-all patterns, in plain, Satinol and textured finishes. Your L-O-F Distributor can show you samples. *®

WANT DETAIL DRAWINGS OF THESE PANELS? Send for working drawings showing dimensions, framing methods and other pertinent data. Also ask for our 16-page illustrated book of ideas for sparkling up homes with patterned glass. Mail the coupon.

Libbey-Owens-Ford Glass Co.
Patterned & Wire Glass Sales
B-142 Nicholas Bldg., Toledo 3, Ohio

Please send me detail drawings and your illustrated idea book: "New Adventures in Decorating".

Name (please print) ..........................................................

Street..............................................................................

City.................................................... Zone......... State...............
NO DANCING!

Dance only for joy with new, different, better DURALL tension screens!

SAVE TIME! Duralls snap into place from inside your window. 2 easy clamps grip screen to window frame. All in just 9 seconds!

SAVE SPACE! To store Duralls unsnap, roll up, slip into handy cartons, store in nearest closet! Duralls weigh just ounces!

SAVE TROUBLE! Duralls make window washing a snap. Releges two clamps and Durall hangs loose as a shade! So easy to reach outside.

SAVE WORK! Duralls never need painting or weatherproofing. They're rugged and durable. They never rust or stain your house!

SAVE MONEY! Duralls do more, cast less, last longer than ordinary, old-fashioned screens. Write for our Catalog AIA-35-P-1.

DURALL TENSION SCREENS

NEW YORK WIRE CLOTH COMPANY, New Canaan, Conn.

APRIL 1952

PRECISION

the only attic stairway equipped with ROLLER BEARINGS

Life time, factory packed ROLLER BEARINGS make raising and lowering stairway practically effortless.

Precision Parts Corporation, not content with the smoothest and easiest operating stairway on the market, equipped their Precision Folding Stairway with roller bearings for still smoother and easier operation. Actuated by counterweights which operate on these bearings the stairway is practically 100% free of friction and all but raises and lowers itself.

OTHER OUTSTANDING FEATURES:
Constructed of No. 1 kiln dried poplar. Heavy cast aluminum alloy brackets, rocker arms and hinges. Composition safety treads on steps. Door panel insulated with Cellufoam. Requires no attic space. Approved by F.H.A. everywhere.

FOR COMPLETE INFORMATION WRITE OR WIRE US TODAY.

Manufactured by

PRECISION PARTS CORPORATION
402 NORTH FIRST STREET
NASHVILLE 7, TENNESSEE

NEW YORK WIRE CLOTH COMPANY, New Canaan, Conn.
HERE'S WHAT BUILDERS SAY ABOUT

SPOT SASH CORD

For years, builders and architects have used and specified Spot Sash Cord for hanging windows because they have come to know it as "the most durable sash cord on the market."

- TOUGH
- SOLID
- BRAIDED
- COTTON
- WEAR RESISTANT
- Pliable FOR EASY INSTALLATION

Look for the colored spots... your guarantee of quality. In new installations and replacements, use and recommend Spot Sash Cord.

Samson
CORDAGE WORKS
Boston 10, Massachusetts

Exterior Doors...
(Continued from page 132)

N.D. 594
N.D. 591

Above 1 light design N.D. 591 can be divided as in Design N.D. 594 or other divisions are available as listed below:
N.D. 592—3 vert. lts.
N.D. 593—4 vert. lts.

N.D. 620
N.D. 622

Above 1 light design N.D. 620 can be divided as in Design N.D. 622 or other divisions are available as listed below:
N.D. 623—9 vert. lts
N.D. 629—10 vert. lts.
N.D. 628—12 vert. lts.
N.D. 627—15 vert. lts.
N.D. 630—5 hor. lts.

POPULAR SIZES
Nos. N.D. 620, 622
2'-0" x 6'-8", 2'-6" x 6'-8", 2'-8" x 6'-8"

N.D. 608
N.D. 612

POPULAR SIZES
Nos. N.D. 591, 594, 608, 612
2'-6" x 6'-8", 2'-0" x 6'-8", 3'-0" x 7'-0"

REMODEL EASIER, FASTER!
with an EZ-WAY Folding Stairway

Remodel! Modernize! Install an EZ-WAY Folding Stairway to turn waste attic space into useful room for storage, den or bedroom. At nominal cost! See your dealer or write for name of nearest distributor.

EZ-WAY SALES, INC.
A DIVISION OF
MINNESOTA WOOD SPECIALTIES, INC.
BOX 300, DEPT. A * ST. PAUL PARK, MINN.

LOW COST ALL METAL INTERLOCKING EZ-ON WEATHERSTRIP

Easily Installed
No Special Tools Required
RUSTLESS
Moisture-Proof Draft-Proof
Dust-Proof Protection
Complete in Cartons

For Full Details Write Now
ROBERT N. BALTZ & CO.,
1009 Harvard Terrace
Evanston 1, Ill.
Do you ever meet price resistance when selling a porch? Do your customers say, “that’s the right price IF I could use this porch more than two months a year.”

Raymor Windows give you the perfect answer for this customer . . . because Raymor Windows give you both a cool summertime porch AND a warm extra living room in the wintertime.

Here’s why Raymor Windows are better for all seasons. In the summertime they open wide from either top or bottom for coolest comfort. They close quickly and easily to guard against rain, wind or dust.

In the wintertime you can live in your porch with simple winterizing. Even without winterizing, your furniture and rugs are completely protected against snow, cold and wind by weather-tight construction.

**Construction features include:**
1. Extruded, anodized aluminum frames that fit tightly, slide easily and are guaranteed not to rust or corrode.
2. Chemically treated outer frame is part of every Raymor Window unit which means easier installation, plus a guard against moisture rot.
3. Lifetime Lumite screens are used in every unit which means no bulge, no sag, no rust, no break.

Good delivery is assured despite current material shortages.

Do you want more information on the only window of its kind? There is absolutely no obligation, just send in the attached coupon for complete details.

---

**Self-Storing Window Co.**
5901 Wayzata Blvd., Minneapolis, Minn. Dept. "B"

*Gentlemen: Please send me full information on Raymor Windows for porches and breezeways.*

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<thead>
<tr>
<th>Name</th>
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<td>City</td>
<td>State</td>
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**Give Your Customers a More Useful Porch!**
It helps show your customers you build with the best!

Building costs are high—and home-buyers are looking for value. Often a small item, like Lumite* saran screen cloth, says value in a big way... because:

It's a sign that you've built with the best materials.
It's proof you haven't overlooked important minor details.
That's how Lumite plastic screening adds sale-ability to a house!

Longest-lasting screen cloth you can buy!

In actual comparison tests under the worst exposure conditions, Lumite resisted the effects of weather outdoors better than all other kinds of screen cloth! Salt air, humidity, city smoke, acid fumes cannot harm Lumite.

Here are more Lumite advantages:

- strongest, as proven in impact tests
- needs no protective paint or varnish
- does not cause stains
- unharmed by water and almost all chemicals
- can be left up all year 'round
- ideal for every exterior use
- priced right

Sold through Hardware, lumber, and building supply dealers and screen manufacturers.

For free sample and further information:

FOR FREE SAMPLE AND FURTHER INFORMATION:

Lumite Division, Chicopee Mills, Inc.
40 Worth Street, New York 13, N. Y.

Gentlemen: I am interested in the rustproof, stainproof, long-lasting qualities of Lumite saran screen cloth. Please send me free sample and further information.

NAME

COMPANY

ADDRESS

CITY ZONE STATE

Exterior Doors
(Continued from page 134)

Above 1 light design N.D. 635 can be divided as in Design N.D. 638 or other divisions are available as listed below:

| N.D. 636 | 5 v. lts. |
| N.D. 637 | 8 lts., 2 w. |
| N.D. 640 | 10 lts., 2 w. |
| N.D. 641 | 12 lts., 3 w. |
| N.D. 642 | 15 lts., 3 w. |
| N.D. 644 | 3 hor. lts. |

Popular sizes
Nos. N.D. 635, 638
2'-8" x 6'-8", 3'-0" x 6'-8", 3'-0" x 7'-0"

National Woodwork Manufacturers Association Data

Exterior doors come in a variety of constructions, weights, finishes and designs. Nearly every known pattern can now be obtained as a stock unit in a large variety of standard sizes. A number of patterns of stock design are shown, together with a group of flush type doors on which are secured bands of plywood moldings for additional decorative effects.

Trend to Flush Doors

The pronounced trend to flush doors is soundly based on public preference. Architects and builders use them to express the spirit of modernity, with the practical considerations of economy and enduring quality. Flush doors offer great versatility—providing any desired architectural or decorative designs, the popular ranch type, the modern colonial and the solar house.

Where natural finishes are desired, and where particularly severe weather conditions are encountered, doors should be treated with a clear waterproof preparation.

The illustrations that follow on pages 138, 139 and 141 are flush doors to which a variety of moldings have been applied to provide individuality to the front door. These and many other variations can be obtained easily and inexpensively on the job by any carpenter.
Let us send you this book of
HOME BUILDERS
SHORT-CUTS
for FREE five-day trial

More than 800 "practical job pointers" that save time, expense and labor on building jobs.

Now! Carpentry, building construction and building repair jobs are made easier with the practical methods shown in this big 211-page book. Every one of these methods has been TESTED in actual use; every one saves time, saves work, saves money.

Contents include: 88 handy ways to use tools; 37 ideas for work benches and attachments; 62 work-saving ways to use portable equipment; 39 suggestions on excavations, foundations and forms; 32 methods for making sills, girders, joists and sub-flooring; 69 hints on exterior and interior wall construction; 36 short-cuts in roof and bay construction; 19 tips on making cornices and porches; 54 ideas for interior wall covering and trim; 27 helps on stair construction; 37 window suggestions; 54 ideas for installing doors; 29 tips on closets, shelves and built-in equipment; 24 flooring pointers; 35 aids in installing sanitary equipment; 44 short-cuts in laying out work; etc., etc., etc. More than 700 illustrations show you exactly "how-to-do-it." All items indexed so that any particular idea or short-cut you want can be located instantly.

SEND NO MONEY Examine 5 Days FREE
Just fill in and mail coupon below to get "Practical Job Pointers" for 5 DAYS FREE TRIAL. If not fully satisfied, return the book and owe nothing. If you keep it, send only $3.50 plus few cents postage in full payment. You take no risk. Mail coupon below, now.

APRIL 1952

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Name ____________________________
Address __________________________
City __________________ Zone ______ State ______

April 1952
ADD-A-ROOM
WITH THE
BESSLER DISAPPEARING STAIRWAY

Our stairways have been on the market for 35 years.
Taking up no space in the room below.
Folds up into the ceiling.

Write today for literature and details.

THE BESSLER DISAPPEARING STAIRWAY CO.
1900 E. Market St.
Akron 5, Ohio

WEATHER-BLOC
The Original
Single Unit VENTILATOR FOR GLASS BLOCK PANELS

NO SACRIFICE OF BEAUTY OR PRIVACY
* Controlled Ventilation
* Stainless Steel Body

WEATHER-BLOC is available in 3 models in all standard glass block sizes. STANDARD—glass louvers outside and inside. UTILITY—stainless steel louvers outside and glass louvers inside. ECONOMY—stainless steel louvers outside and inside, 6 and 8 inch sizes only.

WEATHER-BLOC is engineered for use in Homes, Stores, and Offices. The outside presents a series of horizontal louvers which blend with glass block. The two louvers on the inside can be closed or opened to any degree with the flip of a finger, thus controlling the flow of air either upward or downward to any desired degree. Aluminum screen inside.

Purchase Through Your Glass Block Dealer or Jobber Nationally Distributed by WINGO DISTRIBUTING & MFG. CO., Inc.
353 Bittner Street, St. Louis 5, Mo.

AMERICAN BUILDER
HOW TO SAVE CASH...

INSTALL SUN-SASH!
Costs Less than Ordinary Windows

Everyone is talking about the new Sun-Sash "air controlled" louvred windows! This beautiful modern window is rapidly becoming the "new look" in window design. Sun-Sash offers outstanding features that no other window can give . . . and at lowest cost.

Sun-Sash windows can be used anywhere throughout the home, in offices, factories and institutions. Millions are now in use! And remember for more beauty . . . more comfort . . . more features . . . specify Sun-Sash—the new idea in windows!

1. Screw or nail Sun-Sash fittings
2. Slide in Glass louvres
3. Close end of clips over glass
4. Install ½" stops for snug fit.

Mail this coupon now for more details and colorful descriptive literature on Sun-Sash:

SUN-SASH COMPANY
38 Park Row, Dept. 2
N.Y. 7, N.Y.

Name
Address
City
State
Occupation

Exterior Doors...

(Continued from page 138)

Dealers everywhere are lining up with New Monarch and selling their Genuine In-A-Slide all-steel basement windows, truly the best buy in quality windows today.

Heavy steel, press-formed channel construction—double weather protection—ease of installation—instant removability of sash—all these and many other Monarch engineered features have made In-A-Slides FIRST CHOICE among alert dealers and contractors.

The amazing yearly increase in In-A-Slide sales means BIGGER AND BETTER DEALER PROFITS.

MULLIONS
Used with Standard In-A-Slides, Monarch Mullions make sturdy multiple utility window units of from 2 to 6 to a section. Fit wall openings of various sizes.

SUN-SASH MATCH

Sold Through Dealers Only

When you think of Discount Windows—think of NEW MONARCH MACHINE & STAMPING CO.

APRIL 1952
perfect balance! fast, easy installation!

the new CENCO...

• Wide variety of sizes
• Weather tight
• Enclosed springs
• Simplified framing

COMBINATION WEATHER-STRIP SASH BALANCE

Here is the new Cenco sash balance with everything you need for fast easy installation. You get many standard sizes to choose from, and simplified framing to make your job easier—more profitable. This balance is weather tight and perfectly balanced with the correct weight spring for each size—giving long, trouble free operation. Write for complete data including sizes and prices. Immediate delivery!

CENTRAL METAL STRIP CO.
4343 No. Western Ave.—Chicago 18, Illinois

Complete line of weatherstrip materials and supplies

TO BUILD BETTER USE
PETE R S O N
ALUMINUM WINDOWS

8 BIG ADVANTAGES

1. ARCHITECTURAL APPEAL—wide sliding glass panels provide streamlined beauty giving new approach to building design.
2. CLEANLINESS—sliding sash removes into room for easy washing. Minimum will not stain adjacent building surfaces.
3. SAFE—sights locking in closed and one, two and three sash open positions, ideal for first floor doors.
4. STURDY—tubular construction gives extra strength and together with weatherstripping provides insulating draft free comfort.
5. BILLS OPEN—effortless horizontal operation gliding on stainless steel rollers.
6. ADVANCED DESIGN—eliminates putty, such blemishes operating cords and springing hinges.
7. NO PAINTING EXPENSE—aluminium harmonizes with all building materials, never rots or rusts and cannot swell, warp or drip.
8. FURNISHED COMPLETE—designed to accommodate screens and double glazing panes (extra size) as an integral part of the window, eliminating its streamlined beauty.

Write for free catalogues.

PETERSON Window Corporation
1353 East 8 Mile Road
Ferndale 20, Michigan

FIRST—Leaf through the book from cover to cover and get the general layout in mind. This will enable you to use it sufficiently later on. The 5 Directory Sections are printed on colored stock for easy identification. If you are looking for the answer to a specific building problem, consult the index for the particular Product Reference Section you want. These sections tell you who makes it and how to use it.

1. Building Products and Equipment Manufacturers

An alphabetical list of products and equipment listed under appropriate titles. No cross references to delay or confuse you.

2. Brand Names

If you know the brand name but not the maker, you can find the name of the manufacturer here.

3. Names and Addresses of Manufacturers

This section completes your Buying Guide by listing the principal manufacturers in alphabetical order.

4. Industry and Allied Professional Trade Assns.

A valuable addition that saves you a lot of time when you want the name and address, and principal offices of local or national associations.

5. List of Participating Communities in 1951 National Home Week

An alphabetical list by states of communities that have taken part and cashed in on the promotional value of National Home Week. Look and see if your community is listed.

If you have a special building problem—write us. Our editors have the knowledge and experience to be of real help to you. Don't hesitate to write. No obligation, of course.

AMERICAN BUILDER
79 W. MONROE ST. CHICAGO 3, ILL.
WHEN CUSTOMERS ASK...

"What's New and Best in Windows?"

BE PREPARED!

Show them why it pays to be Gate City Awning - Window - Wise!

AVAILABLE in stock sizes and styles to fit every need.
DELIVERED to the job completely assembled, including hardware, glazing and weatherstripping.
ECONOMICAL to warehouse and handle.
AN EASY TO INSTALL, preservative-treated WOOD Window.
PRICED RIGHT...of course!

GATE CITY SASH & DOOR CO.
"Wood Window Craftsmen Since 1910"
P.O. Box 901, Fort Lauderdale, Florida
MEMBER OF THE PRODUCER'S COUNCIL, INC.
Refer to Sweet's Builders' File 4-d GA

Try this new way to "CLIPPING COUPONS" on window profits. Send for complete information

NOW!

GATE CITY SASH & DOOR CO.
P.O. Box 901, Fort Lauderdale, Florida

(Continued from page 131)

The ONE for your Job
One-der metal door frame

Solid Welded Mitres
Double Stud Anchor Clips
Brass Strike
Rat Sill Knee
Prime Coated at the Factory

Installed Easily, Rapidly and at Lower Cost

Also, One-der Window Frame

One-der Frames work readily with all conventional forms of construction. There is no job-site assembly, no pieces to put together, no extra material to buy, no finish carpenter labor. Whatever your job, you will profit by using One-der Frames.

ONE-DER FRAME Corporation
2109 Third Avenue, North
Birmingham 3, Alabama

APRIL 1952
Laboratory tests prove that Bilt-Well Superior Windows have almost double the weathertight efficiency required by the American Wood Window Institute's Specification.

And, although Bilt-Well Superior Windows fit snugly, they open easily and quietly and slide smoothly under all weather conditions.

This unusual ease of operation is due to the patented Superior flexible Jamb-liner Weatherstrip which regulates the snug fit. In addition, the window is counterbalanced.

And, for you who are close to the building industry, here's special news! Bilt-Well Superior Windows are now adjustable to various wall thicknesses. See illustrations. Write us for further information.

CARR, ADAMS & COLLIER CO.
Dubuque, Iowa

See our products in
Sweet's Architectural Catalog pages 248/CA and 17C/CA
Here's a list of the BILT-WELL LINE
Superior Unit Wood Windows • Exterior & Interior Doors • Entrances and Shutters • Closet Case-ments • Carr-dor Garage Doors • Basement Unit Windows • Louvers & Gable Sash • Combination Doors • Screens & Storm Sash • Corner (China) Cabinets • Ironing Board Cabinets • Mantels & Telephone Cabinets • Nu-Style & Multiple-Use Cabinets • Stair Parts.
Attractive cabinet and fireplace hardware harmonizes with the design of this room.

Hardware is an important sales aid. Automatic window operators, weather stripping, hardware which makes windows easy to open, easy to clean and efficient in ventilation, are all talking points. Doors hung on good hinges so that they will operate at a touch of the finger, quietly and easily, appeal to the housewife with small children. Push plates and escutcheon plates which make it easier to keep walls and woodwork clean also appeal, as do bathroom door locks which can be opened from the outside so that Junior can't lock himself in.

A house built to shout "quality" as you walk up to the front door gives the prospect a definite let-down when he takes hold of a cheap-appearing door knob, notices an indifferent lock, has trouble opening the door because it doesn't hang well on the hinges, and finds cheap trim used where good trim belongs. The effect of the finest layout of kitchen cabinets is spoiled when Mrs. Prospect pulls open a cabinet drawer and scratches her hand on a poorly-finished handle.

The use of high-quality fittings and hardware, well-designed shelf brackets, casters, latches, snaps, chains and guards for doors, door stops, door closers, bathroom fittings, clothes hooks and other wardrobe fittings, as well as appropriate decorative trim and venetian blind or drapery fittings—all add in a thousand ways to the prospect's appreciation of the value of the property.

While impressed with modern design and efficient layout for comfortable living, prospects generally think in terms of the house built to last a hundred years. It is, of course, easier to point out structural features to a buyer who visits the house when it is under construction. Nevertheless, explanation of how heavy sash bolts are used to tie the frame to the foundation and how special truss fasteners, wall ties, sheathing nails, window-frame anchors, and other hardware items are used, will help to build appreciation for the "house that's built to last."

Specialties Help Sell, Too

The house with attached garage is now so common that much attention is paid by buyers to the problem of opening and closing garage doors. There are a number of manufacturers who have special hardware for this purpose, the easy functioning of which is a sales point for the builder. Combination screen and sash or storm door hardware, extra heavy hinges for some special purpose door, electric window and door operators,
package or mail receptacles, and similar features are hardware items which add little to the total cost of the house but much to its salability.

When you use hardware as evidence of value, talk function. Explain that the locks and latches on the various doors were selected for certain special features of operation. Point out that finish hardware was selected to match the decorative scheme of the house, that it is easy to maintain and of a type easily replaced when necessary. Demonstrate throughout that the hardware used is not just "window-dressing" but represents function combined with beauty to increase the livability of the house.

**Locks**

Exterior doors require security-type locks, generally fitted with pin tumbler lock mechanisms. Front entrances may have handle-and-thumb levers for better appearance. Available for doors of contemporary design is a lockset having a longer backset, placing the knob five to seven inches away from the door edge.

Locks for interior doors are made for both key and push-button operation for privacy in bedrooms and bathrooms. Access may be obtained in emergencies by screwdriver or pin releases. Special knob and lock assemblies are available for closet and locker doors, storerooms, roof decks, French doors, and other one- or two-side locking requirements.

In addition to locks mortised into the lockstiles of doors, the home builder may be called upon to supply night latches and dead locks, and occasionally padlocks. A wide variety of choice is available.

Cylindrical and tubular locksets have been designed for ease and economy of installation. Round holes are drilled for both lock and knob assemblies, and a minimum of mortising or routing is necessary for strike plates and lock plates. Adjustable mechanisms enable easy fitting to doors of different thicknesses, and installation costs are held to a minimum.

Most of these locksets have the lock mechanism in the center of the knob. Turn buttons or push buttons provide for locking from the inside on bathroom doors, etc.

In metropolitan areas, the use of a night or dead latch is often felt to be desirable for additional security. These should be of best quality.

**Door Fittings**

Door fittings will include such items as door closers, hinges, pulls and finger latches for sliding doors, and the like. The door fittings selected for a job depend on the type of doors used, the style of architecture, the price range of the building, and customer preferences.

Door closers are desirable for exterior doors. Relatively expensive, they will be omitted in lowest-cost housing, but should be suggested as an extra in housing for moderate to higher price levels.

Door hinges for interior and exterior use—butt hinges—should be selected to match the thickness of the doors. The clearance of the door away from the trim must also be considered, as must the “hand” of the door (right or left hand opening) so that correct hinges for the particular doors are available on the job at the right time and place.

Hinges are made in medium and heavy weights. The heavy weight hinges are for factory, apartment building and industrial use, and will not ordinarily be required in small homes and light building construc-

Medium weight hinges are made in both plain bearing and ball bearing types. Special hinges are available for metal door casements and metal doors; when these are used, care must be taken to select correct hinges if they are not provided by the manufacturer of the door units.

**Door Knobs, Handles, Pulls**

Push plates, pulls and miscellaneous door trim are generally supplied by the same source as that used for locksets, so that the entire door trim will match or be in harmony throughout the building. Most manufacturers provide complete assortments of this type of hardware in a wide selection of styles and finishes, so that selection, once a particular design or type (Continued on page 147)

**Kitchen cabinet hardware is available in wide variety of styles to match fixtures**

Door closers should not be overlooked as a sales point. Freedom from slamming and control of drafts are desirable.
GIVE CUSTOMERS' HOMES AND YOUR REPUTATION THE BEST PROTECTION POSSIBLE!

--SARGENT LOCKS!

FOR ENTRANCE DOORS -- SARGENT INTEGRA-LOCKS with the SENTRY BOLT

Sargent Integra-Locks give exterior doors—front and back—lifetime beauty...lifetime protection.
They give lifetime convenience, top—with key-in-knob action.
Your customers will appreciate your recommending and installing Sargent Integra-Locks on exterior doors for many reasons.
There is the exclusive Sargent SENTRY BOLT which gives added security, as shown above.
It is released, along with the latch, by just a quarter turn of the key.

Also remember this great "4500" lock feature: It has a full ¼" throw.
The bolt will travel the full distance every time. Separate spring for the latch bolt insures smooth forceful latching action—twin springs for knob hub create balanced knob performance.
No other lock in its price class has so many features!
No wonder the "4500" lock leads among bored-in locks!

There's the unique Shear Pin in the knob of the Integra-Lock.
It breaks when subjected to extreme torsion causing the knob to spin harmlessly...but allowing a key owner to operate it.
There are these other Integra-Lock features that add up to the best possible protection today: features such as interchangeable precision parts...compact factory-assembled, factory-sealed lock cases...self-lubricating OILITE bearings. Easy installation. (Practically impossible to install incorrectly.)

FOR OTHER DOORS -- SARGENT "4500" LOCKS

Sargent "4500" locks not only give your customers the original tulip shaped knob but also offer a variety of operations such as those required for bathroom, passage and bedroom doors. A genuine pin tumbler cylinder function where security is needed.
They have quality in every detail. Are beautiful in design...match harmoniously with design of the Integra-Lock...make a handsome installation.
Quick and easy to install, too...needs only a 1¼" crossbore.

Also remember this great "4500" lock feature: It has a full ¼" throw.
The bolt will travel the full distance every time. Separate spring for the latch bolt insures smooth forceful latching action—twin springs for knob hub create balanced knob performance.
No other lock in its price class has so many features!
No wonder the "4500" lock leads among bored-in locks!

Sargent Screen Door Hardware is built for lifetime service.
The Sargent Screen Door Closer takes up little space—only 2¼ inches between doors. Easily installed on practically any installation. Adjustable spring lets door close surely, quickly, quietly...with control of spring power. Suitable for heavy duty use.
Sargent Screen Door Catches are simply applied by merely boring two holes...give easy action...keep doors shut tight. Lock from inside.
So check your screen door hardware requirements—and order SARGENT.

For full information about Sargent Locks and Sargent Screen Door Hardware ask your supplier...or write us. Dept. 5C.

Sargent and Company
New York • New Haven, Conn. • Chicago
Builders Hardware and Fine Tools since 1864
THE ROCKET 1000
HAS EVERYTHING!

NEW-LOW COST-PACKAGED
SLIDING DOOR HANGER

3 MODELS

No. 1040 SERIES
For By-Passing Multiple Doors up to 1 1/4" thick. (50 lbs. per door)

No. 1030 SERIES
For By-Passing Multiple Doors up to 1/2" thick. (50 lbs. per door)

No. 1020 SERIES
For Single Sliding and Bi-Parting Door Installations. (all door sizes to 50 lbs. per door)

LOW PRICE

Priced for quick turnover, ROCKET Hardware is Quality Hardware at down-to-earth prices. Write today for complete Price List!

DEALER AIDS!

Merchandising material includes stuffers, ad mats, catalogue sheets, broadsides, window streamers. Powerful trade and consumer advertising. Working models for your counter or shelf!

PACKAGED!

ROCKET Hardware is packaged in bright red, eye-appealing tubes. Color coded labels result in spin-off selection of proper hardware by dealer. It's both profitable and convenient to stock and sell ROCKET Hardware.

Write today for immediate action from your supplier!

GRANT PULLEY & HARDWARE CO.
31-89 Whitestone Parkway, Flushing, L.1., N.Y.
of hardware is established, is no problem.
Knobs for cabinets, especially built-in cabinets in living and dining rooms or areas, should also be in harmony as to style and finish. If brass is used as the finish for locksets and knobs, the remaining accessory hardware should have this finish. Kitchen cabinet hardware, however, is usually chrome-plated regardless of the finish used throughout the rest of the house. Other door hardware, which should be considered at the time the selection of locksets is made, will include such items as stops and checks, base knobs, push and kick plates, and chains and guards as a possible substitute for night latches.
Screen door closers are usually of light construction, operated by an air check device instead of the hydraulic mechanism of the regular closer for heavier doors, and need not be of finish to match. Standard screen door closers are adjustable, right or left.
Push plates on double acting doors, while they may be omitted, are one of the extra touches that give the builder an opportunity to demonstrate the excellence of his products at little additional cost. Glass, polished brass, and chrome-plate push panels are suitable for any type of trim, and require little installation expense.

The front door kick plate is another “extra” that may either be provided or omitted. Brass is durable but requires constant polishing to look well. Chrome needs no maintenance but may become scratched and pitted after continued use.

Weather stripping has been raised from the accessory class into a “must” in present-day home building. The buying public has been educated on the virtues of insulation and heat control in homes as a fuel-saving and draft-preventing measure. Weather stripping is equally important.
Base stops should be installed for wall protection at any point where doors are omitted, are one of the buying public’s touches that give the builder an opportunity to demonstrate the excellence of his products.

### DOOR SCHEDULE

<table>
<thead>
<tr>
<th>PLAN NO.</th>
<th>LOCATION</th>
<th>LOCK</th>
<th>TRIM</th>
<th>FINISH</th>
<th>HINGES</th>
<th>OTHER ITEMS</th>
<th>NOTES</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Front (1½” thick)</td>
<td>Cylinder</td>
<td>Handle Set—Outside</td>
<td>PB</td>
<td>Three 4” x 4” (Prime finish)</td>
<td>Doorbell, Mail Receiver, Threshold,</td>
<td>All cylinder locks for all exterior doors (overhead garage door included) and night latch to be keyed alike</td>
</tr>
<tr>
<td>2</td>
<td>Service (1½”)</td>
<td>Cylinder</td>
<td>Knob Set—Interior</td>
<td>PB—Exterior PC—Interior</td>
<td>Three 4” x 4” (Prime finish)</td>
<td>Doorstop</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Overhead Garage</td>
<td>Cylinder</td>
<td>Night Latch &amp; Latch Set</td>
<td>PB</td>
<td>Three 4” x 4” (Prime finish)</td>
<td>Overhead hardware by contractor</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Garage (1½”)</td>
<td>Latch Set</td>
<td>Knob—Outside Lever—Inside</td>
<td>PB</td>
<td>Three 3” x 3” (Galvanized; brass pins)</td>
<td>Door Check and Safety Chain, Solid brass important</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Combination Storm—Screen—Two Doors</td>
<td>Latch Set</td>
<td>Knob—Room Side Spindle—Inside</td>
<td>PB</td>
<td>Three 3½” x 3½” (Prime finish)</td>
<td>Doorstop</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Coat Closet (1½”)</td>
<td>Bath Set</td>
<td>Knob—Outside Lever—Inside</td>
<td>PB</td>
<td>Three 3½” x 3½” (Prime finish)</td>
<td>Doorstop, Emergency key for lock</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Bathroom (1¼”)</td>
<td>Latch Set</td>
<td>Knob Set—Outside PC—Bathroom</td>
<td>PB</td>
<td>Three 3½” x 3½” (Prime finish)</td>
<td>Doorstop</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Bedroom (1½”)—Two Doors</td>
<td>Latch Set</td>
<td>Knob Set—Outside PB</td>
<td>Three 3½” x 3½” (Prime finish)</td>
<td>Doorstop</td>
<td></td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Sliding Closet (1½”)—Two Pairs</td>
<td>Mortised Pulls</td>
<td>PB</td>
<td>Three 3½” x 3½” (Prime finish)</td>
<td>Checking Floor, Push-plates</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### CABINET SCHEDULE

<table>
<thead>
<tr>
<th>PLAN NO.</th>
<th>LOCATION</th>
<th>LOCK</th>
<th>TRIM</th>
<th>FINISH</th>
<th>HINGES</th>
<th>OTHER ITEMS</th>
<th>NOTES</th>
</tr>
</thead>
<tbody>
<tr>
<td>11</td>
<td>Linen Door (1½”)</td>
<td>Friction Catch</td>
<td>Pull</td>
<td>PB</td>
<td>Three 4” x 4” (Prime finish)</td>
<td>Doorbell, Mail Receiver, Threshold,</td>
<td>All cylinder locks for all exterior doors (overhead garage door included) and night latch to be keyed alike</td>
</tr>
<tr>
<td>12</td>
<td>Kitchen</td>
<td>Friction Catch</td>
<td>Pulls</td>
<td>PC</td>
<td>Door Check and Safety Chain, Solid brass important</td>
<td></td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>Bathroom</td>
<td>Friction Catch</td>
<td>Pulls</td>
<td>PC</td>
<td>Door Check and Safety Chain, Solid brass important</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### WINDOW SCHEDULE (Type and Number Required)

<table>
<thead>
<tr>
<th>PLAN NO.</th>
<th>LOCATION</th>
<th>LOCK</th>
<th>TRIM</th>
<th>FINISH</th>
<th>OTHER ITEMS</th>
<th>NOTES</th>
</tr>
</thead>
<tbody>
<tr>
<td>14</td>
<td>Double Hung (13)</td>
<td>Sash Locks</td>
<td>PB or PC depending on location</td>
<td>Bar Lifts</td>
<td>Manufacturer's hardware supplied by contractor</td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>Casement (1)</td>
<td>Sash Locks</td>
<td>PC</td>
<td>Bar Lifts</td>
<td>Manufacturer's hardware supplied by contractor</td>
<td></td>
</tr>
<tr>
<td>16</td>
<td>Storm Sash (12)</td>
<td>Hooks and hangers supplied by contractor</td>
<td>Ventilating devices where desired</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>17</td>
<td>Screens (12)</td>
<td>Hooks and hangers supplied by contractor</td>
<td>Ventilating devices where desired</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### MISCELLANEOUS — Closet Accessories (Clothes hooks, hat racks, shoe holders)

University of Illinois Small Homes Council
BEHIND THESE BEAUTIFUL WALLS
AND THOUSANDS OF OTHERS
Throughout the Country...

YOU'LL FIND GEMCO PRODUCTS
That Saved Many Man-Hours
and Cut Building Costs!

Because labor time is such a vital factor today,
more and more builders are using Gemco products...
eliminating the slow, hazardous jobs of drilling for
anchorage to brick, tile, concrete, and steel. You, too, can
save many man-hours and cut costs on residential, com-
mercial and industrial buildings the Gemco way.

GEMCO ANCHOR NAILS
...for installing furring strips,
plaster grounds, carpet strips, etc.
Fastened to surface with approved
adhesive, they have ample strength
to hold sidewall loads in place
securely. Easy to install; anchoring
is sure, safe, permanent.

GEMCO ANCHOR BOLTS
...for quick, easy installation of
metal cabinets, outlet boxes, dis-

densers, mailboxes, etc., on concrete,
brick, steel, hollow tile, gypsum tile.
No drilling or welding.

GEMCO Insulation Hangers
...ideal for installing batt-type in-
sulation on concrete, brick, or metal.
Many man-hours are saved over
welding of wires or installing me-
chanical fasteners.

Other Goodloe E. Moore, Incorporated, products: TUFF-
BOND outstanding adhesives ... super-strength ... water-
proof ... sticks almost anything to anything. TUFF-TRED
Safety Stair Nosing ... for protecting any type stair steps
from wear, improving the safety factor, maintaining and
restoring stairway beauty. Write, phone, wire...

GOODLOE E. MOORE
INCORPORATED
DANVILLE, ILLINOIS

In Canada: W. D. ELMUS, Ltd.
409 Notre Dame St., West, Montreal 11, Quebec

HOW TO DETERMINE SIZES
OF BUTT HINGES

Door sizes given are jamb opening dimensions.

<table>
<thead>
<tr>
<th>Thickness of Doors in inches</th>
<th>Width of doors or height of transoms in inches</th>
<th>Height of butt hinges (length of joint), inches</th>
</tr>
</thead>
<tbody>
<tr>
<td>3/4 and 7/8 cupboard doors</td>
<td>To 36</td>
<td>3/4</td>
</tr>
<tr>
<td>7/8 and 1 1/4 screen doors</td>
<td>To 36</td>
<td>3/4</td>
</tr>
<tr>
<td>1 1/4 doors</td>
<td>To 32</td>
<td>3/4</td>
</tr>
<tr>
<td>1 1/4 and 1 3/4 doors</td>
<td>Over 32 to 37</td>
<td>3/4</td>
</tr>
<tr>
<td>1 1/4, 1 3/4, and 1 7/8 doors</td>
<td>Over 32 to 37</td>
<td>4</td>
</tr>
<tr>
<td>2 1/4 and 2 1/2 doors</td>
<td>Over 32 to 37</td>
<td>5 Extra heavy</td>
</tr>
<tr>
<td>2, 2 1/4 and 2 1/2 doors</td>
<td>Over 43 to 50</td>
<td>6 Extra heavy</td>
</tr>
<tr>
<td>1 1/4 and 1 3/4 transoms</td>
<td>Over 43 to 50</td>
<td>6 Extra heavy</td>
</tr>
<tr>
<td>1 1/2, 1 3/8, 1 7/8 and 1 15/16 transoms</td>
<td>Over 20 to 36</td>
<td>3</td>
</tr>
<tr>
<td>2 butt hinges</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Doors 60 inches high and under</td>
<td></td>
<td>2 butt hinges</td>
</tr>
<tr>
<td>Doors over 60 inches high and not over 90 inches high</td>
<td></td>
<td>3 butt hinges</td>
</tr>
<tr>
<td>Doors over 90 inches high and not over 120 inches high</td>
<td></td>
<td>4 butt hinges</td>
</tr>
<tr>
<td>Transoms 48 inches wide and under</td>
<td></td>
<td>2 butt hinges</td>
</tr>
<tr>
<td>Transoms over 48 inches wide and not over 84 inches wide</td>
<td></td>
<td>3 butt hinges</td>
</tr>
</tbody>
</table>

GOODLOE E. MOORE
INCORPORATED
DANVILLE, ILLINOIS

In Canada: W. D. ELMUS, Ltd.
409 Notre Dame St., West, Montreal 11, Quebec

HOW TO DETERMINE TRIM
CLEARANCES FOR BUTT HINGES

The table below lists clearances for trim of regular stock
size butt hinges for wood or hollow metal doors. The

clearance is estimated on butt hinges set back 1/4 inch
for doors up to 2 1/2 inches and 3/4 inch for doors 2 1/2
to 3 inches in thickness. Where trim presents a specific
problem in determining the proper width of the butt hinges
for a door, take twice the thickness of the door, plus the
thickness of the trim and deduct 1/16 inch for doors up to 2 1/2
inches in thickness, and 3/4 inch for doors 2 1/2 inches to 3
inches in thickness. The result will give the proper width at
hinge to allow the door to open at 180°. Should the result
come out uneven, use the next regular stock size.

<table>
<thead>
<tr>
<th>Thickness of Door</th>
<th>Size of Butt Hinge</th>
<th>Maximum Clearance</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Inches)</td>
<td>(Inches)</td>
<td>(Inches)</td>
</tr>
<tr>
<td>1 1/4</td>
<td>3 x 3</td>
<td>1/4</td>
</tr>
<tr>
<td>3 x 3</td>
<td>1/4</td>
<td></td>
</tr>
<tr>
<td>1 3/8</td>
<td>4 x 4</td>
<td>1/4</td>
</tr>
<tr>
<td>4 x 4</td>
<td>1 1/4</td>
<td></td>
</tr>
<tr>
<td>1 3/8</td>
<td>4 1/4 x 4 1/4</td>
<td>1 1/4</td>
</tr>
<tr>
<td>4 1/4 x 4 1/4</td>
<td>1 5/8</td>
<td></td>
</tr>
<tr>
<td>5 x 5</td>
<td>2 1/4</td>
<td></td>
</tr>
<tr>
<td>6 x 6</td>
<td>2 1/4</td>
<td></td>
</tr>
<tr>
<td>1 1/2</td>
<td>4 1/4 x 4 1/4</td>
<td>1 1/4</td>
</tr>
<tr>
<td>4 1/4 x 4 1/4</td>
<td>1 5/8</td>
<td></td>
</tr>
<tr>
<td>5 x 5</td>
<td>2 1/4</td>
<td></td>
</tr>
<tr>
<td>6 x 6</td>
<td>2 1/4</td>
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<tr>
<td>2</td>
<td>4 1/4 x 4 1/4</td>
<td>1 1/4</td>
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<tr>
<td>4 1/4 x 4 1/4</td>
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<td>6 x 6</td>
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<tr>
<td>2 1/4</td>
<td>5 x 5</td>
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<td>6 x 6</td>
<td>1 1/4</td>
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<tr>
<td>6 x 8</td>
<td>3/4</td>
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</table>

HOW TO DETERMINE SIZES
OF BUTT HINGES

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<td>Over 32 to 37</td>
<td>5 Extra heavy</td>
</tr>
<tr>
<td>2, 2 1/4 and 2 1/2 doors</td>
<td>Over 43 to 50</td>
<td>6 Extra heavy</td>
</tr>
<tr>
<td>1 1/4 and 1 3/4 transoms</td>
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GOODLOE E. MOORE
INCORPORATED
DANVILLE, ILLINOIS

In Canada: W. D. ELMUS, Ltd.
409 Notre Dame St., West, Montreal 11, Quebec
The trend is to small homes today. And with this trend comes the necessity of utilizing every available inch of space. That's where the Richards-Wilcox Vanishing Door Hardware comes in. Specially designed for thin wall construction, noiseless operation and easy installation, they help make a room livable from wall to wall. R-W Silver Streak Vanishing Door Hangers and Aluminum Track are constructed for flexibility—for use on single or parallel wardrobe doors, or for sliding doors in any room.

Check these important points!

- Four types of hangers to accommodate various size doors and building requirements.
- Adapted to single sliding and parallel sliding house doors.
- Adapted to thin walls to save space and reduce building costs.
- Aluminum Track
- No interference with room furnishings or decorations.
- Tight fit of door to floor avoids drafts, loss of heat.
- For more information, contact our nearest office or request one of our illustrated folders describing in detail the uses and advantages of SILVER STREAK.

(Continued from page 147)
Here are a few of the many Lockwood items that are showing contractors important savings on installation costs. At the same time, they give the owner attractive hardware that assures him of long, trouble-free service.

**STANDARD DUTY KEY 'N KNOB SET . . .**
**FOR HOMES, APARTMENTS AND OTHER LIGHT CONSTRUCTION**
Made only of the finest materials. Designed for fast, economical installation. An exclusive Lockwood feature permits easily equalized knob projection on doors 1¼" or 1½" thick. Made in a range of functions to cover all locking requirements.

**BOR-A-LIGN LOCKSET . . .**
**FOR ECONOMICAL INSTALLATION ON LOW COST HOUSING**
Steel aligning units guarantee free working assembly of knobs, trim and lock on door. Machine screws clamp set firmly in position. Made with functions for passage doors, without locking feature, and with privacy locking button inside, for bath and bedroom doors.

**LOCKWOOD HARDWARE MANUFACTURING COMPANY**
**FITCHEBURG • MASSACHUSETTS**
**APRIL 1952**
CORBIN HARDWARE

"Sa...a-ay!
that's a Corbin Lock!!"

Handsome Appearance
...Fine "feel"
...nationally known!

CORBIN TUBULAR LOCK

Choice of careful builders everywhere...because it's a smart combination of quality with economy. For interior and exterior doors.

Montgomery

LOCKSET

A classic design that helps make that first impression a good one!
New homes sell quicker when buyers spot extra-quality touches—like the CORBIN name on hardware! It's a good reflection of the thought and quality you've expended on the entire house . . . and buyers know it, because Corbin hardware is backed by an impressive national advertising program.

Corbin hardware has a handsome appearance . . . a fine "feel" . . . and will give years and years of dependable security.

You'll find it's true—Corbin Hardware is an important part of your quality picture . . . adds little or nothing to your cost picture.

Always insist on Corbin hardware in the homes you build.

---

PRESSURE-CAST ALUMINUM HARDWARE BY CORBIN

---

BE SURE OF LIFETIME DEPENDABILITY—
WITH CORBIN QUALITY!

---

GOOD BUILDINGS DESERVE GOOD HARDWARE

P. & F. CORBIN Division
The American Hardware Corporation
New Britain, Connecticut, U. S. A.

---

APRIL 1952
balance units reduce the space requirements for otherwise lost space.

A variation of the spring balance provides balancing action which is supplied by a coiled spring in a vertical tube, operating a spiral lift; this type is efficient in operation and is concealed completely in the casing.

**Window Handles and Lifts, Sash Hardware**

Window lifts and handles, if not painted to match the woodwork, should be in keeping with the design and finish of the rest of the room hardware. Other sash hardware such as locks, bolts, adjusters, etc., should be chosen from the viewpoint of most efficient operation and best quality. Screen hangers, corner braces, and hangers, braces, and adjusters for storm sash should all be supplied and installed properly.

(Continued from page 150)

Shutter Hardware

Many of today's popular styles of architecture feature shutters both for beauty and weather control. Shutter hinges are available in utility and decorative styles, finished to be weather-resistant and maintain appearance over long life.

**Casement Hardware**

Casement-hung windows require the best quality adjusters, hinges, and fasteners for continued ease of operation and weather-tightness against wind and water. While metal casement windows usually have operating mechanisms and hinges supplied as a part of the window assembly, the builder using wood casement sash will find equally efficient hardware available. Extension-type hinges allow both sides of the window to be reached for easy cleaning, and pro-

(Continued on page 158)
Acceptance of WESLOCKS by architects, builders and lending institutions for use on many of the nation's largest building projects is evidence of the outstanding values the line offers. For example, all WESLOCKS have an easy spring latch with a light spring for the bolt and heavy-tension knob return—a feature found only in the most expensive locks. Also, WESLOCKS have key-in-knob construction, 5-pin tumbler locking mechanism for maximum security, split spindle, independent knob operation, factory assembled units, self-aligning feature and a wide choice of handles, ornamental escutcheons and finishes.

Best of all, WESLOCKS are priced to meet the most modest budgets. Truly, they offer you the best hardware value at any price. Send today for catalog.
Door Hardware

Locks and Hinges

Functional Lock Types

Security: Bit-key locks on rear and side doors provide the means for most illegal entries. Many bit-key locks can be easily picked or opened with a ten-cent skeleton key. They are not safe for outside doors without a separate dead bolt lock.

Cylinder locks insure against burglary and should be installed on all exterior doors used for entry by the family — not just the front door. Other exterior doors may be safeguarded with bolts which operate only from the inside.

Convenience: All cylinder locks used for one house (including garage) should be keyed alike — ordered to operate with the same key.

A cylinder dead lock on one closet permits prized possessions to be locked up during the owner’s absence.

Economy: Bedroom and some closet doors can be "trimmed" with latch sets, thus saving the cost of unnecessary key locks. Closet doors generally need knobs on the room side only; spindles, on the closet side.

### Types of Door Sets and How They Are Installed

<table>
<thead>
<tr>
<th>Type of Door Set</th>
<th>How They Are Installed</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Preparing The Door</strong></td>
<td>No Bit Key Adaption</td>
</tr>
<tr>
<td><strong>Bit-Key Cylinder</strong></td>
<td>Cylinder Adaption</td>
</tr>
<tr>
<td><strong>Bath Set</strong></td>
<td>Bath Key Adaption</td>
</tr>
<tr>
<td><strong>Latch Set</strong></td>
<td>Latch Key Adaption</td>
</tr>
</tbody>
</table>

#### Door Hardware Chart

**CHART SHOWING SIZES OF HINGES**

<table>
<thead>
<tr>
<th>Thickness (in inches)</th>
<th>Door Widths (in inches)</th>
<th>Hinge Heights (in inches)</th>
</tr>
</thead>
<tbody>
<tr>
<td>3 1/2 to 1 1/2</td>
<td>1 1/2 to 1 1/2</td>
<td>2 1/2</td>
</tr>
<tr>
<td>1 1/2 to 1 1/2</td>
<td>1 1/2 to 1 1/2</td>
<td>2 1/2</td>
</tr>
<tr>
<td>1 1/2 to 1 1/2</td>
<td>To 36</td>
<td>3</td>
</tr>
<tr>
<td>1 1/2 to 1 1/2</td>
<td>Over 36 to 40</td>
<td>4</td>
</tr>
<tr>
<td>1 1/2 to 1 1/2</td>
<td>Over 40</td>
<td>5</td>
</tr>
</tbody>
</table>

Illinois Council on Housing
AMERICAN BUILDER
Home owners like the convenience of interior doors equipped with the STANLEY ROLLER CATCH.

Home buyers marvel at the Stanley Roller Catch. It's so simple, so smooth and silent in operation, so convenient. It holds doors securely in closed position (all that's necessary for interior residential doors where a lock is not required) and eliminates rattling.

Not only do you build client good will... you reduce building costs when you equip interior doors with the Stanley No. 23 Roller Catch. It can be installed quickly and, even in small homes, represents a substantial saving.

Catch may be used on closet, wardrobe, and communicating doors... at top or bottom of door, as well as in the conventional latch position. Make the homes you build more convenient to live in — yes, and to buy. Install Stanley No. 23 Roller Catch.

EASY TO INSTALL — Simply bore a 7/8" hole, 2 3/4" deep, at desired location on the door.

EASY TO ADJUST — No tools needed. To adjust for clearance between door and casing, as well as to regulate tension of Catch, simply pull roller-plunger forward and turn with fingers. Each half-turn provides 1/64" adjustment (maximum adjustment 3/8").

The Stanley Works, New Britain, Conn.
Che ability to space economy and more

Sliding and Special Door Fittings

One of the best tec!

Casement locking handle at left above is especially designed for operation with Venetian blinds, will not mark or break blinds when they are being raised or lowered. Casement operating handle at right is gear operated, may be used with inside-mounted screens.

Weather Stripping Materials

Felt weather stripping is economical, easily installed, and will more than repay installation costs in fuel savings. Weather strip of spring bronze is more expensive, but provides a neater installation, and once installed is reasonably permanent.

Many windows have built-in weather strip elements. In at least two such available, the sash balance is controlled by a spring action against the sash, which also performs the weather strip function. The growing demand for more window space in relation to wall areas makes efficient weather stripping more imperative, and of greater influence on sales.

Flash-type latches for cupboards and drawers eliminate projections in narrow spaces

Cabinet, Cupboard, and Kitchen Cabinet Hardware

When ready-made kitchen cabinets are supplied by manufacturers, hardware customarily comes as a part of the unit. Some manufacturers offer a choice, which should be made according to design and quality requirements.

When the builder constructs the kitchen cabinets as custom-built units or purchases unfinished units from the millwork supplier, the hardware must be obtained separately and installed. Because of sales appeal of quality kitchen installations, every effort should be made to use hardware and cabinet specialties that will enhance the builder's work. Labor savers and space-savers such as pot holders, knife racks, etc. will more than repay their slight cost.

Built-in shelving, as in kitchen cabinets, wardrobes, bookcases, and record storage cabinets, is given added flexibility of use by the incorporation of adjustable shelf brackets. The ability to add or remove shelving or vary shelf spacing leads to greater space economy and more efficient use.

Sliding and Special Door Fittings

One of the best techniques for conservation of space in modern homes is the use of sliding doors, especially for closets, wardrobes, and similar applications. Hangers, rollers, track, stops, and guides have been developed and refined to match modern structural materials. Manufacturers have developed hardware for all types of doors; both adjustable and non-adjustable hangers; special tracks for low headroom spaces; concealed guides, and many other features which make installations simple, economical, efficient and attractive.

Special flush-mounted finger pulls, latches and locksets have been created to coordinate with sliding doors giving complete access to all parts of wardrobes and storage units. Bumpers and stops make trouble-free operation. Ball-bearing hangers and fibre rollers make sliding doors smooth and noiseless.

Screens and storm doors may readily be assembled by the builder, using a wide variety of door corner plates, braces and other materials for this work. Special hardware fittings are available providing for interlacing of screens and storm sash in the same door frame. Latches, door closers, barrel bolts, and other accessory hardware is installed to suit customer preferences.

Bathroom, Closet, and Wardrobe Fittings

Bathroom fittings, although usually installed by the plumber, will be selected and in many instances purchased by the builder. Paper holders, towel bars, toothbrush and drinking glass containers, shower curtain rods

Nylon rollers and adjustable hangers make for smooth, trouble-free operation

The popularity of Colonial cabinets is supported by a complete line of hardware of authentic design and appearance. Mechanical construction is of highest quality

The drawer pulls and door latch shown are typical of best present-day styling

(Continued from page 154)

The drawer pulls and door latch shown are typical of best present-day styling

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AMERICAN BUILDER
At McKenna we specialize in only one thing—sliding door hardware. As a result the KENNATRACK line is the most comprehensive and versatile line of sliding door hardware ever available. There is a KENNATRACK for every purpose. Each track is specially designed and engineered for a particular interior use. Each door slides smoothly not on two, not on four, but on EIGHT nylon wheels except on Series 250.

In addition there is a KENNATRACK Series 800 METAL PASSAGE DOOR FRAME. It comes prefabricated and complete with SERIES 400 ball bearing heavy duty track attached to header at the factory. Can be assembled on the job in about 20 minutes.

Features of the KENNATRACK line are too numerous to mention. Moreover, you get all your sliding door hardware from one source. Ask any KENNATRACK jobber about KENNATRACK'S record for fast delivery, prompt service! Specify KENNATRACK for the plus in value.

Write Department 464 for full details.
## HOW TO SIMPLIFY HARDWARE PURCHASING

<table>
<thead>
<tr>
<th>ITEM</th>
<th>QUANTITY</th>
<th>DESCRIPTION</th>
<th>SOURCE</th>
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<tbody>
<tr>
<td>LOCKS</td>
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<td>Tubular, cylindrical</td>
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<tr>
<td></td>
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<td>Night latches</td>
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<tr>
<td></td>
<td></td>
<td>Padlocks</td>
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</tr>
<tr>
<td></td>
<td></td>
<td>Knob and latch sets</td>
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</tr>
<tr>
<td>DOOR FITTINGS</td>
<td></td>
<td>Closers</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Hinges</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td>Knobs, handles, pulls</td>
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<td></td>
<td>Latches and bolts</td>
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<td></td>
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<td>Chains and guards</td>
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<tr>
<td></td>
<td></td>
<td>Push and kick plates</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Weather strip</td>
<td></td>
</tr>
<tr>
<td>WINDOW FITTINGS</td>
<td></td>
<td>Sash pulleys and cord</td>
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<td>Sash balances</td>
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<td></td>
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<td>Operators, adjusters</td>
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<td>Latches, locks, bolts</td>
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<td></td>
<td>Casement fittings</td>
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<tr>
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<td></td>
<td>Weather strip</td>
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<td>Hinges</td>
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<td>Handles, knobs, pulls</td>
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<td></td>
<td></td>
<td>Latches, catches</td>
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<td>Hasps, snaps</td>
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<td></td>
<td>Locks and latches</td>
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<td>Operators</td>
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<td>BATHROOM FITTINGS</td>
<td></td>
<td>Towel rods, hangers</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Paper holders, soap trays</td>
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<tr>
<td>CLOSET, WARDROBE HARDWARE</td>
<td></td>
<td>Latches</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Hinges</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td>Light sliding door hardware</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Hooks, clothes holders</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Rods</td>
<td></td>
</tr>
<tr>
<td>SPECIALTIES &amp; SPECIAL-TO-ORDER TRIM</td>
<td></td>
<td>Decorative trim</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td>Venetian blind hardware</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td>Door chimes and knockers</td>
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<td></td>
<td></td>
<td>Screen hardware</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td>Drapery hardware</td>
<td></td>
</tr>
<tr>
<td>OTHER:</td>
<td></td>
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</tr>
</tbody>
</table>
Operator 4703W, for heavy wood casements, embodies highest quality metals and workmanship. Its internal gearing was originated by, and is an exclusive feature of, The Getty Company. It operates through screens and on casements using butt or extension hinges—as do all Getty operators.

Operator 4715 is an inexpensive angle-drive operator for residential wood casements. It is precision-built, handsome of line, and lubricated for a lifetime of tough duty—as are all Getty operators.

Locking Fastener 4608W is ideally designed for screened wood casements. It locks and unlocks the window without disturbing the screen. Its graceful handle has minimum projection, assuring adequate clearance for Venetian blinds. It's one of a family of high-quality fasteners.

Automatic Closer 4649 pulls top of out-swinging wood sash snugly against the frame. It helps prevent warping, assures all-around tight contact. Easily installed—6 screws; no mortising required.

Extension Hinge 2529 provides a 4” sash clearance for maximum ventilation and permits cleaning of the outside casement from inside the room. Firm corner support of sash is assured by flange-type leaf of cold-rolled steel, cadmium plated.

Operator 4703AF is exactly like 4703W but drilled to accommodate metal casements. Its internal gear construction is designed for heavy-duty service on residential and commercial casements.

Operator 4706H, for metal casements, is the only replacement operator adaptable to nearly all metal casements. The specially drilled holes of this operator permit perfect installation on most metal frames, regardless of the type of operator being replaced.

Locking Handle 4634S is made for metal casements. Its protective action and ample leverage—characteristic of all Getty fasteners—assure perfect snugness and protection against the elements. It's one of more than 50 different metal casement fasteners produced by Getty.

Getty Operators are found on more casement windows than all other operators combined.

H. S. GETTY & Co., Inc.

3348 NORTH 10th STREET

APRIL 1952

PHILADELPHIA 40, PA.
### Sizes of Packaged Aluminum Nails

<table>
<thead>
<tr>
<th>Size &amp; Type of Nail</th>
<th>Price Per Box</th>
<th>Coverage</th>
</tr>
</thead>
<tbody>
<tr>
<td>4d Wood Siding—Casing 2 in.</td>
<td>675</td>
<td>500 bd. ft.</td>
</tr>
<tr>
<td>4d Wood Siding—Casing 2 in.</td>
<td>675</td>
<td>500 bd. ft.</td>
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<tr>
<td>4d Wood Siding—Casing 2 in.</td>
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<td>675</td>
<td>500 bd. ft.</td>
</tr>
<tr>
<td>4d Wood Siding—Casing 2 in.</td>
<td>675</td>
<td>500 bd. ft.</td>
</tr>
<tr>
<td>4d Steel Siding</td>
<td>675</td>
<td>500 bd. ft.</td>
</tr>
<tr>
<td>4d Wood Siding—Casing 2 in.</td>
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<td>500 bd. ft.</td>
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<tr>
<td>4d Wood Siding—Casing 2 in.</td>
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<td>500 bd. ft.</td>
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<tr>
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</tr>
<tr>
<td>4d Wood Siding—Casing 2 in.</td>
<td>675</td>
<td>500 bd. ft.</td>
</tr>
</tbody>
</table>

**Bathroom accessory hardware can add greatly to the beauty of the bathroom.**

Chrome-plated accessories are popular.

Pull-out rods open up for selection of garments and retract for compact storage. Tie racks, shoe racks, skirt and trouser hangers, hat holders and similar accessories keep clothes neat and add to garment life. Closet and wardrobe design may be tailored exactly to the owner's desires, and limited only by the customer's purse.

**Garage Door Hardware and Fittings**

Garage doors may be simply hinged, or of the rolling type, or of overhead construction. Hinged doors are the most economical to install; sturdy hinges and latches should be used.

Rolling and sliding garage doors offer several advantages over folding doors. Hangers, track sections, latches and locks permit long-lived installations free from maintenance problems. Special track sections resist rain and ice. Hangers adjust for possible sagging of doors or settling of foundations. Stops, guides, and track hangers permit installation in any type of material, inside or outside. Lock mechanisms provide full security, and guide rollers insure smooth operation.

The overhead type of garage door, because of its economy of space, has become increasingly popular. Hardware design has made possible the use of this type of door. Spring counterbalances minimize effort, so that doors are raised or lowered at the touch of a finger. Track and roller units eliminate jamming and binding. Garages for high-cost homes may have motor-operated garage doors, and garage door control by photo-electric eye or radio-actuated mechanisms has been brought within the range of commercial installation.

**Specialties and Special Order Trim**

Hardware specialties include such items as door chimes, venetian blind hardware, curtain hardware and drapery fittings.

Picture windows dictate the use of drapery traverse hangers, which may best be installed by the builder. Consultation with the lady of the house will direct the style of hanger, finish, etc. In similar fashion, tie-backs for curtains, venetian blinds and accessories, door chimes, and other hardware extras can mean added profits and good will.

**Nails, Screws, Fastening Devices**

The array of builders' hardware items—screws, nails, anchors, bolts, nuts, and so on—is almost endless and is so well known that it needs little mention here.

The use of aluminum nails in exposed woodwork to eliminate rust streaking is fast becoming standard practice in siding installation. The relatively slight additional cost is negligible compared to the improved appearance and the value of these nails as a sales point. Other special-application nails are drive screws and clinch nails for shingles and wallboard, and special nails for acoustical tile which eliminate damaging of the tile face.

Again, there is a vast variety of form clamps, form ties, and other form hardware. The builder uses form ties that his workmen are accustomed to and that he has found efficient. Such devices are constantly being improved and new types offered, and the alert contractor will keep abreast of all such developments.

Bolts and nuts, washers and screws—these are all pretty much standard. But the manufacturers are giving new twists to old materials—improved

(Continued on page 158)
SHURLOK GLASS KNOB BEDROOM OR BATHROOM SET... a "smart looking" member of the new Shurlok line featuring sparkling beauty, lifetime quality, economy and sensational new style construction.

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<th>$12.50</th>
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<td>School Planning Data Book</td>
<td>8.00</td>
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<tr>
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<td>10.00</td>
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<td>The Last Lath</td>
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<td>Planning and Building the Modern Church</td>
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<td>6.50</td>
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<td>8.50</td>
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Rockford, Illinois

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Rockford, Illinois - Merchant Sales Division

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### Nail Requirements per 1000 Feet of Building Materials

<table>
<thead>
<tr>
<th>Size and kind of Material</th>
<th>Board area or ft.</th>
<th>Trade name</th>
<th>Lbs. of Nails Required</th>
<th>Length of nail</th>
<th>No. of nails in ea. heading</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 x 4 Boards and Shiplap</td>
<td>1000</td>
<td>8° common</td>
<td>60</td>
<td>21°</td>
<td>2</td>
</tr>
<tr>
<td>1 x 6 Boards and Shiplap</td>
<td>1000</td>
<td>8° common</td>
<td>80</td>
<td>21°</td>
<td>2</td>
</tr>
<tr>
<td>1 x 8 Boards and Shiplap</td>
<td>1000</td>
<td>8° common</td>
<td>57</td>
<td>21°</td>
<td>2</td>
</tr>
<tr>
<td>1 x 10 Boards and Shiplap</td>
<td>1000</td>
<td>8° common</td>
<td>35</td>
<td>21°</td>
<td>2</td>
</tr>
<tr>
<td>1 x 12 Boards and Shiplap</td>
<td>1000</td>
<td>8° common</td>
<td>20</td>
<td>21°</td>
<td>2</td>
</tr>
<tr>
<td>1 x 14 Boards and Shiplap</td>
<td>1000</td>
<td>8° common</td>
<td>15</td>
<td>21°</td>
<td>2</td>
</tr>
<tr>
<td>1 x 16 Boards and Shiplap</td>
<td>1000</td>
<td>8° common</td>
<td>10</td>
<td>21°</td>
<td>2</td>
</tr>
<tr>
<td>1 x 18 Boards and Shiplap</td>
<td>1000</td>
<td>8° common</td>
<td>8</td>
<td>21°</td>
<td>2</td>
</tr>
<tr>
<td>1 x 20 Boards and Shiplap</td>
<td>1000</td>
<td>8° common</td>
<td>6</td>
<td>21°</td>
<td>2</td>
</tr>
</tbody>
</table>

(Continued from page 162)

thread designs, lock washers and clamp nuts, screw heads which are more efficient with power screw drivers, etc. These are all little things but in a year can add up to many dollars saved through selection of the latest and best.

Both drywall construction and metal lath with plaster in hollow-wall construction have brought forth a wide array of special fastening devices, clips to hold the lath or panels in place, channels to contain top and bottom of panels, spring-type slips to provide the basis for resilient hollow-wall panel construction. Techniques for application vary from the simple hammer and pounding-block to fastening some types to the underside of the panels with mastic or cement paste developed for the purpose.

### Time Savers
In addition to the rapid advance in both builders' and finish hardware, manufacturers have also developed numerous small tools, jigs, and fixtures designed to speed the application and installation of their particular hardware items.

Lock manufacturers have brought out precision-engineered jigs which clamp on quickly to door and frame and assure perfect right-angle holes for proper lock fit. Boring kits and mortising tools are also available from lock manufacturers.

Many of the manufacturers of special builders' hardware items such as special clips and fasteners for the attachment of wallboard have also developed special tools for the application and installation of their products. Such instances are numerous. Asbestos siding shingles for instance, would be expensive to apply were it not for properly designed, efficient cutters for this material. Corner tubing installers have been made cheaper and better because the tubing manufacturer has also developed the tools for cutting, flaring, and attaching the tubing to fittings. The thin wall electrical conduit system would be impractical and expensive were it not for the special connectors, fasteners, and bending and fastening tools provided for working with this material.

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AMERICAN BUILDER
INDOOR CUTTING SHOP OF CONTRACTOR. Workman at left uses power plane; at right, door is mortised for lock; third workman rabbets for butts with router. Power tools speed work and cut costs.

IT IS impossible to think of the building industry without considering the great variety of tools necessary to building work. From the stone hammers and flint axes of primitive peoples have developed the hundreds of tools now in everyday use.

PURPOSE AND DESIGN OF TOOLS

The primary purpose of any tool is to extend the ability of the worker, to let him work more efficiently, or to do work that would otherwise be difficult or impossible. A rock may be used to hammer nails, but a hammer is more efficient, and a power nail-driving machine extends the ability of the worker many-fold. A worker could possibly bore holes with a crude piece of metal sharpened at one end, but a carpenter's bit and brace make this a matter of minutes (or a power drill, seconds), with a precision otherwise impossible.

Modern low-cost building methods would be impossible without today's tools. Sawing, digging, drilling, pipe threading, and countless other operations are accomplished with production tools at a fraction of the cost of obsolete methods. The tool which finds acceptance is the one that does the job more easily. Tools which take the least muscular effort, are most convenient in operation, and require the least adjustment in use are always preferred.

Safety is one of the most important factors in tool design. Saw guards, ground wires and efficient insulation for electrical tools, the use of quality steels to prevent chipping of hammers, drills, and chisels—these are typical of the added safety built into tools today.

Constant improvements in tool design improve the quality of the work. Power woodworking tools make every carpenter the equal of yester-
day's most skilled and painstaking craftsmen. Abrasive wheels for cutting brick and tile let the mason do neater, stronger work. Power threading machines for the plumber and steamfitter give more uniform threads and make them less likely to leak. Cement vibrating and finishing machines help to produce a denser, harder surfaced concrete.

"The right tool for the job" is an axiom so old that it hardly needs repeating. No one would use a sledge to drive finishing nails, or a keyhole saw to cut a 6 by 6 timber. Tools are now tailored to fit the particular job. Only by getting the tools best suited for the work can the greatest economy and efficiency be realized.

As important as the selection of the correct tool is the proper maintenance after it is put in use. Power equipment should be lubricated at the intervals recommended by the manufacturer; saws and all other cutting tools should be kept sharp; adjustments for wear, as of pipe dies, should be made as soon as necessary; and dirt, abrasive materials, or other materials which would cause excessive wear should be removed from tools promptly to avoid future trouble.

**HAND TOOLS**

The basic hand tools in daily use in the construction industry are, in form, much the same as for the past three or four centuries. The carpenter uses the saw, hammer, try-square, level, anger and brace and bit. The mason uses the trowel, line, brick hammer and chisels, and level. The laborer's basic tools are the shovel, pick, and sledge. The plumber depends on wrenches, cutter, reamer, stock and dies. The electrician uses pliers, soldering iron, and so on. All of the basic hand tools are so much a part of the work that little thought is actually given to their design, or to the slight but important improvements that have been made throughout the past few years. New steels have improved the quality of saws and chisels; aluminum levels are less likely to break, and are easier to handle than those of wood; plastic handles for tools wear and feel better than wood ones; and in many other little ways hand tools are better today than in the past. In general, it pays to get the best-quality tools. The higher first cost is soon offset by the added life, better work, and ease of use of quality tools.

The contractor must have an adequate supply of tools for the greatest number of men he will have working at any one time. If there are six laborers on the job but only five shovels, one man will stand idle. But it is not sufficient to have just enough; even with the best of care, tools will break or become worn in use, so it is necessary to have reserve tools on hand to take care of breakdown, or waiting periods, as when one saw blade is being sharpened.

Keeping track of tools can cut to a minimum the losses from pilferage and carelessness that are inevitable. The good worker will not walk away and leave his tools lying about, to be picked up by others or just carelessly lost. A system of tool checks for tools taken out of the shanty, the branding or stamping of tools with the company name or initials, and the safe locking up of tools at night, and when not in use, can all help to reduce tool losses.

**HAND POWER TOOLS**

The list of power tools for hand use on construction work grows almost daily, as manufacturers develop new designs. The following are among the more common:

**Drills**

Electric hand drills are made in perhaps a greater variety than any other hand power tool; one manufacturer lists 27 different types of ¾-inch drills alone. Sizes of electric drills are from light ¾-inch up to heavy 1-inch drills (for steel), pistol grip, spade handle, and other styles permit selection of type to job. Speeds are variable in different models, from around 2000 rpm for small drills down to 200 to 300 rpm for larger sizes. Key type checks are almost universally used, as their greater gripping power offsets their slight additional cost as compared to hand checks. Choice of a drill is first on size of work to be handled; second, the type of work will dictate the
Mr. H. B. Sanson says, "Hand cutting the stringers for this circular stairway could have been a slow and tricky task. But with a Stanley Router and a handmade template we made precision cuts quickly and easily—at a big saving of time and 'muscle'."

"Wherever possible we use Stanley Routers...and the more we use them the more we save. They're important members of our building crew."

And it's for these same reasons—time and money saving—that more and more profit-minded contractors use Stanley Routers for all kinds of smooth, finished cuts. Use them on "specials" like this circular stairway and to put speed and precision into everyday jobs—mortising for hinges, edging stair treads, doors, panels, dovetailing, shaping, beading and fluting, and many other types of work limited only by the user's ingenuity.

See these cost-cutting Stanley Routers in action at your dealer's or write for descriptive literature to: Stanley Electric Tools, 400 Myrtle Street, New Britain, Connecticut."
## Tool Maintenance Is Profitable

### How Good is Yours ...

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<thead>
<tr>
<th>Question</th>
<th>Yes</th>
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<tbody>
<tr>
<td>1. Do you have and use a regular, systematic schedule for inspection of all tools, both in the shop and on the job?</td>
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<td>2. Do you have a regular schedule for the lubrication of all power tools and moving machinery?</td>
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<td>3. Do you have a systematic routine for cleaning tools, both at the end of the day's work, and upon completion of the job?</td>
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<td>5. Are tools having variable speeds always operated at the correct speed for the work being performed?</td>
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<td>6. Do you have a regular procedure for instructing each worker in the proper use, purpose, and care of the tools he uses?</td>
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<td>7. Do you impress each workman with the importance of keeping his tools in proper condition?</td>
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<td>8. Are you certain that each tool and machine is used only for work it is designed to handle?</td>
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<td>10. Do you have the instruction books, service manuals, and other information provided by the manufacturer on hand, and available to foremen and workmen?</td>
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<td>11. Do you have a clear-cut system for ordering repair parts, checking to see that they are delivered, and installed in the tools needing them?</td>
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<td>12. Do you have a manufacturer's representative or service man call regularly, at least once a year, to check tools for wear and proper maintenance?</td>
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<td>13. Are all the workmen instructed to report promptly any defects in operation of the tools they use?</td>
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<td>14. Are tools not in use on the job stored securely in the shop, properly protected against corrosion, moisture, fire, and theft?</td>
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<td>15. Are tools moved promptly from one job to another, so that tools needed at one job are not sitting idle, and does each job have the tools best suited for its needs?</td>
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FOR SMOOTH FLOW OF POWER, HIGH QUALITY HELICAL GEARING IS USED TO DRIVE BLADE.

POWERFUL UNIVERSAL MOTOR BUILT BY BLACK & DECKER SPECIFICALLY FOR TOUGH POWER SAWING.

MAKING MAXIMUM USE OF POWER, SPECIALLY DESIGNED 8 & D BLADES CUT MOST EVERY BUILDING MATERIAL KNOWN IN A JIFFY.

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PORTABLE ELECTRIC TOOLS

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Talk about ABUNDANT POWER
Look what Black & Decker Saws give you!

PLUS
- Easy Handling
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- Gatesman Safety
- Job Versatility

PLUS
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- 6' Heavy-Duty...$96.50
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See Your Building Supply Dealer
for a convincing demonstration of
Black & Decker Saws and Blades and
handy, new Protractor. Learn how they
pay for themselves in a few jobs! WRITE
FOR FREE CATALOG.

APRIL 1952
POWER DRILLS are available in a variety of sizes and types. Right, is shown low speed, lightweight drill geared down to 450 r.p.m. for drilling steel, glass, brick and other hard materials. Left is a drill-hammer for masonry. The bit both hits and rotates at the same time, and has 1/8 to 3/8-inch drill capacity.

TYPICAL HAND DRILL having almost universal application on the job.

POWER DRILLS are available in a variety of sizes and types. Right, is shown low speed, lightweight drill geared down to 450 r.p.m. for drilling steel, glass, brick and other hard materials. Left is a drill-hammer for masonry. The bit both hits and rotates at the same time, and has 1/8 to 3/8-inch drill capacity.

(Continued from page 173)

speed of operating; third, the question of intermittent or continuous use may be a factor in the cost. Drill bits must be matched to the work. Drill points for metal are not suited for continuous wood drilling. Different drills may be had for wood, steel, alloys, glass, marble, concrete, and ceramic tile. Drills must be properly sharpened, and it will usually be found that this is better done by one man skilled in this operation, rather than letting each worker sharpen his own.

Saws

The light, easily handled electric hand saw is one of the most common on-the-job power tools today, and it is doubtful if any other power tool has resulted in a greater saving in time and cost in construction work. From the setting of forms to final trim, carpenters are working better and faster with powered hand saws. Most common sizes are those using 6-inch and 8-inch blades, handling 1-inch stock and 2 by 4's with ease, although hand saws taking blades up to 12-inch diameter can be had for larger timbers. Built-in guards cover the blade at all times except where the saw is actually cutting, and "dead man's" switches prevent operation of the motor unless positive pressure is applied to the switch, so that the saw cannot be left running unattended.

Some models have a tilting shoe for cutting bevels, and others have provision for attachments converting the hand saw to bench use, or for work as a radial saw.

A variety of blades are available: combination blades for general use, both cross-cutting and ripping; carbide-tipped blades for heavy duty use, and where nails may be encountered; abrasive wheels for cutting of brick, tile, light metals, and dado heads.

Sander

Three basic types of sanding machines are in common use. Belt sanders, having a continuous belt of abrasive material passing over two rollers, and drum sanders, in which a band of abrasive is attached to a revolving drum, are suitable for production work on relatively large areas. Disc sanders, in which a disc of abrasive material is attached to a rotating rubber pad, enable the worker to get up to the edges of walls, and to operate in other "tight" places. Reciprocating or oscillating sanders, in which a flat sheet of abrasive moves backward and forward, or in an oscillating movement, are convenient for small areas, for smoothing dry wall seams and other similar work. Any sander selected should have adequate power for the work, should use standard size belts, sleeves, discs, or sheets; should have adequate protection of the motor bearings and moving parts against the entry of dust and abrasive grit. Manufacturers' recommendations should be followed as to the type of abrasive which should be used for different surfaces. Many different grit sizes, bonds, and cutting materials make the power sawer most versatile for all finishing operations.

Grinders

Hand grinders may be of the self-contained variety, or may operate from a flexible shaft. For preparing work for welding, dressing down exposed welded joints, smoothing exposed concrete surfaces, finishing stonecutting operations, the hand grinder is invaluable. When fitted with the proper wheel, a flexible shaft grinder can be clamped in a vise to pinch hit for a bench grinder in sharpening tools.

(Continued on page 189)
Now your circular saw dollar buys faster, cleaner cutting and longer useful life than you ever thought possible in these days of rising prices. The new Disston line is priced to make it the leader in value...designed to make it the leader in performance!

New efficiency in combination sawing: The new Disston style W Combination Saw sets a new standard of cutting efficiency. It is of a radically different design, based on advanced principles...the result of fundamental research by Disston engineers aimed at meeting the demand of portable electric hand saw industry for a combination blade that would cut faster and cleaner...stay sharp longer...yet put less strain on small motors.

Disston Circular Saws are made in all tooth types—cut-off, planer, flooring and combination—with center holes to fit all popular makes of portable electric hand saws. Each is individually packaged and has etched plainly on it the name and model number of the machine it fits. You can be sure you have the right blade for your saw when you buy a Disston!

ASK FOR DISSTON SMALL CIRCULAR SAWS AT YOUR CONTRACTOR SUPPLY OR INDUSTRIAL SUPPLY HOUSE

HENRY DISSTON & SONS, INC.
422 Tacony, Philadelphia 35, Pa., U.S.A.
Canadian Factory: 2-20 Fraser Avenue, Toronto 3, Ont.
New Production Line Economies

RADIAL SAW This new 16" Delta Radial Saw cuts through the entire 360° at every conceivable angle. All cuts are made above the work table, in clear view. For miter capacity and extraordinary versatility, this saw truly has no equal. Also available on 8", 10", 12" and 14" models.

CIRCULAR SAW Mass production ripping is exceedingly simple on this massive, rugged, big-capacity Delta 12" tilting arbor saw. Its accuracy is built-in for long years of usefulness. For dependable performance and operating economy, there's nothing finer. Also available in 10" and 8" models.

JOINTER The long work table on the Delta 8" Jointer makes it an ideal tool for easy handling of long boards. The special 4-knife cutterhead is 33% per cent faster than a 3-knife machine. Making true "finish" cuts fast eliminates extra operations. Also available in 6" model.

BAND SAW Ideal for all curve cutting and taper work, the Delta 20" band saw is exceedingly fast, safe to use and most economical to operate. It will cut one piece at a time or many stacked pieces—with perfect accuracy. Also available in 14" and 36" models.

PLANER For converting rough lumber at high speed, the Delta 13" x 5" planer is an important money-saver. Rugged, safe, amply powered, it does a precision job on any stock from 13" x 5" boards to 6" pieces unbutted. No kick-back. Also available in 24" x 8" model.
and Profits Can Be Yours—with

DELTA "BIG 5" Machines

Precutting framing, doing your own millwork, building cabinets, streamlining lumber handling in Delta-tooled shops are definitely reducing building costs today!

More and more alert builders are finding in Delta's "Big 5" Machines a dependable means to cutting costs and increasing profits. The built-in precision accuracy of these fine tools, their durability and remarkable low-maintenance records, their superior safety features—all these make the "Big 5" ideal equipment for a central shop or on-the-site installation.

Here's How You Can Save Money USING THE DELTA "BIG 5"

- Straight-line, low-cost handling of lumber.
- Precut lumber into ready-to-use shapes for high speed construction.
- Re-work material for special uses—salvaging scrap, eliminating waste.
- Modernize job operations; Delta tools pay for themselves quickly, reduce your tool investment.
- Do more operations with fewer machines—Delta accessories are a big help.
- Save valuable space because of Delta's compact designs.
- Cut operating costs to a minimum—Delta machines are economical to run.
- Handle more work in less time—means you can build more houses at bigger profit.

All these cash advantages can be yours—and the way to find out "how" is to talk with your Delta dealer. He's thoroughly familiar with your production problems. Also send for the full specifications and descriptions of the "Big 5." Use the coupon.

Only in Delta Tools can you get these EXTRA QUALITY FEATURES AT NO EXTRA COST

- 4-belt drive on 12" tilting arbor saw provides constant, even power-flow—no loss through slippage
- Double worm-gear reduction drive on Delta 13" x 5" planer automatically lubricated—means years of trouble-free service
- Delta finger-tip controls in instant reach—safety switches reduce accidents
- Delta's tables are massive, heavily ribbed, precision ground—accurate!
- Delta's handy up-front controls make operation easy
- Light-weight Delta tools are tops for mobility
- All Delta's pulleys are dynamically balanced—less vibration and bearing strain mean longer life.
- Special pre-loaded, sealed and lubricated-for-life ball bearings assure continuous accuracy
- Delta's motors are rugged, powerful, to NEMA standards, backed by nationwide service
- Delta tools have safety guards that protect!

There's a Delta Power Tool for Your Job—WOOD OR METAL WORKING

53 MACHINES • 246 MODELS • MORE THAN 1300 ACCESSORIES

For Delta Dealers, see your Classified Phone Directory under "Tools".

APRIL 1952
HEAVY DUTY FLOOR SANDERS using a revolving drum to which sandpaper is fastened. Finishing or refinishing may be done cheaply with modern sanders

(Continued from page 176)

The selection of the correct wheel for grinding operations is often neglected; workers will use any wheel in the grinder, rather than change to the correct wheel. Foremen should see that a wheel for rough dressing of concrete is not used to sharpen tools, for example.

Grinders are more susceptible than any other tool to damage from dust and grit. Selection of tools which are adequately protected, and regular cleaning and lubrication are "musts" with grinding equipment.

Planes

Power-driven planes have been welcomed by builders for trim and finish carpentry work. They make the hanging of doors and windows, fitting of cabinets and trim woodwork a fast and easy job. The power plane is essentially a hand-held jointer. A revolving cutter head with three knives is fixed in relation to a base plate which may be adjusted to control the depth of cut. Also, an adjustable guide may be set to make accurate bevel cuts.

The power plane will usually be handled only by the one or two men doing the trim work, and they should be responsible for its care and maintenance. Blades should be sharpened immediately upon signs of dulling, and extra blades should be kept on hand if sharpening is not done on the job.

Hammers

All of the building trades find the power hammer a great saver of time and money. For breaking out concrete, drilling holes for inserts, notching heavy timbers, setting expansion plugs, hammers do in minutes work that would otherwise take hours. Lightweight, small units permit work in spaces too small to allow a chisel and sledge.

The severe vibration of the electric hammer makes the most rugged construction necessary for these tools. Shock-absorbing drive linkages added to the design have lengthened tool life greatly over the earliest units. Quality should not be sacrificed in the purchase of these tools.

Many different tool bits for electric hammers permit the most efficient use for each job. Carbide-tipped drills for holes, special steel chisels for wood and bull points for breaking concrete, all speed up the job and make possible top efficiency.

Routers

The portable hand router, like the hand planer, lets the trim carpenter do faster, more accurate work. Routers

LOCK MORTISER speeds job of installing and eliminates possibility of damaged doors

POWER HAMMER ABOVE OPERATES BY AIR PRESSURE of 30 to 100 pounds, and has no kick when held against the work

ABOVE A PORTABLE NAILING HAMMER that rapidly drives 16-gauge 1/2-inch staples into soft or hard wood with one blow of the fist or a rubber mallet. Easy loading, positive feed and drive assure rapid operation

(Continued on page 185)
CUT YOUR BUILDING COSTS

with

Milwaukee Portable Electric Tools

Famous for "MORE MOTOR GUTS"

Mitering Power Saws ➔

6½" and 8½" blades

Deeper Vertical and Bevel cuts than other saws of the same diameter.

6½" model miters 2" dressed lumber at 45°.

3-Speed, ½", 9 lb. wt.

Hole-Shooter

for BOTH straight and right-angle drilling.

Bores up to 3-inch diameter in wood.

Write for complete information...Folder SD-11.

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Canadian Distributor: MATTHEW MOODY & SONS CO. • 740 Inspector Street, Montreal

APRIL 1952
Radial Arm Saw Techniques

NOTCHED RAFTERS

The most efficient manner in which to cut the rafter shown in Fig. 5 would be to have two radial arm saw machines in line—one with a saw blade on the arbor and the other with a rafter notching head. The arm of the first machine would be set at the angle required to make the vertical cuts. The second machine would be set so rafter notching head would be at the angle of the notch, or bird mouth. The vertical angle of the bird mouth is the same as the vertical cut. If the angle is 22 degrees 37 minutes (5/12 pitch), the motor would be beveled 22 degrees 37 minutes from the vertical.

Material is laid flat on the table and moved to the first machine where the first vertical cut is made. Then material is moved to a swinging stop for the second vertical cut. Material is turned on edge and moved to second machine where the notch is cut. An example of this cut is shown in Fig. 7 below.

If only one machine is used the best method to follow would be to make all the vertical cuts and then stack the material. Change the blade for a rafter notching head and cut the required notches.

To make cuts shown in Fig. 6, above three machines should be in line—one equipped with saw blades and one with a rafter notching head. This arrangement produces best results. The first machine should be set up to make vertical cuts, the second to make horizontal cuts, and the third machine to make the notch or bird mouth.

If only one machine is used, vertical cuts are made first and the material stacked. The arm of machine is then swung through to the angle of the horizontal cuts and these are made. The blade is taken off the machine and replaced with a rafter notching head to make the notch.

With one machine, and using only a saw blade, the vertical cuts are made first, and then the horizontal cuts. With the material on edge, the plate cut of the notch is made. The fourth time through, the vertical cut of the notch is made.

With two machines available to make the cuts shown in Fig. 6, above, it is suggested that the horizontal and vertical cuts be made first. Then, using the method that applies to the equipment available, cut the notches.

MITER CUTS

The miter cut shown in Fig. 8 is made with the arm of the machine turned to the angle of the cut. With the arm turned, two pieces of material flat, one on top of the other, can be cut at the same time.

If material is placed on edge the arm is left in normal position and the saw blade is set at a bevel, shown in Fig. 9. As many as eight rafters can be mitered at one time in this manner.

To make the compound miter bevel the saw is set at 45 degrees. Swing the arm to the angle of the plumb cut, and with the material laid flat, make the cut. This method is shown in Fig. 10.

The stop shown in Fig. 11 is the recommended type for miter cutting. It will prevent material from resting on the point or sharp edge while the cut is made.

Time and labor can be saved if cuts are laid off to make the jacks into pairs at each cut. This is done by starting with the short right hand jack and the long left hand jack.

ROOFING TABLES

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You can build better and faster... save labor and reduce costs... with these high-production American Machines and Portable Tools on the job! More and more builders today have found that American is the answer—to speed up small tool jobs of sawing, planing, sanding...and put a beautiful surface on floors with rapid and efficient sanding, steel wooling and polishing! American builds 'em right—machines of advanced design, precision construction and rugged dependability. For a finish you'll be proud of on any floor—specify American...a complete line of quality finishes, maintenance and cleaning materials for wood, cork, concrete, terrazzo, asphalt, rubber, linoleum or plastic. Send coupon for more details.

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AMERICAN
FLOOR MACHINES • PORTABLE TOOLS

APRIL 1952
Where can you cut
your fastening costs?

See how this leading manufacturer of house trailers
cut costs up to 30% on four different operations

1. FASTENING LAMINATED PLYWOOD BOWS of trailer frames with
Bostitch staples holds them firmly in place while glue sets. Bostitch H4 self
feeding hammers, used on this job with rubber mallets, do the work 3 times
faster and 30% lower in cost than hand nailing. It's easy to see why. One
hammer per staple. No slow placing of nails. No misses. Less worker fatigue.
You, too, may find that Bostitch stapling hammers or machines can cut your
costs of fastening wood, light metal, paper, leather, rubber or plastics.

2. ASSEMBLING SCREEN DOORS with Bostitch T5 stapling
tackers is twice as fast as hand
nailing, reports this same trailer manufacturer. The reason is clear.
One-hand, finger-squeeze operation is quick, easy and accurate ...
leaves other hand free for
holding the work.

3. APPLYING INSULATION to trailer walls is done better
and faster with Bostitch T5 tackers. Builders enjoy the same benefits.

4. ATTACHING GIMP to the
trailer frames is also easy with
Bostitch T5 tackers. Staples can
be accurately placed within
1/16" of edges.

Get more cost-cutting facts ... Mail this coupon today!

BOSTITCH, 588 Mechanic Street, Westerly, Rhode Island

Please rush me free literature showing which Bostitch stapling
machines selected from your more than 800 models can help me
do better, faster fastening. The materials I fasten most are:
Wood □ Paper □ Rubber □ Plastic □ Fabrics □
Leather □ Light Metals □

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300 Bostitch Field men in 112 cities in the United States and 11
cities in Canada offer you nearby service.

BOSTITCH®
AND FASTER
fastens it better, with wire

Power Tools Make
"Extras" Possible

An unusual amount of "extras" are incorporated in the
new low-cost homes being built by the B-D Development
Co. of Birmingham, Ala. R. H. Brown, president of
the building concern, says that his latest 51-unit housing proj-
et will feature houses with a large number of "extras" and
that this is being made possible by the savings realized
through the use of modern power tools and equipment
used by workers at the construction site.

Among the "extras" made possible by the savings
through use of power equipment and incorporated into the
homes are: Youngstown cabinet, sink and garbage dispos-al
unit; Gerity-Michigan dishwasher; Bendix automatic
washing machine; Westcoo electric clock; Interna-
tional Harvester refrigerator; Hardwick gas range;
Westinghouse exhaust fan and motor; Walker built-in
ingoing board; in addition, there is a chest of drawers in
each bedroom, built into the closet with mirror above, and
a book shelf built into the wall of the large bedroom.

Preliminary advertising brought 150 applicants for the
51 homes of the project.

Time is saved by use of this radial saw with 2 H.P. motor

Power equipment which resulted in the substantial sav-
ings included DeWalt 2 H.P. radial saw; Boice-Crane
jointer and planer; Whiteman concrete finishing machine;
Dayton grinder and sharpener; Dayton arc-welding unit;
Black & Decker standard drill; Stanley router; Skilsaw
3-inch belt sander; Stanley electric planer; Bostitch staple
hammers; Master Vibrator backfill tamper; Skilsaw port-
able power saws; Boice-Crane table saw; Heston &
Anderson jointer.

The houses are two-bedroom units that were designed to
sell for an average price of from $7,850 to $8,200, lot in-
cluded. At the construction site a woodworking shop is set
up and equipped with modern labor-saving power tools by
means of which all framing members, including trusses,
which are set 24 inches on center are cut, and entire
wall panels are fabricated.

Excavation for foundation wall is a 12-inch trench into
which is fitted a "tailor-made" steel form which allows
for concrete pouring of footing and outside perimeter of
concrete slab in one operation. Insulation material one-
half-inch-thick and 4 inches wide is placed around floor
joints and Sisalkraft material is placed on the floor over
steel reinforcing mesh covering concrete slab base. This
base is laid on a slag fill, 4 inches deep.
STAPLING HAMMERS have a wide variety of uses on all building jobs. They are manufactured in a number of sizes and types adaptable to many operations, particularly the application of blanket and batt insulation.

WORKMAN USING A POWER SCREW-DRIVER to fasten hinge butts in previously routed mortises. Power tools cut costs in finishing operations.

(Continued from page 180)

Spray Guns

Although painters are the principal users of spray equipment, other construction men also benefit from these tools. Spray units may be used for application of waterproofing compounds, sealers, form lubricants, and even insecticides.

Spray guns are made in a wide range of sizes and styles according to the volume of the work and type of material handled. For light liquids, atomizer-type guns are more economical and of lighter weight, while a pressure feed gun must be used for liquids of greater viscosity. The pressure feed gun is particularly suited to the spraying of heavy liquids, such as asphalt emulsions.

(Continued on page 188)

A TYPICAL SHINGLE CUTTER which handles asbestos siding and shingles. Two sizes available: 27 and 32-inch blades.

One sure way to cut costs and increase profits is to use this portable Atlas 10" saw for all interior finishing and built-in cabinet work. The Atlas makes 1 minute as good as 10 compared to hand sawing.

It's big enough to handle large boards and panels quickly, easily — there's 24.5" table surface between fence and blade — 123/4" in front of blade. Full size of table and extensions is 45 1/2" x 25". No other saw of comparable price provides such work area capacity.

The exclusive patented Atlas fence is a great time saver — takes less than 5 seconds to change from rip to cross cutting. It lifts off or on instantly ... slides to position (has Vernier control for fine adjustment) ... extends clear across table ... locks rigidly at both ends, or unlocks, with quick lever control.

See all the features of this on-the-job table saw. Write for latest illustrated catalog.

ATLAS PRESS COMPANY
439 No. Pitcher Street, Kalamazoo, Michigan
Kick-Proof Saw

PORTER-CABLE

At Your Dealer's
Lowest Masonry Cutting Costs
with EVEREADY BRIKSAW
and EVEREADY BLADES

Now STOCKED LOCALLY
Pick Up Blades As Needed

Cut ANY MATERIAL IN 4 to 21 SECONDS
SAVE MONEY SAVE TIME

The fastest, most modern Masonry Saw on the market today! Cuts any Masonry material, or Stone—WET or DRY.

EVEREADY Abrasive and Diamond Blades
Fit every make and model of Masonry Saw. An exactly right EVEREADY Blade for every cutting operation.

Exclusive EVEREADY FEATURES

A POWER SPRAY UNIT, fed from a pressure tank, is used in the shop for spraying doors, cabinets, and bookshelves. Note exhaust fan for worker protection against fumes.

(Continued from page 185)

SURE FEED GUID is to be preferred for most construction work. Light spray equipment, which can be carried from one part of the job to another, may get its air supply either from a motor-driven compressor of the piston-displacement type, or from a diaphragm pump. The diaphragm pump is cheaper and lighter, but will require replacement of the rubber diaphragm at intervals; a piston pump, is heavier to carry and more expensive initially.

The heart of the spray gun is the nozzle in which air and paint are mixed to form the spray. Nozzles may be adjustable as to the size and shape of spray delivered, and as to the amount of paint and air combined. Gun and tips should be chosen for the material to be used, and cleaned after each day's work.

A tool which may be mentioned with spray units is the pressure-fed paint roller especially developed for the application of casein and rubber-base paints. Paint is contained in a pressurized tank and fed through a hose to a paint roller of porous material, permitting fast coverage of walls without the fumes and dust problem of spray paint.

EVEREADY BRIKSAW COMPANY
1505 S. Michigan Blvd., Chicago 5, Ill.
Send without obligation of any kind FREE Booklet on "HOW TO CUT BLADE COSTS IN MASONRY CUTTING"
NAME
ADDRESS
CITY STATE

FOR QUICKER AND BETTER WORK

IMPROVED PEARSON CUTTERS

SMALL JIG SAWS shown weighs only 18 pounds, yet will handle 1-inch lumber. and will do many scroll, trim, and cornice jobs

DUO-FAST

STAPLE GUNS FOR TACKING INSULATION—CEILING TILE BUILDING PAPER SCREEN WIRE
Profit by this fast, easy, efficient tacking method. Does the job three to five times quicker. Hold material in place with one hand—operate tacker with other. Speed up and simplify your next job with Duo-Fast.

For Heavy Duty Work Use This Hammer Tacker

Service You will be pleased with the free service extended all Duo-Fast users. Write or phone:

FASTENER CORP.
888 North Street, Chicago 14, Ill.

ASBESTOS BOARD AND SHINGLE CUTTER
An ideal tool for asbestos applicators, contractors, and lumber dealers. Cuts 1/4" thick 4' x 8' cement asbestos sheets as well as asbestos roof and siding shingles. It's fast, accurate, A TIME SAVER. Cutter is of heavy plate tempered against war. Asbestos sheets may be cut standing on edge against wall, or on floor. Shingles can be marked by each edge as usual and cut across, the one mark guiding the cut straight. Weighs 4½ lbs.—24" long. Low price of $8.25

O. PEARSON MFG. CO.
P. O. Box 255, Lake Villa, Ill. Phone 6-2334
BAND SAW above has a built-in guard. Only required sawing portion of the blade is exposed. Table adjustments are provided, and anti-friction guides reduce saw blade steel crystallization.

WHAT ARE THE MOST IMPORTANT THINGS ABOUT SAWS?

A "COMPLETE WORKSHOP"

...Cuts, Miter, Planes, Rabbets, Grooves! Only Boice-Crane Make a

Tilting Arbor Saw-Jointer

10" tilting-arbor saw and a 6" jointer driven by one, rather than two motors. Both machines can be used simultaneously, and have exclusive features providing more capacity for their size.

This CHAIN SAW is used for felling trees, and for sawing large timbers.

STUD DRIVERS

An ingenious tool making use of a powder charge to drive hardened steel studs in concrete, masonry or steel permits the setting of door knobs and window frames in a minimum of time. A .22 or .38 caliber blank cartridge, containing a special explosive is inserted in a driving "gun" with a pointed stud of specially hardened steel. Firing the gun drives the pin through steel anchor plates into brick, concrete, or steel beams. Shields and grip safety devices protect the operator when in use, and prevent accidental discharge. Other studs with threaded ends can be driven in through standard dresser heads.

THIS VERSATILE RADIAL SAW is fitted with a power feed, taking over the operator's work, and assuring safety against kick-backs when ripping. Power feed is driven by a separate motor, and the speed of the work may be varied from 22 to 90 feet per minute.

Capacity, durability and precision, we believe you will agree. That's why extra capacity, unusual stiffness and real precision have been built into the

BOICE-CRANE 10" TILTING-ARBOR SAW

Square off work up to 15 inches wide without costly front extensions. Precision is MACHINED into every part. Important parts, such as the ripping fence, aren't stamped or die cast but MACHINED FOR ACCURACY. The 28° cast iron rip fence is precision ground both sides. Large transitions assure super-accurate blade alignment. Gouges are accurate, easy to read. The 1/4-inch arbor and bearings the heaviest of any 10" saw. Handles heavy overloads. The only 10" saw which can be driven by low cost standard motors or lineshaft (even gas engine). The motor is entirely separate from machine and away from dust, keeping vibration from the arbor, eliminating needless wear on trunnions. Powerful V-belt drive transmits up to 3 H.P. Front fence aligns saw operator reaching over blade to set. Accurate alignment on fast lock-up. One-hand, lightening fast, automatic control of both hand and rear fence locks. Conveniently grouped controls quickly kill, raise and lower blade. Positive locks. Fine motion for patented setting and adjustable stops for 45° and 90°. Approved safety guard shields entire saw blade, lifts with blade. Dust chute encloses blade, discharge saw dust away from motor. Table 20" x 22". Blades: 10" dia., max. Depth of cut: Saw Vertical 3"; Saw Tilted. 21/4" Bench or floor models.

The Saw That Was Designed With the Average Shop in Mind.

THE BOICE-CRANE 14" BAND SAW

Versatility... Cuts, sands, grinds any material... accurately and quickly.

Speed... 2 to 4 times faster. Blade speed up to 4,100 f.p.m. at 1200 r.p.m. Vibrations almost nil.

Capacity... Up to 24" thick, blades 5/8" to 1 1/4" wide.

Safety... Entirely enclosed, except at cutting point. Single control blade grinds safely adjusted, even when radiation safe. Overall height of rear model: 63" x 15" x 15 1/2" wide. Table fits on double trunnions. Sealed motor compartment in base.


AVAILABLE NOW through industrial supply distributors.

The only 24" jig saw that cuts materials up to 2" thick and accommodates blades 3" to 9" long. Wider range tensioner correctly tensions up to heavy duty 5/8" blades to guarantee a square face or plumb curve. Blades may be turned 90° for ripping long stock. Two adjustable blade guides. 50% longer blade stroke (1 1/2"). Does accurate, clean contour and straight cutting, inserted blade work, dia filing, saber sawing and sanding.

OVERSIZE, precision ground, highly polished cast iron work table (20" x 20") lifts 45° two ways. Ball-bearing Powerful dust blower. Overall: 39" high, 20" wide, 38" deep.

BOICE-CRANE COMPANY

966 Central Avenue, Toledo, Ohio

Please send free literature on:

[ ] Tilting Arbor Saw [ ] Saw-Jointer [ ] Band Saw [ ] Jig Saw

NAME

STREET

CITY & STATE

APRIL 1952
Better Design

makes the difference
- in easier handling
- faster sawing

Model 160
6" Saw

Model 180
8" Saw

Model 160—Straight cut: 2" max.; 1 1/4" min. Bevel cut at 45°; 1 1/4" max.; 45° min. Net weight 10 lbs. 8 oz.

Model 180—Straight cut: 2 29/32" max.; 1" min. Bevel cut at 45°; 2 11/16" max. Net weight: 17 lbs. 8 oz.

BRADFORD

ELECTRIC SAWS

Bradford engineered design has taken the awkward "bulk" out of old-time powered hand saws — and created a streamlined, precision tool that glides through the work with easy, effortless control. Only a Bradford has the fine balance that gives greater ease of handling in any working position.

Bradford Saws are designed inside and out to take on the toughest sawing jobs. Ball bearings with permanent lubrication are used throughout. Heat-treated alloy steel helical gears give maximum driving power and quiet, cool-running efficiency.

Own a Bradford — they are popularly priced and the choice of craftsmen everywhere. See your tool supplier for a demonstration or write direct for free bulletin giving complete specifications and prices.

The BRADFORD MACHINE TOOL CO.
654 Evans Street  Cincinnati, Ohio
Precision Since 1840

THE RADIAL SAW finds use in rafter notching, cutting joists and studding, making forms, and many other jobs. Trailer-mounted units are available for easy transport from job to job. It can be driven to anchor pipe hangers, electrical boxes or wood panels to masonry or steel.

Another portable stud-attaching device for steelwork makes use of the resistance welding principle. A small power supply is connected to a 110-volt current, and leads go to a stud-setting gun. Threaded end studs are inserted, a trigger is pulled, and perfect welding is automatic. The studs have ceramic collars for confining the weld to the base of the stud and forming a strengthening fillet.

PRODUCTION POWER TOOLS

Production power tools such as power saws, pipe-threading machines, and arc welders, are normally taken to the job site for use, but are too bulky to be carried around the job by one man. Most of the heavy work on the job is done by these tools, and they represent one of the most important investments of the contractor.

Power Saws

Power saws for woodworking are generally either table saws or radial saws. The table saw has the blade stationary with respect to the work, which is fed to the blade, while the radial saw has the blade and motor assembly mounted on a pivoted arm, along which the saw is moved with relation to the work.

Table saws are powered either by electric motor or gas engine and are made in all sizes to handle work up to the heaviest timbers. Those designed for trim and cabinet work have tilting tables or tilting blade assemblies (preferred, as the work remains flat at all times), accurate settings for miter and bevel cuts, and may also be used for dadoing and ploughing grooves. Slaper cutter heads may be mounted so that moulding heads may be cut on the saw. Accurate ripping and cross-cutting guides make quality finished work easy for the workman.

(Continued on page 192)
NO STARTING HOLE NEEDED
CUTS DIRECTLY INTO MATERIAL!

Just hold the Super Saw tightly against the material and use the guide as a fulcrum to "rock" the tool into a vertical position. Roughing in for toilet bowl through oak flooring, for instance, is completed in less than three minutes!

CUTS RIGHT THRU IMBEDDED NAILS,
CUTS ALMOST ALL MATERIALS

Wood, even with imbedded nails, plaster, transite pipe, formica ebonite, iron pipe, sheet metal and a host of other materials are easily and quickly cut with the Super Saw—even in those hard-to-get-at places which prevents a full-size saw stroke!

FITS HEAVY DUTY 1/4" OR 5/16" DRILL

Simply insert the drive shaft into the drill chuck (2,000-5,000 R.P.M.), tighten chuck and the Super Saw is ready for use. (Also accommodates air drill or flexible shaft equipment.) Over-all length is only 10½" and the Super Saw weighs only 3 pounds 6 ounces.

BUILT FOR CONSTANT DUTY OPERATION

Built-in blower keeps the Super Saw comfortably cool even when used continuously and air stream is directed so that chips or saw dust do not obscure the work. All friction surfaces are of oilite, phosphor bronze or high speed ball bearings; all wearing parts are replaceable.

SUPER-SAW BLADES AND LUBRICANT

Six standard blades of various lengths, tooth sizes and thicknesses give Super Saw its extreme versatility and keep blade replacement costs to a minimum. Special Super Saw non-fluid lubricant is supplied in tube which screws into grease fitting in Saw case; "one-shot" lubrication saves time, gives complete protection to moving parts.

Saves you more actual time, right on the job, than any other tool in your kit!

Try it Yourself!

See the Super Saw at your Jobbers! Inspect it, try it! You'll agree that no other tool offers Super Saw's lifetime construction at such low cost... no other tool provides such drastic reduction in labor costs! Send the coupon today!

R. C. S. Tool Sales Corporation
Joliet, Illinois

R. C. S. Tool Sales Corporation

Gentlemen:

Please send us Bulletin L4 and name of the nearest Super Saw distributor.

Name
Address
City Zone State

APRIL 1952
Table saws for rough carpentry lack the precise adjustments of lighter units, but will handle larger work continuously. Table sizes are larger, blades are of greater diameter, and heavier motors are needed. Some of these units have the blade and shaft attached to a pivoted arm so that the saw may be pulled through the work, rather than feeding the work to the blade. This keeps the blade below the table surface except when actually cutting—an added safety feature. All table saws are fitted with blade guards, splitters to keep the work from binding the saw, and anti-kickback devices for operator protection. Most insurance companies require the use of the safety measures, and foremen and superintendents should see that they are in place at all times.

Radial Arm Saws
Radial arm saws, because of their great versatility, are fast becoming the builder's most popular saw. The radial adjustment of the arm on which the saw moves back and forth, and the rotation in a vertical plane of the motor and blade assembly combine to make possible any conceivable type of cut in lumber. The fact that the saw moves rather than the work is a distinct advantage in handling heavy work such as joists and rafters. Table extensions (which may be fitted with rollers) permit accurate repetitive cuts. Dado heads may be ganged with spacing washers for cutting tenons, and motor may be swung vertically for shaping.

Radial saws may be trailer mounted for ease in transport from one location to another, and can be set up for operation in minutes after being spotted on the job. Home builders find the 8-inch and 10-inch blade sizes most efficient for handling work up to 4-inch thickness. Motors required are from two to five horsepower.

Band saws find on-the-job use where any quantity of cabinet work is done. Cornices and valances are turned out in quantity with templates. Trim for bookcases and built-in fireplaces can be made to fit, rather than trim precut pieces.

Power Hack Saws
Power hack saws, widely used by plumbing, heating, electrical and ironwork contractors cut pipe, rods, bars, beams and angles quickly and with greater accuracy than does a torch. Sawed ends of pipe need no reaming, and there is no burr left to retard the pulling of wires in conduit.

Two types of power hack saws are made. The reciprocating model

(Continued from page 190)
Many thousands of dollars were saved by the modern DRIVE-IT powder operated fastening method used on the Park LaBrea project in Los Angeles. Over 750,000 drive pins fastened metal lath to concrete ceilings and floors from which wall partitions were secured.

**split-second fastening to concrete steel**

**EXCLUSIVE DRIVE-IT FEATURES**

**UL**

DRIVE-IT is the only powder-actuated tool approved by Underwriters' Laboratory.

Exclusive Swivel Safety Pad easily rotated for getting into close quarter work.

DRIVE-IT is the only powder-actuated tool which requires but one standard power load regardless of penetration desired.

DRIVE-IT cannot be discharged accidentally due to the push and turn sequence. This, plus the large safety pad makes DRIVE-IT triple safe.

Exclusive Automatic Barrel Extension for fastenings inside junction boxes or other recesses.

Drive-it "300", lowest cost fastening tool... Low original cost and low operating cost.

**MAIL THIS COUPON TODAY!**

Powder Power Tool Corp.
0719 S. W. Woods St.
Portland 1, Oregon

☐ Please send FREE catalogue and literature.

☐ I want a FREE demonstration of DRIVE-IT.

Name ____________________________________________

Street ___________________________________________

City ____________________________________________ State _________
Before You Buy Any PORTABLE POWER SAW

Check For All These Features To Make Your Work EASIER, FASTER More ACCURATE...

Model 86 MALLSAW Gives You All These Performance Advantages:

- Easy to Use in Either Hand
- Handy on Ladders, Scaffolds, Roofs
- Readily Adapts to Cut Any Materials
- Powered by Heavy-Duty, Universal Motor

Expect years of dependable, trouble-free service from a Model 86 MALLSAW — a lightweight but powerful tool that speeds any sawing job. Supplied with 8 1/2” dia. combination blade, cord, lubricant, wrench — all in handy metal carrying case. Extra blades available for dadoing, grooving tile, concrete; cutting light metals. Choose and use this handy MALLSAW — a quality tool, through and through!

See Your Nearest MALL Dealer — Or Mail Coupon for Latest Catalog.

THE MASONRY SAW uses either abrasive or diamond-tipped wheels, and will cut limestone, brick, cinder or concrete block, terra cotta, transite, marble tile, and granite.

Uses a straight blade which is drawn back and forth, automatically raising on the non-cutting stroke. The hand-saw type has the blade angled slightly in relation to the plane of the drive wheels, so that work of any length may be cut. This is the most popular power metal-cutting saw. Size is determined by the maximum thickness of work that may be cut; electricians find about a 6-inch size best, while plumbers and heating contractors will use sizes from 4 to 8 inches, depending on the biggest pipe handled on the job. Automatic stops are provided for duplicate work, such as cutting air chambers, and an automatic stop shuts the saw off at the completion of the cut. Adjustable vises hold the work at any angle, and the cut is straight and smooth, almost as good as can be had with a milling machine.

Masonry Saws

Brick, tile, and concrete block cutting saws have almost entirely replaced the tedious cutting of brick for odd-angled corners and cutting of concrete blocks to fit. A bonded abrasive wheel is generally used, although carbide and diamond toothed saws are available. The brick or tile to be cut is moved back and forth under the saw on a traveling carriage, and the saw is lowered into the work as cutting progresses by a foot pedal. Provision is made for wet cutting of extremely dense ceramics.

Power Drills and Drill Presses

The home workshop type of drill press, easily moved from job to job, is especially popular for cabinet work operations at the site. More accurate than the hand drill, these tools can also be set up with the proper at-
ONLY THOR OFFERS
SO MANY FEATURES

IN PORTABLE
ELECTRIC SAWS

Silver Line means "new design"—from rip guide to switch—to give you the safest, easiest handling, most powerful saws on the market today. 15 new features... many of them exclusive... each of them thoroughly field tested and approved for economical, trouble-free operation. Six sizes to meet every demand from the lightweight "6" to the sturdy "12". Try these great new Silver Line Saws now available at your Thor distributor. Independent Pneumatic Tool Co., Aurora, Illinois.

EXCLUSIVE LONG-SHAFT TRANSVERSE MOTOR MOUNTING transmits as much as 25%, extra power, supports blade on oversize ball bearings from one side of the tool clear to the other.

EXCLUSIVE SAFETY-LOCK SWITCH—positive protection against accidental starting.

EXCLUSIVE SHOCK-ABSORBER GEARING harnesses the added power of these great new saws, gives extra life to motor, gears, spindle and blade.

EXCLUSIVE PROTECTED DEPTH AND BEVEL SCALES are in plain sight when you use them—out of the way when you don't. Always accurate.

EXCLUSIVE EXTRA-WIDE REENFORCED STEEL SAFETY BASE for better balance—easier to handle, far safer to use.

PLUS powerful, built-in sawdust blower... oversized ball bearing construction... automatic ball bearing blade-guard... die-cast aluminum housings... steel inserts for bearings and threads... fingertip depth and bevel control... convenient handle... steel rip guide... additional capacity switches... most powerful motors ever used in electric saws.
Stanley Chisels are designed to give your work the clean, smooth appearance of superior craftsmanship. Forged from the finest chisel-steel made, Stanley blades are carefully heat-treated and accurately tempered to bring you keener-cutting, longer-lasting edges. Cross grinding assures perfectly proportioned bevels. Nicely balanced for better control.

Ask your hardware dealer to show you Stanley Chisels—available in a full range of styles and sizes. Stanley Tools, New Britain, Conn.

No. 60. Finest Chisel steel, blades heat-treated and tempered to hold keen edge. Blow-centering steel crowns protect tough plastic handles. Blades sized 1/4 to 2 inch. Also available in handy plastic kits.

No. 750. Rugged, butt style socket chisels. Seasoned hickory handles copped with leather washers. One-piece high quality steel blades and sockets—no welded joints. Blade sizes 1/4 to 2 inch. Also available in convenient plastic kits.

THE DRILL PRESS has adjustments permitting use as a shaper, router, mortise cutter, and for rapid drilling of either wood or metal.

(Continued from page 194) Attachments for light duty as sharpeners and routers.

Power Sanding Equipment

Power floor-sanders are a necessity for every contractor. Much of the satisfaction of a finished home is in a carefully finished, fresh floor. Drum-type sanders handle large center areas quickly, while the edges and corners can be touched up with smaller units or hand disc sanders. The builder who does his own mill and cabinet work may find it desirable to have a belt sander on the job. This may be either a small belt machine, for smoothing edges of doors, or a large model, with traveling table for holding the work underneath the belt for panels.

THE SPINDLE SHAPER enables the contractor to save by making his own mouldings and trim. The unit shown above has two speeds, 7000 and 11,000 r.p.m. for different size cutters, and a vertical adjustment range of three inches.

THE JOINTER is mounted on a stand and powered by electric motor.

RESIZED SPEED-GRITS PAPERS

Any way you look at it!

On the face, look at the sharp, steady working grains of Silicon Carbide, the "grinding wheel grit" abrasive grain. Our DURABONDED® and RESINIZED processes doubly anchor these grains to give you the finest possible abrasive covers.

On the back, you see the familiar BEHR-MANNING triangle trade mark that identifies an abrasive product line that has undergone thousands of hours of laboratory experiment, research and testing before you even put it on a sanding machine.

And on the job, watch the cover that cuts clean, smooth and fast for a far longer time without wild grain troubles, loading or limping.

WE'LL PROVE IT on your next job, with a free demonstration of RESINIZED SPEED-GRITS PAPERS. Tell us when and where — write today. Address Dept. AB-4.

Write for your copy

The "ABRASIVE GUIDE FOR FLOOR SANDING PRODUCTS" is full of handy information, net prices, etc. Address Dept. AB-4.

BEHR-MANNING
TROY, N.Y.
division of NORTON Company

AMERICAN BUILDER
RADIAL ARM FOR MOUNTING ELECTRIC HAND SAWS has cut off movement of 24 inches. Bevels or miters 0 to 45 degrees left or right. 3/4 inch vertical adjustment.

Routers and Shapers

Although it is not common to find shop-type routers and shapers on the job, the contractor who is building a volume of units at one location may cut costs by making his own moldings and trim from undressed lumber. Power routers and shapers may be set up in a temporary cabinet and trim shop, and turned out on a quantity basis at a considerable saving.

Planers

The thickness planer, which planes rough lumber to finished size, will permit a saving in areas where rough boards are to be had at substantially lower cost. The boards are power-fed by rollers into revolving blades, giving a fine finish needing only light sanding. The jointer is a similar tool, in which the board is passed over a revolving head carrying the knives. Adjustments of the front table allow a shaving of any desired thickness, and a tilting fence permits accurate beveling. A separate section of the table permits rabbeting faster and more accurately than with a hand plane.

(Continued on page 200)

JOINTERS ON THE JOB in small operations are being used in many instances to save on material costs and time. They are available in a wide variety of sizes and prices.

APRIL 1952
One of today's outstanding projects is the 1,000-house job at Fort Bragg, North Carolina.

This military housing project is being built by T. A. Loving and Company of Goldsboro, N. C. and W. H. Weaver Construction Company of Greensboro, N. C.

The houses and apartments in this project were prefabricated by American Houses, Inc., who have over 60 DE WALT SAWS in operation in their three plants for precision cutting and mass assembly of a wide range of house models and designs.

This example of the use of DeWalt for precision cutting for multiple construction should interest all builders.

The building market is rapidly changing. You may want to devote your future efforts to other types of building: defense housing, military housing, low-cost rental housing, special wood structures, etc.

No matter what type of building you do—whether for a single structure or for a thousand—you have a valuable asset when one or more DeWals are on the job. You build faster... better... more accurately... and at lower cost.

DeWalt models are available from 1/2 H. P. to 7 1/2 H. P.

Shown on this page is the newest DeWalt GR—the "builder's saw." This model has 5 new features, including low dead rise motor which permits deeper cut. See what all five features mean to you by seeing an actual demonstration! Your DeWalt dealer will show you. Send coupon below for full information.

MAIL THIS COUPON TODAY!

DeWalt, Inc., 13 Fountain Avenue, Lancaster, Pa.

Please send me literature and complete specifications on the new DeWalt GR.

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NEW DUAL V-BELT DRIVE

PORTABLE ELECTRIC SAW

$89.50*

BY SYNTRON

DUAL V-BELT DRIVE
— provides that "Velvet Smooth", faster, easier cutting — eliminates gears — cushions motor shock.

You'll find it hard to beat the powerful 6000 RPM cutting speed of this new SYNTRON Saw — trimming sub-flooring, fitting doors, seat and ridge cutting in roof framing, trimming roof sheathing and many other jobs.

When equipped with either abrasive discs or a diamond grit blade, the SYNTRON Saw easily cuts or scores tile, brick, concrete, terrazzo, etc.

In fact — once you have a SYNTRON Saw, you'll be surprised how many jobs you find on which to use it and how much time it saves.

*Price complete with combination saw blade and wrench, 15 ft. 3-conductor cable and instructions. Heavy duty carrying case at $8.00 extra.

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SYNTRON COMPANY 618 Lexington Avenue HOMER CITY, PENNA.

APRIL 1952
SAMSON BAR CUTTERS

- All Steel Construction
- Unbreakable Frame
- Easy Operation
- Immediate Shipment

Pipe Threaders and Cutters
Power pipe threading and cutting machines cut costs for plumbers, electricians, and steamfitters. In typical machines, the pipe is held in a chuck and rotated against a stationary cutting wheel and threading dies. Built-in pumps automatically feed cutting oil as the thread is being cut, and quick-opening die-heads eliminate lost motion in running the thread back. Pipe machines will handle work from 3/4-inch to 2-inch pipe, and will also power drive shafts for cutting and threading pipe up to 8 inches. With a pipe machine a mechanic can cut and thread 60 pieces of 3/4-inch pipe an hour, or can cut a 2-inch thread in 22 seconds—an enormous saving in time.

Welding Tools
The familiar acetylene torch is so familiar a part of building equipment as to need little comment. It is a “must” for burning rods, cutting beams and angles, repairing machinery.

Special Tools
In addition to the common tools that are used on all types of work, manufacturers have developed an incredible variety of tools for special work. Among those which may be mentioned are: pneumatic hammers for installing ceiling panels, automatic saw sharpeners, induction heated glue presses, and pipe-bending machines.

SELECTION
As portable power tools will represent a major investment on the part of the contractor, careful selection should be made before purchasing. No tool should be bought unless the economies effected by its use will more than offset the cost of the tool. In many cases the saving will be immediate. One contractor estimates that a power hand saw pays for itself in the first two months of use. Other tools, such as welders, may require two or three years of use before they pay for themselves. If it is possible to analyze the savings to be gained by the use of power equipment, this should be done. It may be found that tools which will be used only on one job, or only occasionally, may better be rented or borrowed from another contractor than purchased outright. On the other hand, if it is known that a tool will save money, then it should be bought as soon as possible.

It is poor economy to buy under-

two SPACE-SAVING WOODWORKING MACHINES FOR YOUR PLANT

Whitney 105 SURFACER — 24” wide. Planes stock 1/16” to 8” thick. Feeds, 20 to 60 ft. per min. with Micro-feed Selector and Feed Indicator.

THESE Whitney Machines are accurate, dependable, economical. They have been developed especially for the contractor’s and builder’s shops and the average woodworking shop to do the job and to save space. They are the result of over 100 years’ experience producing precision woodworking machinery. These machines will give BIG machine performance, occupying small floor space.

Write today for complete information. Ask for bulletins P2 and S2.

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Winchendon, Massachusetts, U. S. A.

ATTENTION!
JOBBERS AND DEALERS
Profitable possibilities for aggressive distributors. Wire, write or phone.

TRI-SAW CORPORATION
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powered tools. The tool with a power rating more than adequate for the job will perform better, last longer, and be less likely to break down than the one which is "almost" big enough.

**MAINTENANCE**

Proper maintenance will do more than any other one thing to insure trouble-free performance and long tool life. Lubrication, cleaning, and checking for worn or defective parts should be a regular routine. Responsibility for maintenance should be specifically assigned, rather than left to chance. Safety attachments should be inspected to see that they are in use and correctly installed. Manufacturers' recommendations should be followed for lubrication and maintenance. Use the correct grade of lubricants. Make periodic adjustments for wear if these are provided. Repairs which require factory attention should not be attempted in the field with make-shift or substitute parts.

**Mechanization Cuts Costs, Reduces Time**

Mechanization in the construction industry as a whole has been steadily increasing during the past 25 years, with World War II providing considerable impetus to the whole field. The development and improvement of earth-moving equipment now permits large scale excavation and site preparation within a fraction of the time formerly required. At present the range of this type of equipment available for both large and small jobs, including housing, has made this one of the most versatile of construction operations.

Recent developments would indicate that, with the range of tools suitable for on-site operations steadily increasing, there are increased opportunities for realization of cost reductions by even the small builder.

**SOIL COMPACITION with the Barco Rammer has been the key to earlier completions and lower costs for us," says Paul Schleicher & Sons, Gary, Indiana, housing contractor.**

The Barco Rammer is a new tool with many uses! No longer is it necessary to wait for loose earth fill, or backfill, to settle— tamp it immediately to HIGH DEGREE COMPACITION under slabs... around foundations and footings... on grades... in trenches —SAVE TIME! CUT COSTS!

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See for yourself—ask for our nearest distributor to give you a demonstration.

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**BARCO MANUFACTURING COMPANY**
1823E Winnemac Ave.,
Chicago 40, Illinois

**Builders of Portable Gasoline HAMMERS and RAMMERS**
In addition to the many time-saving, money-saving, and structural advantages of Stran-Steel nailable framing, architects and their clients will appreciate the permanent protection offered by this non-combustible framing material. Specifying Stran-Steel roof systems and floor joists can mean the difference between a costly fire and one that is easily localized and controlled. Also, architects can point to lower insurance costs possible with Stran-Steel framing.

The versatility and strength of Stran-Steel framing make it easily adaptable to the latest trends in design. And the speed with which the precision pre-cut members can be assembled brings a worthwhile reduction of in-place building costs. Close-in time is shortened, and interior work can proceed before exterior completion. The nailability of Stran-Steel framing means additional economy, too, in the application of collateral materials.

If you are planning new industrial or commercial construction, or schools, hospitals and similar structures, it will pay you to investigate Stran-Steel framing. Complete literature available on request, or see Sweet's catalog service, architectural and builders' files.
METAL building products used in light construction are far too numerous to catalog or describe in detail in this article. Plumbing, heating, wiring, appliances and fixtures in bathroom and kitchen, as well as numerous structural parts of the house use metal, either because of cost, ease of handling, strength, wear resistance, or some other special property no other material possesses for the job.

STRUCTURAL MEMBERS

The American Institute of Steel Construction specifies twelve advantages to steel construction: strength, uniformity of material, endurance under stress and service load, toughness against shock, adaptability, versatility for design, fire safety, compactness in space, speed of construction, salvage value, economy of material, and service from a giant industry.

Framing

Steel joists and complete steel framing in light construction have been found economical by many builders. Panel assemblies with nailable steel framing members may be partially fabricated at the shop of the steel distributor. Shop prefabrication can be supplemented by site cutting and final assembly. Assembling steel members on the site requires a powersaw and portable welders. The nailable feature of the framing members makes it possible to apply other conventional materials to studs and joists with 8d nails.

Insulating board sheathing may be applied directly to the studs for the exterior wall. Dry-wall construction is possible inside without furring because of the nailable feature of the studs.

A number of manufacturers are now producing a wide range of stand-

LIGHTWEIGHT steel beams form sunshields and porch in this modern design. At right, workman bolts roof purlin to larger structural beam running length of house

APRIL 1952
DETAIL shows insulation installation with nailable steel studs. Masonry anchor is nailed to studs with 8-penny nail. Hook nails hold insulation securely.

Columns and Posts

The familiar concrete-filled steel column has long been recognized as one of the strongest building members. It is fire-resistant, economical to install, and takes little space. These columns may either be fixed or adjustable, and may be filled with concrete by the manufacturer or on the building site.

These columns are available in diameters from 2½ inches to over 12 inches, and lengths from 5 feet to 20 feet. Fitting in with modern demand for maximum usable floor area, these columns usually require from ½ to ⅓ the space that "H" column boxed piers would need. They may frequently be concealed in the thickness of walls or partitions for a further gain in space saved.

Reinforcing Rod and Wire

Reinforcing rod and wire mesh play an important part in concrete slab construction. Most prefabricated

COPPER is popular for flashing because of its long-lasting qualities and ease of installation.

DETAIL of nailable steel framing which is erected with ordinary carpenter's tools. Grooved framing sections make it possible to drive nails into the metal framework. Concrete slabs and joists embody some form of reinforcing rod. Load-bearing walls of combined brick and concrete construction usually contain rods also, and site-fabricated concrete slabs for floors, as well as for driveways and walks, usually contain wire mesh fabric of some kind. Other kinds of wire mesh are used for reinforcing concrete siding and for reinforcing the mortar used in tying brick veneer to sheathing.

CUTAWAY to show how nailable steel framing is screwed to channels. With steel sheathing nailed to top, on which concrete is poured with wood flooring laid over.

Steel rod is also used to anchor ends of joists to concrete or masonry supports. When they rest on steel supports, welding is preferable. Steel strap functions similarly in holding up pipe, conduit, and ductwork in many locations throughout the modern building.

ROOF GUTTERS and downspouts are available of galvanized iron, stainless steel, copper and aluminum. Strength, durability, and tightly-sealed joints are important.

FLAT, square, and small-diameter tube shapes are popular for heating ducts in modern installations.
Larger discount • Faster turnover • Greater profits when you sell

the BENNETT complete line of sales proven fireplace supplies

Bennett—and only Bennett—offers you a complete line of fast-moving, profit-building fireplace supplies. So, when you standardize on Bennett, you can combine purchases—take advantage of top discounts. And... customer acceptance of Bennett fireplace products is as complete as the line itself. Recognized quality... continuous national advertising... assure that!

Let us tell you why you save money... in larger discounts, lower transportation costs, bigger dollar sales, faster turnover... when you sell Bennett. Write for free catalog and complete information to Bennett-Ireland, Inc., 452 Market Street, Norwich, N.Y.

BENNETT
Cast-Iron Damper

Bennett Cast-Iron Damper—quality at competitive prices. Superior casting facilities in our own foundry enable us to produce this steep 30° slope damper, with interchangeable Rotary or Ratchet Control feature. With guaranteed steel valve or cast-iron valve.

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- Warm-Aire Fireplaces
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BENNETT - IRELAND INC.
Chartered in 1906
NORWICH, NEW YORK
IMPERIAL STEEL AREAWALLS
NATION'S BEST in QUALITY, STRENGTH and DESIGN

LUX-RIGHT AREAWALLS! The Original and ONLY Areawall with Hot-Dip-Galvanized AFTER forming. Every edge, every surface thereby protected from corrosion. Two Types: Streamlined-Straight and Round. Both Types come in a wide range of sizes.

HUG-TITE FLANGES—on all LUX-RIGHT easy-to-install one-piece units save time, labor and money. Hardened masonry nails supplied with each unit. No upkeep expense. Last word in long-lasting service. Free illustrated folder shows sizes, proper installation, much other helpful information. See your distributor, builder, Homeowners everywhere. Often imitated, never equalled.

Builder: These LUX-RIGHT easy-to-install one-piece units save time, labor, money. Hardened masonry nails supplied with each unit. No upkeep expense. Last word in long-lasting service. Free illustrated folder shows sizes, proper installation, much other helpful information. See your distributor, builder, Homeowners everywhere. Often imitated, never equalled.

Owner: "TM REG. U.S. PAT. OFF.

SAINT PAUL CORRUGATING CO.
Expert Sheet Metal Manufacturers for 67 Years
SOUTH END WABASHA BRIDGE - SAINT PAUL, MINN.

STEEL RODS and bars used with concrete column and slab construction. Two Types of bars are shown.

FUNCTIONAL SHAPES

STEW NOTES: Exciting steel fittings are easy to use and can be used to level up floors. Right: Steel wire reinforcing mesh.

Building materials dealer, or write us direct.

STEW NOTES: Exciting steel fittings are easy to use and can be used to level up floors. Right: Steel wire reinforcing mesh.
PORCHES and PATIOS help sell homes

Exceptional strength and durability are imparted to concrete construction by this "backbone" of high tensile strength steel. The slabs are "knitted" together, expand and contract as a unit, thus resisting cracking, spalling, and heaving.

These pleasant centers for family gatherings make any home more attractive to the discriminating buyer. Built of concrete, reinforced with American Welded Wire Fabric, they add to the appearance, comfort and actual dollar value of a home.

Other powerful sales aids are concrete foundations, walls, floors, driveways and sidewalks. Home buyers know that concrete construction retains its original beauty year after year, free from unsightly cracks, when properly constructed and reinforced with U-5-S American Welded Wire Fabric.

It costs surprisingly little to reinforce all the concrete construction in and around your homes with American Welded Wire Fabric; yet the added value is a potent advantage when it comes to closing a profitable sale.

In every locality, American Welded Wire Fabric is readily available from jobbers' and dealers' stocks. Send for our illustrated folders. Just drop a line to our nearest sales office.

AMERICAN STEEL & WIRE DIVISION
UNITED STATES STEEL COMPANY
GENERAL OFFICES, CLEVELAND, OHIO
COLUMBIA-GENEVA STEEL DIVISION, SAN FRANCISCO
PACIFIC COAST DISTRIBUTORS
TENNESSEE COAL & IRON DIVISION, FAIRFIELD, ALA.
SOUTHERN DISTRIBUTORS
UNITED STATES STEEL EXPORT COMPANY, NEW YORK

Every type of concrete construction needs

AMERICAN WELDED WIRE FABRIC
reinforcement
Types and Styles of Metal Trim

8 BASIC GROUPS • Metal trims are divided into eight groups shown on this page. Each group includes several different styles of trims for the same general purpose. For example, nosings include those with flanges that extend under the coverings; those with a flange which fits into a groove; and those without flanges. Also, many Chromedge sections are not limited to a single use. For example, No. 102, a nosing listed as an INSERT TRIM, is also used as a cap trim. These trims are classified as to their most frequent use.

CAP TRIMS • For upper edges of dado, wainscot, or cover-base. Those with a projecting lip at upper edge in back can be used also as nosings.

WALL TRIMS • or divider bars—conceal joints between panels of either like or contrasting coverings, used for decorative paneling.

INSERT TRIMS • Shown separately because of colorful inserts this group includes nosings, wainscot caps, corners and coves.

COLOR RECESS TRIMS • This group of nosings features painted recesses for decorative beauty.

PRICE TAG TRIMS • A separate group of nosings for specialized use. Available for all standard price tickets held by grooves in moldings.

CORNERS AND COVES • Inside and outside corners, horizontal or vertical. Many have matching end stops and corner fittings.

EDGINGS AND BINDERS • These trims bind, seal or protect edges of coverings where exposed to wear, stress or moisture. Includes sink-wall edgings, carpet-bindings, threshold saddles and similar sections.

NOSINGS • For outer edges of bars, counters, cabinets, tables, sink tops, drain boards, stair treads and similar points. Nosings with flat backs serve also as wall trims. Those with a raised lip provide non-drip counter edges.
LEIGH BUILDING PRODUCTS
— will give added convenience, beauty and saleability to your homes.

The Leigh Line is a complete line of metal building necessities that have received universal acceptance from home owners and builders. Each unit is built to fill a definite need in a more attractive and efficient manner.

Use Leigh Products on your new homes or remodeling jobs. You'll find they add that extra touch that closes the sale.

SHUTTERS

DOOR CANOPIES

WINDOW AWNINGS

MAIL BOXES

CLOTHES CHUTE DOORS

PACKAGE RECEIVERS

RECESSED SHOE RACKS

BUILT-IN DUST CHUTES

SWING-AWAY GARBAGE CONTAINERS

SCREEN DOOR GRILLES

FLOWER BOXES

BUILT-IN MAIL CHUTES

ATTIC VENTILATORS

ROOF VENTILATORS

ADJUSTABLE TRIANGLE VENTS

ADJUSTABLE CLOSET RODS

HEAVY DUTY FOUNDATION VENTS

BRICK VENTILATORS

FOUNDATION VENTILATORS

THRU-THE-WALL VENTILATORS

If you do not have a copy of the latest Leigh Catalog 52-L showing the complete Leigh Line — Write us direct for your free copy.

LEIGH BUILDING PRODUCTS DIVISION

COOPERSVILLE

AIR CONTROL PRODUCTS, INC.

MICHIGAN

APRIL 1952
Sun-struck Windows of Lockheed Aircraft Corporation's Burbank, California plant created eyestraining glare, allowed heat rays to penetrate glass, caused uncomfortably high inside temperatures. Appearance of building exteriors was spoiled by unevenly adjusted blinds and the open and closed windows.

Kaiser Aluminum Shade Screen now covers 10,000 square feet of windows on 7 buildings of the Lockheed plant. Thousands of tiny louvers deflect hot rays before they hit glass. Result: Glare eliminated. Interiors up to 15% cooler, more comfortable for work. Exteriors dramatically improved by uniformity of windows—emphasis of modern, horizontal lines.
WITH ALUMINUM

THERE'LL BE plenty of aluminum available for tomorrow's building requirements as a result of today's industry-wide expansion.

Kaiser Aluminum alone is building new facilities which will increase its pre-Korea production of primary aluminum by 132 per cent!

So make your plans now to utilize the many advantages of light, strong, corrosion-resistant aluminum.

Check Before You Substitute

Most Kaiser Aluminum today goes to help meet the needs of the national security program. That's why it is not always readily available.

However, before you specify less-satisfactory substitute materials, ask for Kaiser Aluminum.

You may still be able to give your clients the best—Aluminum!

A Few of Today's Modern Aluminum Applications

Building materials made of Kaiser Aluminum offer exclusive advantages in design, beauty, and quality. Shown here are a few recent applications that prove aluminum is your best building material for tomorrow's plans.

Write for Information


Kaiser Aluminum Sidings. ideal for building or remodeling, gives sparkling modern look to Malley's Candy Shop, Cleveland. Weatherproof, rot-proof, rust-proof, aluminum siding lasts for generations. Baked-on enamel coat gives smooth surface that looks better, is easy to clean. Designed and erected by Lumi Land Distributing Co., Rocky River, Ohio.

Kaiser Aluminum Roofing on these Liggett & Myers tobacco warehouses is strong, solid corrugated aluminum. Bright surface reflects sun's rays—helps maintain uniform inside temperatures, often so important in warehousing goods. Specified by owner W. O. Crombie of Paris, Ky., because of aluminum's "complete lack of maintenance requirements."

Kaiser Aluminum Ductwork used in Los Angeles Times Building was fabricated right on the job, eliminating costly handling, trucking, storing of bulky pre-assembled sections. Easily fastened with rivets, by welding, or with sheet metal screws. Installed faster with less worker fatigue. And uninsulated aluminum delivers as much heat as insulated galvanized material at lower cost.

Kaiser Aluminum

Building materials for home, farm and industry
If you know the Trade Name but not the maker—

Look it up here

METAL conduit used for surface raceways for telephone lines is easy to install in remodeling operations.

(Continued from page 206)

Copper gutters, roof valleys and flashings provide durability which equals somewhat higher first-cost, and manufacturers provide a full range of stock gutters, downspouts, elbows, downspout heads, nails, and hangers.

Ducts and Pipe

Ductwork, pipe, conduit, and tubing are considered more in detail in the sections on heating, plumbing, and wiring the house. Nearly all types of structural metals are involved at some point, and manufacturers are constantly working with heating, plumbing, and electrical contractors to develop better products to serve these needs.

Cornices, Edgings

Architectural extruded metals may be bronze, brass, aluminum, nickel-silver alloy, copper, or other special alloys. As extrusions are wrought under pressure, they are usually free from blowholes and other defects common to castings, and have a high tensile strength. Extruded shapes can thus be used with thinner cross-sections, and finished with less labor. Primarily, such shapes include opening frames, entablatures, cornices, bars, flutings, pilasters, caps, counter screens, hand rails, edgings and beadings of all kinds. Some manufacturers stock standard shapes for

CEILINGS made with structural steel panels which are easy to install, have great rigidity, and fit into most designs.
Save Time and Boost Profits with Sink-Lok®

Another CHROMEDGE® aid

Faster - Easier - Foolproof

Here's the sink frame that really clamps coverings into place to stay—seals out moisture—hugs the sink with a tight, permanent, fit. Coverings can't work loose or curl up!

Easier to install, too! Sink-Lok frames overlap edges of the covering a full quarter-inch. No close scribing, cutting or fitting of materials. No special tools needed. No mortising or rabbeting of the sink-well hole—just cut a straight-walled opening for the sink. The frame anchors in place from underneath the sink top—supports the sink itself in addition to sealing the joint between the covering and the sink. No bolts or screws through the counter top.

Sink-Lok Frames are available for flat-rim sinks of any size, with either round or square corners, for installation on wood or plywood sink-cabinet tops from 5/8” to 1” thick, covered with any material up to 3/8-inch thick. Also available for most vitreous china sinks.

Write for complete information.

The B & T Metals Co.
Columbus 16, Ohio

HEATFORM
The Superior Heat Circulating Fireplace
most efficient and durable of all

Comparison Proves Greater Heat Delivery—because:

- More Heating Surface: air chambers surround front and upper front and side walls of the throat
- Larger roof air inlets and warm air outlets produce greater air circulation and more heat
- Contact of air to all heating surfaces due to multilevel converging air passages through and around the throat
- The heat surface of the stove and round air flows through the throat and one-third more heating surface

LONGER LIFE—because:

- Ribbed reinforced fibers add necessary strength to flat metal to control warpage. The ribs also add to the appearance of the front
- The larger air inlet and outlet equally produces a greater volume of air circulation which removes the heat from the hot metal faster, thus preventing mildew and deteriorating temperatures
- Masonry downdraft shelf—no exposed metal beneath chimney flue to rust out

SUPERIOR FORM DAMPER

Write for complete dealer information and distributor stock nearest you

SUPERIOR FIREPLACE CO.

The Pioneer Designers and Builders of Heat Circulating Fireplaces

APRIL 1952
SOUTHERN makes a complete line of WOOD SCREWS (Slotted or Phillips Heads)

Whatever your fastening needs may be, you'll find just what you want in the extensive Southern line of wood screws.

SIZES range from 1/2" No. 2 to 4" No. 20 in steel and 4" No. 16 in brass.

FINISHES are varied to meet your requirements—bright or plated finishes—nickel screws, chrome plated screws, lubricated screws for hard woods.

MATERIALS are the finest obtainable—high grade extruded brass wire, top quality selected sulphur steel wire, best nickel alloy.

CONSTRUCTION is rugged single-thread type to conform to rigid Federal Specifications—extra strong in body and shank to prevent breaking or twisting.

SPECIAL SCREWS made to your specifications at reasonable cost.

PACKAGING is sturdy for easy handling. Bulk screws are packaged in indestructible steel cans with sealed locking covers.

Southern wood screws are made in a thoroughly modern plant by the latest methods. Our unique inspection routine assures you of receiving a full quantity of uniformly perfect screws. Write today for our new catalogue.

FACTORY WAREHOUSES
118 Rickett Street
Statesville, North Carolina

SOUTHERN SCREW COMPANY

CORRUGATED window well. Several manufacturers provide round, oblong, and square types these purposes, and several will produce extrusions to the design of the architect on order.

SHEETS AND PANELS

Metal sheets and panels for use in flooring, ceiling, roofing, and siding applications, are considered at length in other sections of this issue. There are, however, a number of special types of sheets and panels which should be mentioned.

One manufacturer, for example, has devised an interlocking panel which forms floor, ceiling, and joists in one operation, also allowing space for large pipes and ducts, and providing convection surface to coordinate with radiant heating coils. The upper surface is primer painted, ready for flooring, and the lower surface may be left exposed for beam ceiling or may be covered with wire lath and plaster as desired. The same panels may be used vertically for partitions.

A number of manufacturers produce steel deck plates, some of which are designed to use either in forming floors or as steel forms for laying concrete floor slab. Some are also built with special acoustical properties. These all-steel panels and members have the advantages of low initial cost, flexibility in handling, ease
SPECIAL STEEL access panel to provide access to drainage pipe in basementless building. Installed with metal wall around area of panel.

TYPICAL attractive fireplace in home of modern design utilizing a metal fireplace unit with hot air grilles located in wall near ceiling and cold air return grilles in baseboard at either side of installation, and strength. Some types are also made of aluminum.

Corrugated roofing and siding is available in aluminum and galvanized sheet metal. Aluminum is non-rotting, light weight, easy to handle, provides long-term service.

Corrugated steel sheets offer the advantage of light weight with great strength and rigidity, and are used in the familiar round-type Quonset structure as well as in numerous all-steel storage and utility buildings erected with conventional square design and hung on metal framing members.

PACKAGE receivers are available in various trims and colors, made of insulated steel, with inner and outer doors.

LACLEDE JOISTS add STRENGTH plus Beauty to the new Charleston Memorial Hospital

Where lightweight strength, beauty... and functional design are vital—you'll find the answer in versatile Laclede Steel Joists. By specifying Laclede Joists for floor and roof construction you can speed completions and help conserve steel.

LACLEDE STEEL COMPANY
St. Louis, Mo.

APRIL 1957

SPECIAL DOORS

While most kinds of doors are discussed in full detail in the section on windows and doors, certain special purpose doors are normally manufactured as complete "package" units made of metal.
Now available in greater supply!

Duro-O-Wal... the patented steel reinforcing for every type of masonry wall... is being shipped on stepped-up schedules. This backbone of steel is economical, lasts fast prevents unsightly cracks. Trussed design incorporates architecture’s oldest reinforcing principle.

Cedar Rapids Block Company
Dur-O-Wal Div. 658-12 Ave SW
Cedar Rapids, Iowa

Dur-O-Wal Products, Inc.
P.O. Box 628
Syracuse 1, N.Y.

Access Doors

Access doors include roof hatches, ceiling hatches, floor hatches, and scuttles. Made of steel or aluminum, roof scuttles or hatches provide easily-installed, trouble-free access to the roof of the building. The only requirement is that a roof opening of the proper size be provided. The hatch is lined up over this opening and nailed or bolted to the rough roofing through holes provided in the flanges of the unit. They are watertight and fireproof and can be set up to lock from either inside or outside.

Heavy-duty compensating spring hinges are used in most types, and insulation is also built into the unit. Floor and ceiling hatches are made so that the door fits flush with floor or ceiling. Floor hatches in some instances have either smooth or patterned surface to prevent slipping.

Doors available include copper alloys, galvanized sheet metal, aluminum, bronze, and stainless steel. Some models have a locking feature to hold the door open so that it cannot slam shut, as well as rubber weatherstripping to prevent leaking of air or moisture. Flush steel panels are also available for installation into walls for ready access to concealed wall spaces, valves, traps, dampers.

Sidewalk Elevator and Pit Doors

Elevator doors are available in split-type for box strike elevators, or single-piece platform type for corner post elevators. Transformer vault and pit doors are made in standard sizes with single-leaf construction. Pit doors with channel-type frames keep dirt and dust off the floor below if used indoors.

Basement and Bulkhead Doors

Doors for use with either frame or masonry construction are available as package units which are attractive, designed for long life, and easy to

Home sanitation helps FIGHT POLIO

Majestic UNDERGROUND GARBAGE RECEIVER

The practical and profitable answer to home sanitation needs

Snug-fitting lid bans disease-spreading pests. Keeps garbage from sight and smell. No freeze, no ferment. 10-year guarantee on top and shell. Inner can outlasts exposed types 5 times.

The Majestic Co.
300-D Erie Street, Huntington, Indiana

Nationally Known and Advertised Building Products for Over 40 Years
STEEL cellar door and door frame units are sturdy, fire-resistant, easily installed and operated. Made in either copper-steel or aluminum and in various standard sizes.

STAIR railings provide fertile field for ornamentation with metal work in iron, bronze and other alloys.

Asphit and Cleanout Doors

Installed in the bottom of chimney or stack for easy removal of soot and ashes, asphit and cleanout doors in some instances are cast iron, but in most modern types are made of steel with welded parts and heavy-duty hinges to give long wear. Ornamental styles are available for use with fireplaces in homes without basements. Ash dumps and fireplace dampers are also available as stock units easy to install where provision is made for them in advance.

Chute Doors

Both foundation chutes and grade-line chutes for coal may be set up to utilize ready-made door units which accompany the chute. Mail chutes with suitable doors are also available for the builder who wishes to include them in his specifications. Many modern homes enjoy the convenience of a package-receiver, which is usually an insulated steel receptacle built into the wall with an outer and an inner door. Laundry chute doors are also available from stock from several manufacturers.

FIREPLACE UNITS

Old-fashioned fireplaces wasted heat, smokcd up rooms, and caused discomfort in various ways. For the builder who has a fireplace included in his plans, there are several fireplace heating units which are designed by engineers to provide added comfort and efficient fuel consumption.

While not recommended as a substitute for heating plants in northern climates, efficient fireplaces can save fuel bills by providing heat during many cool weather days. Units which circulate the heat to every part of the room or house through ducts are available in designs that permit their use with a wide range of ornamental fireplace types.

Firebox, throat, and flues are designed for correct operation, and dampers, down-draft shelves, and smoke domes are all built into correctly fabricated units.

Use of such units removes all guesswork from fireplace construction, as the only task remaining is to make provision for the unit selected in basic building planning, and build the ornamental-masonry or stone fireplace around the unit proper. Should it be desired to heat more than one room with the unit, it should be located against an inner wall with heat outlets opening into the other rooms. Outlets may be arranged above the

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100 Fireplace Ideas

Valuable help owners decide on the design and materials of their fireplaces.

It describes the Fyro-Place—an extraordinary heat-circulating form that eliminates troublesome mortar joints and provides the time and material-saving “Ductmakers”.

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Name ________________________
Address ______________________
City ________________________

PRICE FIREPLACE HEATER & TANK CORPORATION
195 West Austin Street, Buffalo 7, New York

Grille or louver for ceiling fan is a typical installation. Similar metal louvers are also popular in doors to control drafts and room ventilation.

Unit or at the side, through the top of the mantel, below the mantel, and with side outlets above or below the mantel. Units are also available for corner locations and for fireplaces designed with side and back enclosed with the other side and front open.

ORNAMENTAL METAL WORK

Ornamental metal work includes ornamental casings, wrought iron pieces, gates, canopies, fences, railings, brackets, grilles, window bars, hand rails, trellises, lamps, ornamental stairs and doors, and posts. Perhaps the most common material is cast iron, although many pieces are now made of aluminum and bronze. Lettering is available for use in smaller commercial buildings for signs, name plates, and similar purposes.

SHUTTERS AND LOUVRES, JALOUSIES

Modern door construction frequently utilizes jalousies or louvres, the primary purpose of which is to provide adequate ventilation in rooms, corridors, and closets. While jalousies or louvres are available with wood or glass slats, and one manufacturer at least is making glass jalousie-style windows, the greatest demand is for the metal jalousie unit for installation into doors. Made of furniture steel, aluminum, or other metals, and of almost any size, these units are shipped complete and ready for installation from several manufacturers.

Cut Building Costs!

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CHAN-L-CROS Metal Cross Bridging

Easy to Install

Chan-L-Cros is an advanced method of bridging wood joists that provides greater floor strength and cuts building costs. It reaches you ready for quick, easy installation—saves construction because it eliminates sawing and fitting of wood. This greatly reduces time and costs—increases the contractor’s profit.

Other Advantages That Make Chan-L-Cros Better

It distributes a concentrated load to adjacent points to prevent deflection of beams by the practical application of the principle of tension. It is flexible enough so that, when deflected, there is no weakening of the foundation. It requires no bracing or other provision for nailing meets requirements of all building codes—does not interfere with laying of flooring—cannot separate from joint when under load of 400 or lumber shingles.

Chan-L-Cros is available in sizes for 4, 8, and 12 inch joists, suitably finished to read wood. It is also recommended for construction of window sills.

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Write for full particulars

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4060 N. 100 St., Milwaukee 15, Wis.
PLYWOOD is an engineered panel material made up of three or more layers of veneers bonded together with glue, with the grain direction of each ply at right angles to that in the adjacent ply. An odd number of plies is nearly always used to obtain balanced construction. While plywood panels are produced in a wide range of both soft and hardwoods, over 90 percent of all plywood used in light construction is supplied by the Douglas fir plywood industry. Douglas fir plywood panels are produced under rigid performance standards and each carries a grade-mark for ready identification (see illustration page 220).

SHEATHING, SUBFLOORING, ROOF DECKING

Plyscord is the recommended grade of plywood for sheathing, subflooring and roof decking. Certain veneer defects not affecting its serviceability may appear on both surfaces. It has moisture resisting qualities.

Plyscord 1/8-inch thick is recommended for use as roof sheathing over rafters 16 inches on center under both wood and asphalt shingles. Wood shingles, however, must be applied with nailing strips unless 1/2-inch plywood is used. The rafters may be spaced 24 inches on center when 1/2-inch plywood is used.

The minimum thicknesses of Plyscord when used for wall sheathing are 1/8-inch for 16-inch stud spacing and 5/32-inch for 24-inch stud spacing. Corner braces in house framing may be eliminated when 4 by 8-foot sheets of plywood are nailed with 6d nails, 6 inches on center on all edges and 12 inches on center at intermediate bearings. When 1/8-inch plywood is applied as wall sheathing, wood shingles may be fastened directly with ring-barbed nails. If barbed nails are not used, nailing strips must be employed. Likewise, ring-barbed nails must be used for application of asbestos cement shingles or siding to 1/8-inch plywood wall sheathing.

One-half inch plywood is permitted as a base for wood finish and all composition types of flooring when the following application methods are followed: (a) joist spacing not more than 16 inches on center; (b) blocking installed under all panel edges at right angles to joists and (c) nailed securely 6 inches on center at all edges and 10 inches on center at intermediate framing members. Further, joist spacing may be increased to 20 inches if 5/32-inch plywood is used and to 24 inches if 1/4-inch plywood is used when requirements (b) and (c) above are followed. Lay panels with outer grain across the joists.

In all cases correct nailing techniques must be followed for fastening the plywood and other components of floors, walls, and roofs. For nailing 1/8-, 5/32- and 1/4-inch Plyscord, 6d common nails should be used. The 5/32-inch Plyscord should be fastened with 8d common nails. Nails should be spaced not more than six inches apart at the edges of panels and not more than 12 inches apart on other bearings when plywood is used for sheathing or subflooring.

In applying Plyscord, especially on the roof, the edges should be protected.

(Continued on page 220)
for the Building men of America

a new quality Douglas fir hardboard to help you save money...save time...save material. ALLWOOD hardboard...amazingly tough...amazingly versatile...challenging comparison as a new leader in quality hardboard. Produced in the mountain forests of Oregon in a plant designed for maximum efficiency and positive quality control. Get all the facts on this new ALLWOOD hardboard. Distributed nationally by SIMPSON LOGGING COMPANY, Seattle, Washington.

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NOW—To the already large family of Simpson quality forest products, we add HARDBOARD. This new product is available through better retail lumber dealers.

Simpson Allwood Hardboard is manufactured of Douglas fir fibers under rigid manufacturing controls to assure uniform quality. The line is complete—in thicknesses, sizes and types—and meets the demands and requirements of architects, builders, commercial users, farmers and home owners.

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- Tempered Hardboard
- Hardlite (lighter density)
- Underlayment
- Wall Tile

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Please send me sample and further information about SIMPSON ALLWOOD HARDBOARD.

Firm name __________________________
Address __________________________
City __________________________ Zone ______ State ______

Attention of __________________________
The industry grade trademarks shown assure the user that the panels are genuine Douglas fir plywood manufactured in strict accordance with U. S. Commercial Standard CS45-48.

FOR EXTERIORS

For exterior use, only the exterior grades of plywood, with waterproof adhesive bonding, should be applied. Plyshield is specifically produced for use as siding; one face is sound veneer and ready for any type of finishing.

The minimum thickness of plywood recommended for siding is \( \frac{5}{8} \) inch, although, for economy in some types of construction, \( \frac{1}{4} \) inch panels are used successfully. For construction of single-wall structures, such as warehouses, \( \frac{5}{8} \)-inch or thicker Plyshield siding has been used with success and economy.

Exterior plywood siding should be applied with non-corrosive nails. The common, hot-dipped galvanized type is satisfactory. Nailing should be with 6d common or with 6d box nails for \( \frac{3}{8} \)-inch siding and 8d for thicker siding. When full-size 4 by 8-foot or longer panels are used, fastenings should be spaced not more than 6 inches on center at panel edges and 12 inches elsewhere. When narrow 12- to 24-inch panels are installed as lap siding, nailing at panel ends should be not more than 4 inches on centers.

In applying exterior plywood for siding there are several simple and easily adapted methods for handling joints between the panels. Some suggested treatments for both horizontal and vertical joints as well as water table details are shown on these pages.

All edges of plywood siding, no matter whether butt, vee, covered, or exposed, should be bedded in a thick lead and oil paste or other suitable compound. This is knifed on as the panels are applied. Filler or bedding specifications are: 100 pounds of paste white lead, one and three-quarters gallons of raw linseed oil and one pint of dryer. Reduce dryer to one-half pint if boiled linseed oil is used.

If plywood is installed as lapped siding, the lap should be at least two inches and bedded in paste. The vertical joint should be backed with narrow strips of wood shingles tacked
Why EXTERIOR Weldtex
is your best bet for all exterior applications

WON'T CHECK
WON'T CRACK
WON'T SHOW GRAIN RISE
STAYS BEAUTIFUL FOREVER!

and now available in REDWOOD!

Exterior Weldtex® is the most beautiful and practical exterior plywood panel ever developed.

Right at home on the finest custom-designed dwellings and commercial buildings, Exterior Weldtex is also a natural for moderately-priced houses...gives them a richer, more luxurious look at no extra cost!

Exterior Weldtex has the warmth and beauty that only natural wood can provide...with deep, irregularly-cut striations that add a crisp, interesting shadow-line. Furthermore, these striations prevent checking and grain raising...and hide nail holes and joints.

In addition to standard Douglas Fir Weldtex, we now offer REDWOOD Weldtex. This new paneling adds the known weather resistance and beauty of redwood to the many Weldtex features.

Exterior Weldtex takes paint or stain perfectly and is approved by F.H.A. for Federal Housing jobs.

It comes in large, easily-installed panels 4'x8', 4'x9' and 4'x10'...as well as pre-cut Douglas Fir Weldtex Siding, 48"x15?/8", packed 22 panels in a bundle.

Weldtex for Interiors

Interior Weldtex Panels lend themselves to unusual decorative treatments—horizontal, vertical, checkerboard, etc. They come in Douglas Fir, Southern Gum, Philippine Mahogany and California Pine, in sizes: 4'x6', 4'x7', 4'x8' (also 4'x9' and 4'x10' in Fir only).

And don't forget the 12", 16" and 24" Weldtex Squares of Southern Gum—the newest way to use this decorative plywood.

You and your workmen will like to work with Weldtex...your customers will be delighted with it. Order today from your Weldwood supplier.

In ordering or specifying Weldtex, please be sure to indicate either Interior or Exterior Grade, the latter bonded with waterproof resin adhesives and guaranteed against delamination.

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Manufactured and distributed by
UNITED STATES PLYWOOD CORPORATION
Largest Plywood Organization in the World
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and U. S.-MENGEL PLYWOODS, INC.
Louisville 1, Ky.
Branches in Principal Cities • Distributing Units in Chief Trading Areas
Dealers Everywhere
to the studs. The vertical butt joints may also be flashed by a strip of asphalt-impregnated building paper tacked over the shingle and lapped just over the course below. Horizontal edges of plywood used as lapped siding should be beveled slightly so water will drip from the outside edge.

**FOR INTERIORS**

Plypanel is the grade of fir plywood designed for finishing walls, ceilings, partitions, storage walls, cabinets, and built-in furniture where only one surface is to be exposed.

Thicknesses most popular for wall paneling are the 3/8-inch and 1/2-inch panels, while the 5/8- and 3/4-inch thicknesses have widespread use in cabinets, built-ins and doors.

For good wall construction, Plypanels 3/8-inch thick are recommended over studs 16 inches on center. Apply panels either vertically or horizontally; the latter affords extra rigidity.

Some building codes require a 2 by 4-inch fire stop about four feet from the floor between studs. This horizontal member serves as backing for plywood panels and is recommended.

Plywood panels 3/4-inch thick are fastened with 6d finish or casing nails spaced 6 inches on center and 1/2-inch panels are applied with 4d finish nails.

Joints between plywood panels pose no problem under ordinary conditions. In fact, frank recognition of the joints as such can add much to the architectural effect. Panel edges may be butted flush, V-grooved, covered with decorative moldings or have inset moldings.

A basic principle in applying plywood paneling is to start at openings with vertical joints and divide plain wall spaces in any preferred, orderly arrangement. Often moldings are applied to obtain horizontal stream-lined effects or a variety of paneled designs. V-grooves, easily made with portable electric routers, can be effectively employed to simulate narrower paneling or to make designs on the panel face. Lapping of panels is particularly effective in ceilings.

Use furring strips when applying plywood over an already plastered wall.

Interior finishing with plywood permits curved surfaces where they are desired. In many commercial installations this is an advantage because fixtures may also be made of plywood to harmonize with walls and ceilings. In developing curved surfaces with plywood, it is often desirable to install the panel to be bent first, and then to fit the flat surfaces. In a varying radius, the sharpest

**ABOVE** are three basic interior plywood wall paneling design suggestions. The best rule to follow is to start paneling at the openings with vertical joints and then divide the plain wall space in an orderly pattern with panels placed in reasonably balanced horizontal or vertical spaces. Where the width of the wall is 10 feet or less, panels may be run horizontally in two or three pieces with the openings cut out. Place vertical joints at each side of the top of door and at top and bottom of window openings. If the width of door or window opening is more than four feet, most designers do not hesitate to place panels horizontally. Combinations of vertical and horizontal arrangements may be used in the same room with pleasing effect.

Panels in 9- and 10-foot lengths are available to help solve special paneling problems. Joints between panels constitute no problem since they can be butted, veed, covered with molding, or handled in any one of the many ways illustrated at right below. Recognition of the joints as such adds to architectural effect.
As one of the oldest and largest producers in the industry, Associated makes a type, size and grade of Douglas fir plywood for every building need:

*Interior-type:* For walls, ceilings, cabinets, built-ins; for sheathing and subflooring.

*Exterior-type:* For siding, outdoor signs, farm structures, boats of all sizes and shapes.

*Sea Swirl* (interior and exterior). A beautiful decorative plywood for remodeling and new construction.

*Plastic surfaced plywood* (exterior-type): For concrete forms, siding for commercial and industrial buildings.

*Plyron* (interior and exterior). Plywood core between hardboard surfaces. For all types of construction; built-ins, furniture.

All APMI plywood is manufactured in the heart of the Douglas fir region of Oregon; is grademarked and trademarked; is available through branch sales warehouses in major building cities, sold by experienced plywood men. Your inquiries are invited.
curve should be made and secured first. Use of continuous rounded backing, such as hand-sawn framing, contributes to a better job and reduces the risk of rupturing the plywood.

For critical bends it is sometimes advisable to use two layers of thin panels. In using plywood for short radii, it may be soaked in hot water until warmed through. When this is done, only exterior type plywood should be used, and even then it is done at a greater risk of rupture, possible checking, and grain raising.

Bends are made more readily across the grain. Saw kerfing on the concave side of a curve at regular intervals to a depth of about one-half the panel thickness helps materially. For severe bends, panels should be carefully selected for straight grain.

Flush joints for unbroken walls to be textured may be formed successfully with the tape joint procedure. Merely butt the panel edges and fill any openings with Spackle of Swedish putty. Over the joint, a perforated paper wall tape or gauze is imbedded in joint filler compound; when dry, a second layer of filler is applied and

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**APPROXIMATE MINIMUM BENDING RADII**

**For Douglas Fir Plywood**

<table>
<thead>
<tr>
<th>PANEL THICKNESS</th>
<th>APPROXIMATE MINIMUM RADIUS ACROSS GRAIN</th>
<th>APPROXIMATE MINIMUM RADIUS PARALLEL TO GRAIN</th>
</tr>
</thead>
</table>
| 1/4 Inch        | 6
| 1/2 Inch        | 12
| 3/4 Inch        | 18
| 1 Inch          | 24
| 1 1/2 Inches    | 36
| 2 Feet          | 48
| 3 Feet          | 60
| 4 Feet          | 72
| 5 Feet          | 84
| 6 Feet          | 96
| 8 Feet          | 120

**TYPICAL DOUGLAS FIR PLYWOOD THICKNESSES FOR FARM SERVICE BUILDINGS**

**FOR WOOD SERVICE BUILDINGS**

<table>
<thead>
<tr>
<th>Plywood Joint</th>
<th>Plywood Stud Spacing</th>
<th>Plywood Rafter Spacing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grain Bins</td>
<td>1/4&quot;</td>
<td>1/4&quot;</td>
</tr>
<tr>
<td>Round</td>
<td>1/2&quot;</td>
<td>1/2&quot;</td>
</tr>
<tr>
<td>Rectangular</td>
<td>3/4&quot;</td>
<td>3/4&quot;</td>
</tr>
<tr>
<td>Corn Cribs</td>
<td>1&quot;</td>
<td>1&quot;</td>
</tr>
<tr>
<td>Silos</td>
<td>1 1/2&quot;</td>
<td>1 1/2&quot;</td>
</tr>
<tr>
<td>Lining</td>
<td>2&quot;</td>
<td>2&quot;</td>
</tr>
<tr>
<td>Horse Barn</td>
<td>3&quot;</td>
<td>3&quot;</td>
</tr>
<tr>
<td>Stall Partitions</td>
<td>4&quot;</td>
<td>4&quot;</td>
</tr>
<tr>
<td>Horse Trailers</td>
<td>5&quot;</td>
<td>5&quot;</td>
</tr>
<tr>
<td>Calf Barn</td>
<td>6&quot;</td>
<td>6&quot;</td>
</tr>
<tr>
<td>Partitions</td>
<td>7&quot;</td>
<td>7&quot;</td>
</tr>
<tr>
<td>Loafing Barn</td>
<td>8&quot;</td>
<td>8&quot;</td>
</tr>
<tr>
<td>Milking Barn</td>
<td>9&quot;</td>
<td>9&quot;</td>
</tr>
<tr>
<td>Milk House</td>
<td>10&quot;</td>
<td>10&quot;</td>
</tr>
<tr>
<td>Hog Farrowing House</td>
<td>12&quot;</td>
<td>12&quot;</td>
</tr>
<tr>
<td>Portable House</td>
<td>14&quot;</td>
<td>14&quot;</td>
</tr>
<tr>
<td>Wallowing Trough</td>
<td>16&quot;</td>
<td>16&quot;</td>
</tr>
<tr>
<td>Feeder</td>
<td>18&quot;</td>
<td>18&quot;</td>
</tr>
<tr>
<td>Pig and Lamb Brooders</td>
<td>20&quot;</td>
<td>20&quot;</td>
</tr>
<tr>
<td>Poultry House</td>
<td>22&quot;</td>
<td>22&quot;</td>
</tr>
<tr>
<td>Portable Brooders</td>
<td>24&quot;</td>
<td>24&quot;</td>
</tr>
<tr>
<td>Watering Tank and Trough</td>
<td>26&quot;</td>
<td>26&quot;</td>
</tr>
<tr>
<td>Tobacco Curing Barn</td>
<td>28&quot;</td>
<td>28&quot;</td>
</tr>
<tr>
<td>Fruit and Vegetable Storage</td>
<td>30&quot;</td>
<td>30&quot;</td>
</tr>
<tr>
<td>Fumigation Chamber</td>
<td>32&quot;</td>
<td>32&quot;</td>
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<tr>
<td>Refrigerators and Freezers</td>
<td>34&quot;</td>
<td>34&quot;</td>
</tr>
<tr>
<td>Machine Sheds</td>
<td>36&quot;</td>
<td>36&quot;</td>
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<tr>
<td>Septic Tank Forms</td>
<td>38&quot;</td>
<td>38&quot;</td>
</tr>
<tr>
<td>Chutes and Air Ducts</td>
<td>40&quot;</td>
<td>40&quot;</td>
</tr>
<tr>
<td>Doors</td>
<td>42&quot;</td>
<td>42&quot;</td>
</tr>
</tbody>
</table>

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**LETTER JOINT RUTTED**

**WEDGE MATERIALS**

| WHEN JOINTS are recognized as such and made a part of the architectural design they are usually easier to treat. Above are shown eight popular treatments for plywood siding joints

SUGGESTED joint treatments for interior plywood walls. Wood or metal mouldings may be utilized

feathered out several inches on each side. The joint is sanded smooth before painting or papering. For greatest joint smoothness, panel edges which are to be joined may be beveled slightly, starting two or three inches from the edge, before installation. Other methods of obtaining flush joints include glued strips at panel edges or the gluing of plywood to furring strips nailed to the framework.

(Continued on page 228)
PLYPANEL: for a wide range of installations where appearance counts. When manufactured with waterproof glue it is known as PLYSHIELD and can be used for all exterior applications.

PLYSCORD SHEATHING: for walls, roofs, subflooring, Available in interior and exterior types.

PLYFORM: for constant use and re-use for concrete forms — sanded both sides — mill-oiled and edge sealed at the factory.

EXTERIOR GRADE FIR PLYWOOD: made with completely waterproof phenolic resin adhesives. For siding, liners, barns, silos, and a wide range of other exterior applications.

BIRCH MAHOGANY BLONDE LIMBA

MAPLE PRIMA VERA AVODIRE

OAK WALNUT KNOTTY PINE

GUM CHEN CHEN VERTICAL GRAIN FIR

These are top quality plywoods — all materials are carefully processed — bonded with the best adhesives in hot plate presses — sanded to satin smoothness—and carefully stored under proper conditions. You can sell Roddiscraft quality with confidence.

AVAILABLE WHEN YOU WANT IT: A nation-wide warehouse service makes delivery of Roddiscraft Plywood fast and reliable. For complete information — sizes, thickness — prices — and prompt service get in touch with your nearest Roddiscraft dealer.

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PANEL DISCUSSION

FHA Accepts ¥% Plywood Over Rafters 24° O. C.

On the basis of recent tests and experience data, Federal Housing Administration now accepts plywood ¥% thick as roof decking over rafters spaced 24° on centers, according to a letter from Curt Mack, assistant commissioner of the FHA underwriting office, to Douglas Fir Plywood Association.

A revision of FHA Minimum Property Requirements is planned; meanwhile, FHA at Washington (Underwriting Office) will advise any insuring office upon inquiry that ¥% plywood over rafters 24° on centers will be accepted. Plywood roof deck thicknesses now accepted by FHA are shown below in tabular form.

<table>
<thead>
<tr>
<th>Roofing Material</th>
<th>Max. Rafter Spacing</th>
<th>Min. Plywood Thickness</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wood, Asphalt</td>
<td>24°</td>
<td>¥%</td>
</tr>
<tr>
<td>Shingles</td>
<td>24°</td>
<td>¥%</td>
</tr>
<tr>
<td>Slate, Tile,</td>
<td>20°</td>
<td>¥%</td>
</tr>
<tr>
<td>Asbestos-Cement</td>
<td>24°</td>
<td>¥%</td>
</tr>
<tr>
<td>Flat Roofs</td>
<td>24°</td>
<td>¥%</td>
</tr>
</tbody>
</table>

*Under wood shingles; if plywood is less than ¥% thick, apply 1" x 2" nailing strips.

A folder giving information regarding use and acceptance of fir plywood in homes built under FHA financing may be had free of charge from Douglas Fir Plywood Association, Tacoma 2, Wash.

Plywood Builds Band Shell

The problem was to design a symphonic band shell for the University of Virginia that would be, as nearly as possible, acoustically perfect, light and easily erected, yet amply strong and rigid. To meet these requirements, Architect Floyd E. Johnson, Charlottesville, Va., chose Exterior fir plywood framed with lumber, fir and light steel bow string trusses.

Floor of the structure is ¥% Exterior plywood, supported by 2x10 joists over 4x10s.

---

Beauty, Adaptability, Economy—Get All 3 With Plywood Siding*

Of all siding materials, Exterior plywood is the most adaptable to various design treatments. It can be used to create board and batten siding... flush surface... or cut in third or half panel widths and applied as extra-wide lapped siding. It can be used in combination with other materials such as brick or masonry to achieve interesting texture contrasts.

And of all quality siding materials, Exterior plywood is least expensive. Least expensive in two ways: first, Exterior plywood actually costs the same or less per square foot than other quality materials; second, plywood’s large size and easy workability speed work, cut labor and application time and costs up to one-third.

Exterior plywood siding is durable, too. It won’t shatter, split, or puncture. And the completely waterproof adhesives used between plys are more durable than the wood itself!

*PlyShield® is the siding grade of waterproof-bond Exterior-type plywood. One side is of highest appearance; for economy, limited defects are permitted in back. For use as siding, gable ends, etc. Other Exterior grades with 2 faces of highest appearance are available for single wall partitions, fences, etc.
number. Wall sections are wood framed on all four sides by 2x6 framing members. Wall and ceiling panels are bolted together. Self-opening plywood blow panels, 4'x4', relieve air pressure. Acoustical qualities of the shell have been favorably commented upon by performers and audience alike.

**Plywood Catalog Available**

The 1952 Basic Plywood Construction Catalog, a reprint of the 20-page insert for Sweets File, Architectural, is now available free of charge to architects, engineers, builders and dealers. It contains plywood grade-use data, finishing information, suggested details and plywood construction techniques. Order from Douglas Fir Plywood Association, Tacoma 2, Washington.

**Garden-Room Addition Uses Single Wall Construction**

Faced with the problem of creating extra living-space to accommodate the needs of his growing family, Architect Whitney R. Smith combined Douglas fir plywood, plate glass and considerable skill to add this large multi-purpose garden-living room to his Los Angeles country home. Situated in an April-like garden planted 40 years ago, the striking plywood addition creates an intimate link between indoors and out. Physically, this is accomplished by having the floor of the room at the same level as the garden which surrounds the room on four sides. Visually, the slender supports combine with high ceiling windows to permit a smooth, unbroken flow of plywood ceiling paneling outward into the broad plywood soffits.

Architect Smith used a single thickness of 3/8" Exterior plywood secured to the inside of 4"x4" posts, 4' o.c. Interior ceiling paneling is 3/8" Interior plywood; soffits are 3/4" Exterior. Both interior and exterior walls are painted a pleasing grey-green; ceiling and soffit are light-stained.

**Plywood Built-Ins Often Mean The Difference Between FOR SALE and **

No doubt about it, plywood built-ins have buy-appeal. Space-thrifty plywood storage wall, built-in dining bar or crisp kitchen cabinets can often mean the difference between a house that's snapped up the minute it's offered and one that's a drug on the market—an important fact to consider as selling becomes more and more competitive.

And it's so easy to add client and customer-winning distinction to your homes with plywood built-ins. For no other material is so adaptable to specific design and space requirements. With plywood, you can make the built-in fit the house—exactly. No bothersome juggling of "stock size" units. No limit to size, design, finish or color. Plywood works quickly, easily with ordinary tools. It is equally adaptable for construction of shop-fabricated units. Plywood won't split, chip or puncture. It's the logical material for every built-in.

**Douglas Fir Plywood**

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Portfolio of Prize-Winning Built-Ins. Valuable collection of designs that will serve as a springboard for your own imagination. Contains over 50 designs judged best in the national "Better Living Home" architectural contest. For your free copy write Douglas Fir Plywood Association, Tacoma 2, Washington.
HARDWOOD PLYWOOD

The application measure set down for fir plywood can generally be followed for hardwood plywood used on interiors with a few additional cautions. To achieve the best results, furring strips of 1/2-inch plywood, cut two inches wide with the grain running the short way, should be nailed to the studs and blocking. By use of the furring strips, individual panels are practically united into a single unit of wall which swelling or shrinking of the building will not affect.

CONCRETE FORMS

Two standard grades of fir plywood are especially produced for concrete form use: (1) Plyform, for multiple re-use, made with highly water-resistant but not waterproof adhesives; (2) exterior-type fir plywood, grade-marked EXT-DFPA-Concrete Form, with a completely waterproof bond between the plies. Plastic-surfaced plywood is available for constructions requiring the best possible appearance of the concrete surface.

The thickness of plywood to use in concrete forms depends on the loads, permissible deflection, and spacing of studs, joists or stiffeners. The 3/4-inch and 5/8-inch are the most popular thicknesses. It is axiomatic that the supporting framework, studs, walls, posts and joints must be constructed for deflection, bending strength and shear in studs and joints and for column action in posts. Plywood requires proper support from studs or joists. The height and rate of pour as well as fluidity affect pressures against the forms and spacing of supports. Values are calculated on panels placed with face grain across the studs:

<table>
<thead>
<tr>
<th>Thickness</th>
<th>Spacing</th>
<th>Limiting Deflection</th>
<th>Maximum Load</th>
</tr>
</thead>
<tbody>
<tr>
<td>3/8&quot;</td>
<td>12&quot;</td>
<td>1/270 of Span</td>
<td>880 lbs. sq. ft.</td>
</tr>
<tr>
<td>1/2&quot;</td>
<td>12&quot;</td>
<td>1/270 of Span</td>
<td>1,100 lbs. sq. ft.</td>
</tr>
<tr>
<td>5/8&quot;</td>
<td>16&quot;</td>
<td>1/270 of Span</td>
<td>1,100 lbs. sq. ft.</td>
</tr>
<tr>
<td>3/4&quot;</td>
<td>12&quot;</td>
<td>1/360 of Span</td>
<td>1,000 lbs. sq. ft.</td>
</tr>
<tr>
<td>5/8&quot;</td>
<td>16&quot;</td>
<td>1/360 of Span</td>
<td>420 lbs. sq. ft.</td>
</tr>
</tbody>
</table>

In building up concrete form panels, a simple jig for ready spacing of studs and stiffeners is a great time- and labor-saver.

Nails for forms should be as small and as few as practicable. For nailing plywood to studs, use nothing larger than a 5d nail in panels up to 3/4-inch-thick and 6d nails for 3/8-inch panels. Lining plywood, 3/8-inch-thick, is applied with 2d nails. When panels lap at corners and, in fact, wherever possible in assembling forms, the use of double-headed nails will facilitate stripping and minimize destruction of lumber.

Plyform panels are edge-sealed at the mill and also are oiled unless otherwise specified. Some builders are having success with special lacquer as a first coat instead of oil. This gives better protection to the plywood and results in a smoother wall. If this system is used, the plywood should be ordered from the mill "not oiled." Where oil is used all panels should receive a uniform coating of a good grade of form oil before each pouring. Too much oil will stain the concrete. A thin film that makes the surface feel greasy to the touch is sufficient. All saw cuts or other markings should be treated with lead and oil, aluminum primer, shellac, or similar material as the job progresses. Any open cracks in joints should be pointed up or calked with lead, putty or plaster-of-Paris filler. The calked joints, after drying, should be care-
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MASONITE CORPORATION
DEPT. AB-4, BOX 777, CHICAGO 99, ILL.

APRIL 1952
ON panels for high walls, the selection of an efficient tie between form walls is important. This detail illustrates a practical tie known as a "She-Bolt," suitable for use in most structural concrete work. For architectural concrete and smooth surfaces, all joints in forms should be pointed with water putty, patching plaster, or a mixture of equal parts of tallow and Portland cement.

For sharply curved concrete surfaces, a radius of not less than 15 inches. 3/8-inch plywood panels make form construction easy. For minimum radius, plywood is bent across the grain. For moderate curves thicker Plyform may be used. The 3/8-inch panels may be bent to an 8-foot radius crosswise or 10-foot lengthwise.

No metal wedges or tools should be placed against freshly set concrete to pry the forms loose. If wedges are necessary, they should be of wood. The wedging should be done carefully by degrees with light rapping on the strip to break adhesion.

After stripping, the panels should be immediately and thoroughly cleaned of any concrete particles. A wide blunt blade should be used for this purpose. Projecting nails should be drawn to prevent scoring panels in stacking the sections. If the sections are to be completely dismantled, the plywood panels should be stacked evenly on a dry and level platform and protected from the sun and rain.

| TWO suggested treatments for joining plywood at interior paneling corners |

## PLYWOOD ON THE FARM

Because plywood used in farm service structures is constantly or repeatedly exposed to weather, to wetting during cleaning, or to high humidities (as in dairy barns), the exterior grades with waterproof adhesive bond should be used.

Plywood is especially valuable for use in portable farm buildings such as poultry brooder houses, hog houses, turkey-shelters, and range sheds. The portability factor is of prime importance. By using recommended grades and thicknesses of plywood for such structures, weight can be reduced as much as one-half and their useful life extended immeasurably. Plans may be obtained from Builders and dealers either through their own state agricultural institutions or from the Douglas Fir Plywood Association.

### HARDBOARDS

#### Types and Uses

Hardboards are panels processed from ligno-cellulose fibers which are the result of exploding wood chips under high-pressure steam. The fibers are then compressed into the desired panel thickness and density in thermal hydraulic presses. A quick reference chart shown on these pages gives the physical properties and panel sizes available for the seven basic types of structural and surface-finishing hardboards.

Hardboard is known as "the wonder wood of 1,000 uses." It is extensively used as a material for modernizing commercial interiors and exteriors, for cabinets and other built-in features in houses, and for level siding in home building. It is flexible and can be applied in curved designs. The surface is hard and resistant to dents and wear, and is an excellent base for any kind of finish.

#### Preliminary Conditioning

All hardboards should be presoaked before application. When using tempered hardboard for interior use the panels should be pre-expanded by applying cold water to the reverse (screen) side, at the same time scrubbing with a broom or brush. No water should be left standing on the%

### TABLE showing minimum bending radii for hardboards by thickness and type

<table>
<thead>
<tr>
<th>MINIMUM BENDING RADI</th>
<th>Heated Equipment Heated to 300°-450°F</th>
<th>Cold Moist Bends</th>
<th>Cold Dry Bends</th>
</tr>
</thead>
<tbody>
<tr>
<td>Standard Hardboard</td>
<td>1/8&quot;</td>
<td>2 1/2&quot;</td>
<td>2&quot;</td>
</tr>
<tr>
<td>3/16&quot;</td>
<td>5/16&quot;</td>
<td>3 1/2&quot;</td>
<td>2 1/2&quot;</td>
</tr>
<tr>
<td>1/4&quot;</td>
<td>5/32&quot;</td>
<td>3 1/4&quot;</td>
<td>4&quot;</td>
</tr>
<tr>
<td>5/32&quot;</td>
<td>5/16&quot;</td>
<td>5/32&quot;</td>
<td>5&quot;</td>
</tr>
<tr>
<td>Tempered Hardboard</td>
<td>1/8&quot;</td>
<td>1/4&quot;</td>
<td>2 1/2&quot;</td>
</tr>
<tr>
<td>3/16&quot;</td>
<td>1/4&quot;</td>
<td>3&quot;</td>
<td>2 1/2&quot;</td>
</tr>
<tr>
<td>1/4&quot;</td>
<td>5/32&quot;</td>
<td>3&quot;</td>
<td>4&quot;</td>
</tr>
<tr>
<td>5/32&quot;</td>
<td>5/16&quot;</td>
<td>5&quot;</td>
<td>5&quot;</td>
</tr>
</tbody>
</table>

**TABLE** showing minimum bending radii for hardboards by thickness and type

**SUGGESTED joint treatments for hardboard interior paneling. A slight space between panels is recommended**
The quality of Harbor products goes far beyond accepted standards. Result: 1—greater repeat business for dealers who feature Harbor products; 2—better jobs for the dealer who features Harbor products; 3—better value for the ultimate consumer. Check with any Harbor dealer or user. You'll find they agree: Harbor does turn out extra-quality materials, made better to serve better.
smooth surface or boards will not retain their original color. After the surface has turned a dark brown color, stack screen side to screen side and allow the board to stand for 12 to 16 hours. Then apply in this damp condition.

When using tempered hardboard for exterior finish, follow the same pre-expansion process as above, but let the board stand for 24 hours before applying.

Hardboards with tile face or leather finish have a lower rate of water absorption. To pre-expand such hardboards, it is necessary to stack, screen side to screen side, with wet cloths or newspapers between the panels, and allow to stand for 12 to 16 hours. Cover stacks to reduce evaporation.

**Working with Hardboards**

Use typical woodworking procedures and ordinary carpenter's tools when building with hardboards. Panels can be sawed, planed, routed, drilled, punched, shaped or bent into simple curves. Just observe these three "don'ts": Don't toenail; don't drive nails in the edges; don't nail moulting, etc., onto hardboards without any backing, for the hardboard will not hold the shank firmly.

The cross-cut saw with 8 to 12 points per inch and a No. 6 set should be used for straight cutting. Pressure should be little more than the weight of the saw. Power saws save time and may be used. Use a coping or compass saw for cutting irregular, curved and inside edges. Turn the intended exposed surface up when cutting. This procedure will leave a sharper corner on the face edge in addition to helping protect the face-side of the panel.

Beveled or rounded corners leave an attractive edge treatment and are easily obtained by using an ordinary plane or beveling plane. Keep the blade setting consistent for an edge treatment with continuity of even depth and angle.

Holes should be drilled if screws are to be used as fastenings. Counterbore holes if the screw head is to be flush or below the surface. For circular holes, a twist drill will work more satisfactorily than an auger bit.

For concealed nail heads, use finishing or casing nails and set with a nail set. Then fill with putty or plastic wood, over the head, after the prime coat of paint has been applied.

**Making Bends**

Hardboards can be bent into simple curves by the cold dry, cold moist, or the hot method. The method used depends upon the radius of the curve desired. (See bending radii chart.)

The cold dry method consists of bending the panel around the permanent back form or frame with no special preparation. Always start nailing from one end of the panel and continue to attach the panel as it is bent around supporting members.
Hammer,  
Hammer,  
Saw and  
Paint...  
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WORKMAN is shown applying adhesive to a panel of hardboard ready for installation in bathroom.

Never nail center portion of panel first.

For cold moist bends, submerge portion to be bent in water not exceeding 100 degrees Fahrenheit for 40 minutes to several hours. If natural finish is to be retained, scrub screen surface with water, stack panels with moist cloths in contact with screen sides only, cover with tarpskin and let standard hardboard stand for 24 hours; let tempered hardboard stand for 48 hours. Tile-face and feather-finish hardboard should stand for 72 hours. Then attach in usual manner.

For hot bends, panels are to be moistened in the same manner as described above and then bent over a pipe or roll heated to a constant temperature of 300 to 450 degrees Fahr-

That’s it!
I’ll look it up in my
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Catalog-Directory
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79 W. Monroe St. Chicago 3, Ill.

Installing Hardboards

Hardboards may be applied over solid backing such as wood, gypsum bath, gypsum wallboard and plaster, or directly to studs or furring strips not more than 16 inches on center.

Solid, continuous support must be maintained behind both horizontal and vertical joints. When applying directly over studs, hardboards should be at least 3/8-inch thick.

When hardboards are to be attached to solid surfaces the panels should first be cut to fit loosely in position on the area to be covered. Never fit panels tightly abutting each other. Then, by using a saw tooth trowel with notches of approximately 3/4-inch depth, spread waterproof adhesive over the entire back of the panel. Spread on all edges. Be careful not to get it on the surface which is to be exposed.

Place panel in position immediately after adhesive is applied. Press and tap it to get a firm contact over the entire area. It is then desirable to place braces or supports against the panel to hold it in place. (See diagram.) Time required to set is usually overnight. Nails may be used in place of shoring if base surface permits firm anchorage.

Nailing

Nails or screws should be used if panels are applied directly to studs. Nails should be long enough to penetrate the nailing base at least one inch. For interior work, space the nails six inches apart in the central areas of the panel and four inches apart approximately 1/4-inch from the edges. For exterior application space the nails somewhat closer together. Always nail center of panel before the edges. On exterior work use copper-coated, galvanized, or cadmium-plated casing head nails.

Lap Siding

Hardboards may be applied as lap siding in strips 8, 12 or 16 inches wide, of either 1/4- or 1/8-inch thickness. Apply directly over sheathing and building paper, using a 2-inch lap. For applying on the exterior of a masonry structure, wood furring strips spaced 12 to 16 inches on center should be used. Shim furring strips to a true plane level. Fill the space between furring strips with cement plaster flush with surface of furring that is set. Allowance should be made for a slight spring back. Panel moisture is converted to steam and when bend is completed panel will be dry.

A SUGGESTED method to brace interior hardboard panels until adhesive has set. Panels should be left braced from six hours to over-night.

Strips. A coat of asphalt mastic should then be applied to the reverse side of the panel before application. Then follow usual frame construction application directions.

The final surfaces of all hardboard applications should have the rough edges or irregularities dressed down with No. 00 sandpaper. Surface finishes for preservative or decorative effects may be applied by the same application techniques as used on the average hardboard. Practically any type of finishing material may be used.

Concrete Form Hardboards

Specially tempered hardboards are for concrete form use and should be pre-expanded before being applied to the framework of a concrete form. Scrub water into the screen side and then stack screen side to screen side, covered, and let stand for 24 hours. Panels are then applied to the form construction in the moist condition with the smooth side against the concrete and nailed securely. Screen side of panel may be used against the concrete if rubbing is required to produce a uniform surface color on concrete.

Necessary bevels can be formed of smooth, straight-grained wood and nailed through the fiber board and into the backing. Before first use or re-use the panel surface which bears against the concrete should be wiped with waste saturated with grease having a calcium soap or aluminum stearate base, or with waste dipped in paraffin base oil having a viscosity of not less than 250 seconds at 100 degrees Fahrenheit (Saybolt) and free from volatile constituents.

All other basic principles of proper concrete form fabrication should be followed.
Terne, or more accurately terne plate, is the correct name for the material often called “roofer’s tin.” The old name persists, even though a plating of tin alone has not been used for roofing for more than a century.

Modern terne plate consists of copper-bearing steel strip, cold reduced to the proper thickness, heat treated to provide the best balance between malleability and toughness, and hot-dipped to give it a heavy coating of terne metal—an alloy of lead and tin. The lead provides protection against the weather, and the tin bonds the alloys to the steel base with greater adherence than is possible with lead alone.

Follansbee Steel Corporation has been making the highest quality Terne Metal for more than half a century. First, as “box ternes” — hand-dipped rectangular sheets 14” x 20’ and 20” x 28’— which were seamed and soldered together when they were laid. Later, we offered “long roofing ternes”— sheets 8 feet long—then originated the exclusive Follansbee 50-foot seamless roll.

Its durability, malleability and toughness make terne the ideal weathersealing material. It is used for valleys, gutters, flashings, etc., on built-up composition, asphalt or asbestos shingle, slate and tile roofs. A wide range of widths—4”, 6”, 7”, 8”, 10”, 12”, 14”, 20”, 24” and 28”—is provided for any weathersealing need.

Weatherseal strips of Terne Metal may be painted immediately after installation. Terne is supplied unpainted, or painted one side, or painted two sides at the mill, as ordered. If received unpainted, the underside must be painted before the weatherseal is installed. If received painted one side, the weatherseal is installed painted side down, and the exposed side should be painted as soon as possible after installation. If installed painted two sides, the mill paint coat is adequate primer on the terne, and it is necessary to apply only the finish coat, or coats, as desired.

Weathersealing may be painted to match or harmonize with any roof, from slate to bright asphalt shingles, or tiles of any color. A list of 37 major paint manufacturers and their recommendations is included in the bulletin “How to Paint Follansbee Terne Metal Roofs.” A good paint job is obtained when the suggestions included in this booklet are closely followed.

Follansbee Terne Metal is flexible in application—it may be used for any weathersealing application. It comes in a wide variety of widths; it has a low expansion and contraction rate; it has a rugged strength—tensile strength is 45,000 lbs. per square inch; it resists tearing—the base metal is steel; it is fire-resistant—all metal, with nothing to burn; and it has a low maintenance cost—only an occasional painting. All these features add up to a completely satisfactory weathersealing material.

Box ternes are still available, but with comparatively fewer applications, especially since roofers and builders have come to realize that the idea that cross-seams allow for expansion and contraction is erroneous—the metal can only expand and contract by breaking open the solder in the seams. With continuous rolls of Terne Metal, this factor is so negligible that it need not even be considered.

Pre-cut flashing shingles, 5” x 7”, IC gage, painted two sides, can be supplied in packages of 100.
BASE METAL FOR TERNE: Two thicknesses of base metal are available—standard IC gage (approximately 0.0122" thick), and IX gage (approximately 0.0155" thick). IC gage is most widely used on all domestic and most industrial and commercial weathersealing applications. IX gage is made only on special order for extremely wide gutters and some industrial service, where extra heavy base metal is required.

COATING GRADES: Coating grades are expressed in terms of total weight of coating on a given area. This area, by old trade custom, is the total covered by a box—112 sheets—of 20" x 28" terne plates, and amounts to 436 square feet.

We recommend 40 lb. coating (available when not restricted by government order), because the extra thick coating provides an additional safety margin for satisfactory, trouble-free service, with only an occasional painting, for the life of the building. However, we also recommend 20 lb. coating, which is adequate for good service, when repainted as the rest of the structure is refinished. Some 8 lb. terne is available, but it is not recommended except for special or temporary applications.

EXPANSION AND CONTRACTION: When weathersealing with Terne Metal, there is no need for expansion allowances or joints, for terne expands and contracts only 0.2195" per 30 lineal feet for a 100°F temperature change. Terne Metal is tough enough to absorb these slight changes, therefore the expansion and contraction features may be completely ignored.

TABLE: Expansion per 30 feet of Metals per 100°F Temperature Rise

<table>
<thead>
<tr>
<th>Material</th>
<th>Expansion</th>
</tr>
</thead>
<tbody>
<tr>
<td>Terne Metal</td>
<td>0.2195</td>
</tr>
<tr>
<td>Copper</td>
<td>0.3192</td>
</tr>
<tr>
<td>Aluminum</td>
<td>0.4608</td>
</tr>
<tr>
<td>Lead</td>
<td>0.5724</td>
</tr>
<tr>
<td>Zinc</td>
<td>0.6228</td>
</tr>
</tbody>
</table>

TABLE: Tensile Strength of Metal Weathersealing Materials

<table>
<thead>
<tr>
<th>Material</th>
<th>Tensile Strength</th>
</tr>
</thead>
<tbody>
<tr>
<td>Terne Metal</td>
<td>45,000 lbs. per sq. inch</td>
</tr>
<tr>
<td>Zinc—Across Grain</td>
<td>36,000 lbs. per sq. inch</td>
</tr>
<tr>
<td>Copper</td>
<td>32,000 lbs. per sq. inch</td>
</tr>
<tr>
<td>Zinc—With Grain</td>
<td>27,000 lbs. per sq. inch</td>
</tr>
<tr>
<td>Lead</td>
<td>1,780 lbs. per sq. inch</td>
</tr>
</tbody>
</table>

THESE BULLETINS WILL BE OF INTEREST TO YOU:

"How to Weatherseal with Follansbee Terne Metal"
"How to Install Follansbee Terne Metal Roofs"
"How to Paint Follansbee Terne Metal Roofs"

COMPLETE ROOFS OF TERNE

The properties of Follansbee Seamless Terne Metal roofing that make it desirable for Weathersealing also make it the best material for complete roofs. The architect and the man of the house like the good design features and the fine service it renders; the woman of the house likes its beauty of design and the color range it makes possible by the use of paint; and the builder, in addition to liking all these qualities, knows that he can build a house with a Terne Metal roof incorporating lighter structural design, because he is free of concern for the weight of the roof.

A terne roof is easy to install, for there are no cross seams in Follansbee Seamless roofing to plague the roofer. It is easy to maintain, simply by painting the roof—to match or harmonize—each time the sides and trim of the house are painted.

FOLLANSBEE STEEL CORPORATION
PITTSBURGH 30, PA.
ROOFS must meet two major requirements . . . they must be in harmony with the architectural pattern of the house and must provide sufficient strength to resist winds, sustain snow loads, keep out heavy wind and rain.

Basic roof types commonly used are the gable, hip, hip and valley or intersecting gable, gambrel, and flat roof. The weight of the roof covering is supported by roof sheathing which provides a nailing surface for the roofing material, braces the rafters, and also helps to keep the interior of the building warm.

ROOF SHEATHING

Roof sheathing can consist of boards laid square across the rafters in varying widths with edges tightly butted or matched. Where rigid roof structure for good wind resistance is desired, diagonal treatment just as for wall sheathing results in greater strength.

Plywood Roof Sheathing

Plywood can be used for roof deck-
ing in thicknesses varying with roof loads and rafter spacing. FHA accepts 5/16-inch plywood roof sheathing over rafters 16 inches on center under both wood and asphalt shingles. However, unless 3/4-inch plywood is used, wood shingles must be applied with nailing strips. If 3/4-inch thickness is used, the rafters may be spaced 24 inches on center under certain conditions.

Correct nailing techniques must be followed for fastening the plywood and other components of the roof. For thickness of 7/8, 3/4 and 1/2-inch, 6d common nails should be used and nails should be spaced not more than 6 inches apart at the edges and not more than 12 inches apart elsewhere. Edges should be protected against the weather along cornices and rakes by a lumber strip, by flashing or by a strip of exterior waterproof plywood.

Insulating Sheathing

Some roof sheathing materials which also combine insulating qualities are available in panels up to 8 by 14 feet. These require fewer handlings and fewer nailings than with materials of smaller size. Asphalt or asbestos roof shingles can be applied directly to such sheathing by applying furring strips 12 inch on centers to the rafters and nailing the sheathing to the furring strips. When wood shingles are used, furring strips are applied to the sheathing and nailed into the rafters at whatever centers the shingle size demands. The resulting air space between the shingles and the sheathing further increases insulation value and helps prevent rotting of the shingles.
ROOFING

Shingles made of wood or of a mixture of felt and asphalt covered with crushed slate, or of combinations of asphalt and cement are the most common type of roofing. It is always important that manufacturer's specifications be followed in installing any roofing.

Wood Shingles

Wood shingles may be nailed over 1 by 3-inch or 1 by 4-inch strips, spaced the same distance apart on centers as the shingles are exposed to the weather; or the shingles may be nailed on a tight deck of square-edge or matched boards. Joints between shingles in any one course should be at least 1½ inches from joints in the course next below so that driving rains will not work across underneath the shingles and penetrate the roof. Shingles in each course should be spaced not less than ½-inch apart.

The type of nail used with wood shingles is important because ordinary iron shingle nails will rust and loosen the shingle long before the shingle itself is in need of replacement. Therefore, hot-dipped, galvanized or copper or bronze nails should be used. A round nail with blunted three-cornered point is ideally suited for putting on shingles as it is less likely to split the wood.

Asphalt Roofing

The importance of proper application of asphalt roofing is indicated by the fact that about 85 per cent of current roofing requirements is met by this type of material. When old roofing remains in place, removal of old wood shingles, old asphalt shingles, or old roll roofing generally is not necessary if: (1) the deck and framing are strong enough to support workers and new roofing, as well as snow and wind loads; (2) the deck is sound and will give good anchorage for nails.

When the building is situated in a high wind area, shingles at eaves and rakes should be cut back far enough to allow application of 1-inch wood strips four to six inches wide.

To prepare old asphalt shingles for new asphalt roofing, nail down or cut away loose, curled or lifted shingles; remove loose and protruding nails, and remove badly worn edging strips and replace with new ones.

To prepare old roll roofing, slit buckled sections and nail the segments down smoothly, and remove loose and protruding nails. If some of the old roofing has been torn away, leaving parts of the deck exposed, examine these exposed areas for loose or pitchy knots and excessively resinous areas. Cover these defects with sheet metal.

If old roofing has to be taken off, repair the framing where necessary to make it level and strong; remove all rotten or warped sheathing (delaminated units in the case of plywood) and replace it with new material, and pull out all protruding nails and re-nail the sheathing firmly.

If the old deck is a slotted deck, fill in all spaces between boards with securely nailed wood strips of the same thickness as the original boards; or move the existing boards together and then sheath the remainder of the deck as if a new deck were being built. Patch defects with sheet metal.

The last deck preparation detail is to sweep the surface thoroughly.

Metal Drip Edge and Eaves Flashing Strip

Before actually laying asphalt shingles of any type, a metal drip (Continued on page 240)
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- Beautiful—adds distinction and value to any building
- Durable—lasts a lifetime
- Economical—moderate initial cost—practically no upkeep
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Fig. 1—Wood deck for asphalt roofing. Plywood decks should be at least 3/16-inch thick and of either 3-ply or 5-ply plywood. Maximum center spacing between supporting members should be 24 inches. After the deck is completed it should be protected by an underlayment of asphalt saturated felt not heavier than 15 pounds to the square.

(Continued from page 238)

edge and an eaves flashing strip should be applied.

A metal drip edge (see Figs. 2 and 3) is a strip of corrosion-resistant 26-gauge sheet metal laid along the eaves and the rakes. Galvanized steel, painted on both sides, is customarily used. Secure the strip with roofing nails spaced 8 to 10 inches apart along the inner edge of the strip. Bend the strip down along rake and eaves lines. The metal should extend two to four inches back from the edge of the deck. Prefabricated metal drip edges made especially for the purpose can be used.

Fig. 2—Metal drip edge

The eaves flashing strip (see Fig. 3) is made of 90-pound mineral-surfaced or 65-pound smooth roll asphalt roofing. It overhangs the lower edge of the drip edge from 12 to 18 inches and extends up the roof to a line at least 12 inches inside the inside wall line of the building; the flashing strip should never be narrower than 36 inches.

Asphalt Strip Shingles

On top of the eaves flashing strip and flush with its lower edge, a starter course is laid with shingle tabs facing up the roof. About three inches is cut off the end of the first strip so that cutouts in the starter course will be covered by the first regular course. With hex strips, the first strip is not cut.

Application of three-tab square butt strips is shown in Fig. 4. Fig. 5 shows two-tab hex strips, and Fig. 6 shows three-tab hex strips.

The manufacturer's instructions should be followed for nailing. Galvanized roofing nails with heads at least 3/4-inch in diameter and shanks long enough to penetrate to, but not through the bottom of the roof deck should be used.

Individual Asphalt Shingles

Application of giant individual shingles also calls for metal drip edges and eaves flashing strips, and

(Continued on page 242)

Fig. 3—Eaves flashing strip

Fig. 4—Three-tab, square butt, asphalt strip shingles, with cutouts centered over tabs of shingles in preceding courses

Fig. 5—Two-tab, hex strip shingles
LOW COST

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You can make every house in the block look different—at no extra cost. Buy shakes in a variety of colors. Mix ‘em and match ‘em to take the “sameness” out of your project of homes.

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Ask any builder who has spotted “some shake houses among the others.” The shake homes will sell faster every time. Try it and see. Your customers want real wood, quality walls, and you can give them what they want—at no additional cost.

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The phenomenal increase in the use of pre-stained cedar shakes by the cost-conscious big builders of America is no accident! They are calling this colorful wood wall “the only luxury siding in the low-cost field.” Try cedar shakes on your next job. Cost-compare them with the material you’ve been using. Check on their sales appeal. You’ll be convinced!

STAINED SHINGLE & SHAKE ASSOCIATION

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APRIL 1952
ROOFING — continued from page 240.

Fig. 6—Three-tab, hex strip shingles

Fig. 7—Hip and ridge shingling for asphalt shingles

Fig. 8—Giant individual shingles. American method

Fig. 9—Giant individual shingles. Dutch lap method

Fig. 10—Individual hex shingles, staple-down type

Fig. 11—Individual hex shingles, locking tab type

Fig. 12—Locking devices, interlocking asphalt shingles

Fig. 13—Locking methods, interlocking asphalt shingles
is shown in Figs. 8 and 9. Over old asphalt roofing, nails should be 1 1/2 inches long. Over old wood shingles, they should be 1 3/4 inches long.

Each shingle in the Dutch lap method is secured with two nails and one fastener. When application is from left to right, there is one nail in the upper left corner and one in the lower right corner. The lower left corner is secured with a galvanized wire staple or copper clip. This corner should not be nailed down.

Locked-Down Individual Shingles

Individual hex shingles are of two types—those that fasten with staples at the bottom corners, and those with locking tabs. Figs. 10 and 11 show application of these two types. Application can start at either side of the roof or at the center. If it is desired that both rakes present the same appearance, the center-starting method must be followed.

Interlocking Shingles

Interlocking shingles can be classified in four groups according to the locking method used (Fig. 12). Except for the Dutch lap type (No. 4 in Fig. 12), they can be laid from left to right, right to left, or each way from the center. Fig. 13 shows how the locking devices of the four categories of interlocking shingles work.

In applying types 1, 2, and 3 in the center-starting method, a center chalk line should be placed on the deck halfway between the rakes. The first course starts with a shingle centered on this line, and application proceeds in both directions to the rakes; end units are trimmed flush with rake edges. Otherwise, instructions for cutting and placing shingles are similar to those for end-starting application.

Asphalt Roll Roofing Application

It is preferable not to apply roll roofing at a temperature below 45 degrees Fahrenheit. When it is necessary to handle roofing at a temperature below this, the roofing should be warmed before it is unrolled. Roofing should be cut into 12- to 18-foot lengths, which should then be spread on a smooth surface until they flatten.

Either lap cement or special quick-setting cement, as recommended by the manufacturer, should be used. Cement should be kept in a warm place before using. If cement must be warmed quickly, place the unopened container in hot water. Never heat any kind of asphalt cement directly over fire.

Nails for roll roofing applied directly to a wood deck should be galvanized roofing nails with heads at least 3/4-inch in diameter and shanks 7/8-inch or 1-inch long. Over old roofing, use nails long enough to penetrate the worn material and to go into the sheathing at least 3/4-inch.

The exposed nail and concealed nail methods are shown in Figs. 14, 15, and 16.

Nineteen-Inch Selvage, Double Coverage Roll Roofing

For this type, some manufacturers direct that cold asphalt adhesives be used and others specify hot asphalt. It is important to follow the manufacturer's directions exactly. Fig. 7 shows application parallel to eaves. Application parallel to rakes is generally similar to application parallel to the eaves. The starter strip is laid along the rake instead of the eaves. For hips and ridges (Fig. 18) 12-inch-wide shingles are cut from the roll and are bent lengthwise through their centers. Beginning at the lower end of a hip or at either end of a ridge, each unit is lapped 19 inches over the previous one.

(Continued on page 248)
YOU NAME IT... TEX-LOK covers it handsomely & ruggedly!

IT'S HEAVY DUTY!
IT'S DOUBLE COVERAGE!
IT'S INTERLOCKING!

TEX-LOK shingles stay put! Concealed nailing at four points plus interlocking keeps 'em down—come high winds and heavy weather. They're heavy duty and double coverage—providing more than two layers of asphalt shingles over the entire roof area. Fire-resistant, of course—and mighty attractive in either plain or textured surface and beautiful colors. And—TEX-LOK shingles carry a name that millions know and trust—Texaco.

TEX-LOK shingles are available in the areas currently served from roofing plants located at Lockport, Illinois; Port Neches, Texas and Port Wentworth, Georgia.

In the Northeast, it's TEX-LATCH
Tex-Latch is similar to Tex-Lok except in method of locking tabs. Tex-Latch shingles are available from the Edge Moor, Delaware roofing plant.
New Kind of Beauty!
It Has Durable Beauty! Lovely Colors! Embossed Striated Surface Texture!
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It is deeply striated by embossing ... smart and distinctive.
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The water-repellent, stain-resistant finish that's exclusive with Flintkote: Dura-Shield!
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That bright edge around the house advertises you as a modern builder. And the figures show you're a smart builder... when you buy rustproof permanence at lowest cost, and save still further by easy slip-joint application without soldering. You do better for yourself and for your customer with the permanent, non-staining beauty of Reynolds Lifetime Aluminum Gutters and Downspouts. Military needs for aluminum limit supply, but Reynolds is rapidly expanding primary capacity. Write for literature. Reynolds Metals Company, Building Products Division, 2003 South Ninth Street, Louisville 1, Kentucky.

5" Ogee and Half-Round Gutters in smooth and stippled finish. Also 6" Industrial Half-Round.

Rectangular Conductor Pipe 2 5/8" x 3 1/4"

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The Rustproof Flashing
That Costs Less, Works
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Aluminum costs much less than any other rust-proof flashing, but that’s just the first advantage. It’s also easiest to handle, form, cut. It looks best, and it cannot cause stains.

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IN 50-FOOT ROLLS—14", 20" and 28" wide. .019" thickness (26 U. S. Std. Gauge).
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No Rust, No Stain, No Deep Setting or Puttying... when you use
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Roofing nails, wood siding nails, common nails, aluminum siding nails, cedar shake nails, wallboard nails, gypsum nails, asbestos shingle nails.

REYNOLDS ALUMINUM
to allow roof decks to warp because a clean, level roof deck is a prerequisite to maximum serviceability of these shingles. The minimum roof pitch usually specified is five inches per foot. Roof boards are covered with one layer of asphalt-saturated felt (not less than 15 pounds weight), with a 2-inch horizontal lap, a 6-inch end lap and a 12-inch lap at hips and ridges.

Application of a wood cant strip along the eaves, flush with the lower edge, gives a proper pitch to the shingles. Starter courses are placed under the felt; the first course is laid on the felt.

**Flashings, Roof Valley**

In localities subject to extreme winter weather, eave flashing is recommended. This should extend back at least 12 inches up under the roof beyond the inside wall surface and downward to the edge of the deck.

Nail holes are punched in the shingles at the factory. Special galvanized neopoint nails 1 1/4 inches long are used. Shingles can be scored and broken or cut with a cross-cut saw or coarse hack saw. Most dealers' offices will have portable shingle cutters for the use of customers.

It is important that tight nailing (which may cause cracks or cocking) and loose nailing (which results in rattling) both be avoided. To allow for thermal dimensional changes, shingles should be spaced not less than 1/16-inch apart at end joints. Valleys, flashings, hips and ridges must be pointed up with plastic cement. Valleys, gutters and crickets can be leveled out with lath and roof cement to eliminate sharp corners and to make sure that a smooth, even base is provided for laying felt. Continuous felt strips should be used wherever possible, laid so that the water runs over laps, and never against exposed edges. The use of copper or other non-corrosive metal for the lining of valleys and for flashing is recommended.

The use of specially made hip and ridge shingles, cut to a taper or flair, saves much time. To provide a nailing base, it is necessary to nail a furring strip along each side of hips and ridges, butting the strips at the apex of the ridge.

**Asbestos-Cement Corrugated Sheets**

This material is incombustible, non-corrosive, weatherproof, and attractive; it is most useful for roofing farm buildings, garages and hangars, and light industrial buildings. It is especially economical for industrial buildings because it contains nothing that can rust or rot and its manufacturers claim that it gives permanent service without maintenance since it requires no paint or protective coating of any kind. Therefore all maintenance costs are eliminated and the first cost is the last cost.

The material is drilled with twist drills and fastened with screws or bolts, and can be sawed either with a hand saw or a portable power saw having an abrasive wheel.

Corrugated sheets are 42 inches wide and come in lengths ranging from 3 to 12 feet long, in 6-inch multiples, and have an average thickness of 1/4-inch. Some manufacturers make an over-all depth of 1 1/4 inches and 4 1/2 pitch (center to center), with

(Continued from page 243)

**Asbestos-Cement Shingles**

An outstanding feature of the modern asbestos-cement shingles is the interlocking design which permits firm anchorage with concealed nailing, each shingle being locked fast to the adjacent shingle. These shingles come in strips, are self-aligning and self-spacing; they are easy to apply and since each strip covers a large area, they speed application. Accessories such as eave starters, hip and ridge shingles and ridge rolls which are purchased separately, are available for all types of asbestos-cement shingle roofs.

Installation should be made in dry weather and care should be taken not
American Colonial

The most beautiful popular-priced

Asbestos Roof ever developed by Johns-Manville

In pleasing colors...with rich texture...

J-M Asbestos Shingles are fireproof, rotproof and weatherproof

American Colonials are rigid shingles made of asbestos and cement—two practically indestructible minerals. They have the same sturdy qualities that have proved themselves over the past 40 years in all J-M Asbestos Shingles, but in addition they have a new styling, new striking beauty of design and a new note of architectural simplicity and distinction.

Johns-Manville developed the American Colonial Shingle so that the beauty, permanence and fireproof qualities of an asbestos shingle roof could be enjoyed by the owner of even a modestly priced home. They are economical in cost, economical to apply.

For full details and a free brochure showing the full color range of American Colonial Shingles, write Johns-Manville, Box 290, New York 16, N. Y. In Canada write 199 Bay Street, Toronto 1, Ontario.

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April 1952
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Ruberoid Roll Roofing... the original and still the best after 60 years of proved performance. Smooth-surfaced, Mineral-surfaced and Drip-Coverage, which offers virtually a built-up roof.

Shake-Design Roll Siding... gives old homes new life and saves money too! Shake-textured beauty, lasting fire and weather protection open the door to low-cost modernization jobs.

Stonewall Board... the asbestos-cement building board of 1,001 uses. Ideal for soffits, partitions, garages, closet linings, etc. Fireproof, rat-proof, rot-proof, rustproof, rugged, yet easy to work.

Color-Grained Siding... Ruberoid's new decorator-designed asbestos siding, which is creating a sensation in the siding market. It's an unprecedented advance in sidewall beauty, accomplished through a unique process of blending color and texture.

ShadoWedge... Ruberoid's new beauty aid for builders, is a tapered asphalt undercoursing strip. It's a brand new product designed to add sales appeal to new homes or remodeling jobs. ShadoWedge creates deep shadow-lines... is fast and simple to apply... no sheathing or joint strips needed.

These are Ruberoid's most recent asphalt and asbestos product improvements that mean more color, beauty and better building at lower costs. See your Ruberoid dealer today.

Beauty, Quality, Economy specify these famous Ruberoid products for extra sales appeal
HERE ARE A FEW OF THE MANY USES OF RUGGED, WATERPROOF SISALKRAFT PRODUCTS

ASSURE LIFELONG PROTECTION AGAINST WATER, MOISTURE, WIND AND DUST

As Sheathing Paper
For Curing and Protecting Concrete
For Use Over Subfill under concrete slabs
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Applied underneath or between ceiling joists, SISALATION provides both insulation and vapor-barrier protection... at a single, low application-cost. Applied under roof rafters, SISALATION keeps attics brighter, more attractive, cleaner, remarkably cooler in summer and noticeably warmer in winter. For old or new homes.

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For the newest in roofing, look to **BARRETT**

the greatest name in roofing
10 corrugations to the sheet, and others make a 2½-inch pitch with 16 corrugations to the sheet. Special fasteners are supplied for various types of frameworks. Detailed information on installation is readily available from the manufacturers.

The minimum pitch advised for corrugated asbestos-cement roofs is three inches to the foot, and an overhang at the eaves of six to nine inches from the outside of the lower roof purlin is recommended. At the gable sheets should not overhang ends of purlins more than two corrugations.

The weight of the sheets in place is four to five pounds per square foot.

**Steel Roll Roofing**

Made of prime steel strip uniformly coated with a mixture of lead and tin, seamless steel roofing is available in rolls of 50-foot and 100-foot lengths in widths of 14, 20, 24, and 28 inches. It offers maximum strength without excessive weight, fire-retarding properties, and protection against weather. Manufacturers say that on large roof areas, use of this steel roofing results in substantial savings because of ease of installation and minimum waste. The rolls can be cut to any desired length; edges are uniformly straight and there are no buckles; field trimming is unnecessary to correct for canters.

This type of roofing should be laid on selected waterproof paper (tar paper and other types containing acid should not be used). Nails should not be driven through the strips. All solder used should be strictly half-and-half. Rosin only should be used as a flux for soldering and all rosin must be removed from seams before painting. No acid flux should be used. Roofers must wear rubber shoes and all unnecessary walking over the roof or using it for storage of other material should be eliminated.

**Copper Roofing**

This is one of the oldest types of roofing and needs no introduction. The required thickness of copper roofing will depend upon the type of construction being covered, and the location of the building. For sloping roofs of residences, 10-oz. copper has been found satisfactory; heavy industrial building construction may require weights up to 32 oz. per square foot although 16-oz. copper is considered standard for general sheet metal work in building construction. Lead-coated copper can also be obtained.

Before applying copper roofing, all roof surfaces should be covered with roofing felt over which rosin-sized paper is laid.

**Built-Up Roofing**

The built-up roof is a seamless piece of flexible waterproofed material, custom-built to fit the roof and to protect all the angles formed by the roof deck and any projecting surfaces. It can be applied either hot or cold and is fabricated from felt, pitch, asphalt, and gravel. The so-called "tar roofing" refers to a roof applied with hot asphalt or pitch. Insulation is required because of a major problem with built-up roofing is that of moisture at the underside of the roof due to condensation. It is also recommended that the insulation be protected by installing at least one ply of roofing felt under the insulation to act as a seal course.

There are distinct advantages in the use of pitch and slag or gravel surfacing. The oils in pitch are its weatherproofing elements and they are protected by the very dampness and moisture which rot ordinary materials. Pitch also has the ability to "heal" itself. Small cracks caused by heavy traffic or accidental damage to the roof will fuse together by themselves and disappear. This mobility also allows the membrane to conform to slight irregularities in the roof deck.

In the hot process of application, a first layer of sheathing paper or unsaturated felt is laid down, over which is laid tarred felt, then a coating of pitch is applied at between 350 and 375 degrees F. If asphalt with gravel surfacing is used, felt is first laid down, then topped with asphalt in which additional felt is embedded; the surface is then coated with hot asphalt into which gravel or slag is embedded.

In the cold process, felt is laid down on the roof deck according to manufacturer's specifications and asphalt is brushed or sprayed on the surface and in some cases must be allowed to set for a period of 24 hours.

**Slate and Tile Roofing**

Slate, which is a hard, dense stone, is water-tight, weatherproof, fireproof and storm-proof; it rarely requires maintenance, is highly decorative in color tones, and can be applied directly over asphalt or wood shingles if necessary. On new roofing it is laid over asphalt-saturated felt and fastened with solid copper nails. Exposed nails are covered with elastic roofing cement colored to match the general color of the slate. Surface texture is smooth or rough as desired, and comes in average thickness of ¼-inch to ¾-inch, in lengths of 10 to 24 inches.

Tile made from fine shale is also attractive, has the same qualities as slate, and is adaptable to various architectural designs. The shingles are produced in squares which permit quick and easy placement.

**Cedar Shakes**

Long used for sidewalls, pre-stained red cedar shakes and shingles are suitable for roofs that have sufficient pitch to insure good drainage. They show excellent performance where exposure to weather is greatest. Light in weight and having a low ratio of expansion and contraction with changes of moisture content, they offer strength along with economy in installation. They may be (Continued on page 256)
You may be paying more than you think, for "inexpensive" roofing. Don't fail to figure the cost of sheathing when estimating roofing expense. Certigrade cedar shingles, because of their great strength and rigidity, require only half the sheathing that you must use on ordinary roofing.

Yes, spaced sheathing costs about half as much as solid sheathing, and it also costs much less to apply! You can count on saving about $200 on sheathing and its application when you roof the typical 1952 house with cedar shingles. Normally, you will find that this saving more than makes up for the difference in cost of genuine cedar over substitute roofing.

Sharpen your pencil. Figure it out for yourself. Figure the comparative costs of cedar shingles with spaced sheathing as against substitute roofing with solid sheathing. We'll be glad to send you a handy estimating form which includes all of the cost factors in building a new roof.

FAST-SELLING CEDAR ROOFS COST FAR LESS THAN YOU'D GUESS

RED CEDAR SHINGLE BUREAU
5510 WHITE BUILDING
SEATTLE 1, WASHINGTON
METROPOLITAN BUILDING
VANCOUVER, B. C., CANADA

APRIL 1952
laid with a standard exposure on roofs of not less than one-quarter pitch.

Hand-hewn shakes, rough textured on the surface side and smooth and flat on the underside, have a rugged, rustic appearance. The so-called regular stained shakes made by some manufacturers are smooth sawn on both sides. The hand-split type usually comes in 25- to 27-inch lengths, adequate to permit a safe lap on even the maximum exposure and butt thicknesses of 3/4-inch to 1 1/2 inches. They should be laid not less than 1/4-inch apart and may be placed on the conventional 1 by 2-inch or 1 by 3-inch shingle strip, or on solid sheathing covered with waterproof building paper. Hot-dipped zinc coated or copper shingle nails should be used; and when possible, all cutting and trimming should be done with a hatchet rather than a saw. It is advisable also to lay shingles just as they come from the bundles.

**SIDEWALL SHEATHING**

Sometimes called sub-siding, side-wall sheathing is nailed directly on the frame work and forms a base upon which finish siding may be nailed. It stiffens and strengthens the house and prevents passage of cold or heat.

**Wood Sheathing**

Sheathing ties the framework firmly together as a unit and imparts some insulation and weather-tightening qualities to the exterior walls. Therefore, when boards are used they must be of adequate quality, properly fitted and nailed. Unless end-matched lumber is used, joints should come only on the studs and each board up to eight inches wide should be face-nailed at each stud with two 8d nails. wider boards should be fastened with three nails.

Experience and tests by the U. S. Forest Products Laboratory show that a wall with diagonal wood sheathing, two nails at each stud in each board, is four times as strong as a similar wall with horizontal sheathing. Furthermore, diagonal sheathing on a two-story platform-framed structure ties all elements of the first and second floors together much more efficiently than the horizontal sheathing. It also provides a better surface for nailing the finish.

**Plywood Sheathing**

Manufacturers claim that plywood imparts more than double the rigidity and strength of diagonal wood sheathing. They advise, however, that it is important that the correct grade and thickness be used for maximum economy and structural strength. The minimum thicknesses for wall sheathing are 9/32-inch for 16-inch stud spacing and 11/32-inch for 24-inch stud spacing. FHA minimum property requirements specify corner braces in house framing may be eliminated when 4 by 8-foot sheets of plywood are nailed with 6d nails, 6 inches on center on all edges and 12 inches on center at intermediate bearings.

When 5/16-inch plywood is applied as wall sheathing, wood shingles may be fastened directly with ring-barbed nails. Nailing strips must be used if barbed nails are not employed; likewise, ring-barbed nails must be used for applying asbestos-cement shingles or siding to 5/16-inch plywood wall sheathing.

**Gypsum Sheathing**

Gypsum sheathing is manufactured in panels 2 feet wide, 8 feet long and 3/4-inch thick. Each panel covers 16 square feet of side wall area; and a panel weight of less than 35 pounds permits easy handling by one man. It fits standard stud spacing of 16 or 24 inches which reduces waste to minimum. In fact, manufacturers say normal wastage is about 3 per cent. Edges provide snug and continuous contact between adjoining sheets.

Except where local building regulations require it, building paper is not needed. Gypsum sheathing may be used with wood siding, masonry veneer, wood shingles, stucco and stone or brick veneer.

**Insulating Board Sheathing**

This type of sheathing is a structural board which is usually heavier in weight than building paper. It is made of cane or wood fibres. All of the standard brands today are waterproofed either with an asphalt coating or with an integral asphalt treatment.

Two main size groups are made. One group comes in thicknesses of 3/16-inch and 25/32-inch, and dimensions of 4 by 8 feet or 4 by 12 feet. The other group comes also in 3/8-inch and 25/32-inch thicknesses and dimensions of 2 by 8 feet. One man can easily handle the panels without use of ladders or scaffolding; and some manufacturers also mark the board to show proper nail spacing and alignment.

Insulating board sheathing can be used as regular sheathing in frame construction with various exterior finishes such as wood siding, shingles, stone, brick or brick veneer. Building paper is generally specified only where insulating board is used under stucco or masonry veneer.

The 4-foot wide sheathing is applied vertically and nailed at the intermediate studs first with large headed roofing nails spaced six inches apart. Around the edges, nails are spaced three inches apart.

The 2 by 8-foot sheathing with interlocking horizontal joints is applied horizontally, nailed to the intermediate studs first with the same nails and same spacing used on the large sheaths. This method of application of sheathing is about the same as with regular wood sheathing except that the units handled are much larger. Where rigid shingles are used as exterior finish, furring strips must be applied over the insulating board sheathing unless special patented self-climbing nails are used.

Asbestos siding shingles may be applied directly to this sheathing by using self-locking nails which the manufacturer can supply; clapboard exterior and ties for brick veneer are easily nailed through the sheathing and into the studding.

Some manufacturers claim 122 to 300 per cent more insulating value for this type as compared with ordinary wood sheathing. Furthermore, the 4-foot widths provide more than

(Continued on page 269)
With any exterior...

TEMLOK MEANS STRONGER, LOWER COST CONSTRUCTION

No matter how you finish your house on the outside, Armstrong’s Temlok® Sheathing will make the structure stronger . . . tighter . . . and cut your costs in the bargain.

How Temlok adds strength. Temlok is made of tough pine fibers, mixed with asphalt and formed into strong boards (2' x 8' and 4' x 8' sizes). Because of these large sizes, Armstrong’s Temlok can give the frame much greater rigidity than horizontal wood sheathing. Due to its great built-in strength, Temlok in the 4' x 8' x 25 32" size has been accepted by FHA field offices for use without corner bracing.

How Temlok cuts costs. When used without corner bracing, Armstrong’s Temlok Sheathing will cut building costs an average of $25-$35 on a medium-size home. Because Temlok is so much easier to handle than lumber, many builders have found they save over 20% on labor time. There’s practically no waste in cutting. You also save the cost of using building paper because it’s not needed for most exteriors. You get Temlok Sheathing packaged for faster, easier handling.

For complete details on Armstrong’s Temlok Sheathing, see your lumber dealer or write Armstrong Cork Company, 1604 Ross Street, Lancaster, Pennsylvania.

ARMSTRONG’S TEMLOK
Many extra benefits

Let It Pour!
Moisture Won’t Hurt It

Even with cut edges, Celotex Insulating Sheathing has almost NINE TIMES THE MOISTURE RESISTANCE required by Federal Specifications, according to tests made by an independent laboratory. Sheds moisture. Won’t warp or buckle.

Celotex Insulating Sheathing is double-water-proofed—inside by integral treatment that coats every fibre; outside by a “raincoat” of asphalt on both surfaces and all edges. Yet it has over TWICE THE VAPOR PERMEABILITY required by Government agencies.

Celotex National Advertising Puts the Spotlight on YOU

"See your builder!" All through 1952, as in years past, that’s what Celotex will be telling prospective home buyers—in big, colorful, hard-selling ads in THE SATURDAY EVENING POST, BETTER HOMES & GARDENS, AMERICAN HOME, SMALL HOMES GUIDE.

These impressive, full-page Celotex ads are designed to build business for you. Tie in with them by emphasizing to every prospect that your homes are built with genuine Celotex Products. You’ll find this makes your selling job far easier. For over a quarter century of resultful national advertising has created unsurpassed public acceptance for the brand name Celotex!
yet no extra cost!

Celotex Insulating Sheathing does far more than ordinary sheathing yet costs no more, applied!

If you are using ordinary sheathing, you pay at least as much as usual and usually more than the cost of Celotex Insulating Sheathing, applied. Yet you get far less! For at no extra cost, Celotex Insulating Sheathing gives you all these extra advantages...

1. **INSLATES AND WEATHERPROOFS** as it builds. All at one cost. No building paper needed. Saves labor, materials.

2. **GREATER BRACING STRENGTH**, about 30% greater than ordinary sheathing. No corner bracing needed to meet FHA requirements, with 4' wide, 3/16" thick Celotex Insulating Sheathing.

3. **GOES UP 30% FASTER**. Easier to cut and fit. Up to 15% less waste. Siding or shingles can easily, quickly be applied direct.

4. **DOUBLE-WATERPROOFED**. Stack it in the open, moisture won't hurt it. Won't warp or buckle. Lets you resume work sooner after rain, cutting costly delays.

5. **IT'S THE ONLY SHEATHING** made of tougher, stronger, long Louisiana cane fibers—and protected by the patented Ferox Process from dry rot and termite attack.

So follow the lead of value-minded builders in every part of the country. Switch to Celotex Insulating Sheathing, best sheathing buy of them all. Build more comfortable, more durable, more salable homes... at lower cost. Free booklet gives complete information. Mail coupon today.

---

**Superior Bracing Strength**
Proved by "Tug of War" Test

On the left, Celotex Insulating Sheathing. On the right, ordinary sheathing. The test panels, nailed to 2" x 4" framing, were bolted to a common sill and connected by a turnbuckle.

As the turnbuckle was tightened, note how the Celotex Insulating Sheathing panel remained plumb—while the panel of ordinary sheathing was distorted. Visible proof of the superior bracing strength of Celotex Insulating Sheathing!

---

**MAIL TODAY**

The Celotex Corporation, Dept. AB-42
120 S. LaSalle St., Chicago 3, Illinois

Please send me a free copy of the Celotex booklet, "How You Can Build Better Homes at Lower Cost."

Name

Address

City Zone State
BUILDING PAPER

Building paper should be introduced between sub-siding and outside finish to prevent passage of air through the walls. It should be tough enough to withstand rough handling while putting it on, retain its strength after becoming wet, and prevent passage of moisture. It must lie smoothly and care must be taken to close all cracks around window and door openings.

A vapor barrier on the warm inside wall is considered essential when insulation is placed against sheathing. This is necessary to prevent moisture condensation within the wall. The vapor barrier is a paper which prevents vapor from entering the wall from the inside of the house. The building sheathing paper which insulates the outside wall should not only be wind and rainproof, but in contact with the vapor barrier, should allow vapor to pass through it, and should be five times as vapor-permeable as the vapor barrier.

Four main types of building paper are: (1) papers impregnated with asphalt; (2) kraft paper impregnated with paraffin; (3) laminated building papers of two or more layers cemented together with asphalt; and (4) machine-finished papers.

SIDING

Plywood

Wherever plywood is intended for permanent outdoor exposure, only the exterior type with waterproof adhesive bond can be used. The architectural design of a structure will determine largely whether it is applied vertically or horizontally in the Originally furnished sizes, or if they are to be cut, what shape the pieces must be. Plywood may be applied with molded battens, V-grooves or flush joints. It makes excellent wide siding when applied in half-panel or third-panel widths. For economy of construction, plywood panels are used successfully. For construction of single-wall structures, 5/8-inch or thicker has been used satisfactorily.

Non-corrosive nails such as the common hot-dipped galvanized type should be used. Nailing should be with 6d common or 6d box nails for 5/4-inch siding and 8d for thicker siding. When full-size 4 by 8-foot or longer panels are used, fastenings should be spaced not more than six inches on center at panel edges and 12 inches elsewhere.

There are several simple and easily adapted methods for handling joints between the panels in using exterior plywood for siding. Some suggested treatments for both horizontal and vertical joints are shown in the section on “Plywoods and Hardboards.”

All edges of plywood siding, whether covered, veed, exposed or butted, should be bedded in a thick lead-and-oil paste or other suitable compound, knifed on as the panels are applied. Following are the specifications which have been approved by FHA for filler or bedding: 100 pounds of paste white lead, 7/8 gallons of raw linseed oil and one pint of dryer. The dryer may be reduced to one-half pint if boiled linseed oil is used.

FHA minimum requirements specify that plywood used as siding must have minimum thickness of 5/4-inch with studs 16 inches on center. If sheathing is used, plywood siding may be 5/4-inch thick.

Wood Siding

Wood siding is variously known as drop or rabbeted, rustic and beveled, or bungalow siding. But except where heating conditions are not a consideration, or in the extreme south, sheathing is a “must” to reinforce wood siding.

When drop or rabbeted siding is used, the height of the board over the next below is determined by the depth of the rabbeting; with beveled siding the lap can be varied as the builder desires. It is always desirable to “lay out” the siding before it is applied, so that the bottom edge of some strake will occur at the bottom edges of the window sills and that of another strake will run neatly over the top on the frame or drip mold. This avoids the necessity of cutting or notching around openings.

For beveled siding a nail should be driven at every stud and located so that it will pass through both the outside piece and the top edge of the piece immediately under it; thus every piece will have two nails to secure it in place. Galvanized nails should be used to avoid rust. The nail is best driven flush and not set (unless also putted) so that no place is left for water to lodge and work into the wood.

Wherever two pieces of siding meet or butt, the joints should be square. Corners can be finished as follows:

1. Against corner boards: In selecting size of corner boards, one piece should be wider than the other; so that when the corner board will have the same appearance from either side; and the size should provide nailing on the corner posts for the ends of the siding. Also, corner boards should have slightly greater thickness than the ends of the siding. The minimum thickness for 6-inch siding is 5/4-inch. For heavier sidings, heavier corner boards are required.

2. Mitered corners: These are more troublesome than corner boards but more pleasing in appearance. Corner board methods are more air-tight and water-tight and less likely to open up.

Bevel Siding

The bevel siding so common today is almost like the early clapboards which were sawed with one edge thicker than the other so that they would fit more snugly against the framing. Bevel siding is customarily made in 4, 5, 6, 8, 10 and 12-inch widths and usually 5/8-inch thick on the thin edge and 3/4-inch to 5/4-inch thick on the other edge. Bevel siding 8 inches and wider is often called “bungalow” or “wide Colonial” siding, and often has shiplapped or rabbeted joints so that the sidings lie flat against the studs instead of touching it only near the joints as ordinary bevel siding does. This reduces the apparent thickness of siding by 5/8-inch but permits use of extra nails and reduces the chance of warping. It is also economical, as rabbeted joints require less lumber than lap joints used with plain bevel siding. Rabbeted joints are not necessary for the 4-inch and 6-inch widths of bevel siding as these widths are usually 5/8-inch thick and rabbeting would make them too thin.

“Rustic” and “drop” siding is usually 5/4-inch thick. 6 inches wide and is in a wide variety of patterns. Drop siding has tongued and grooved joints while rustic siding has shiplapped joints. Drop siding is heavier, has more structural strength and because of its design has tighter joints than bevel siding; therefore it is often used on garages and barns, where there is no sheathing as well as on homes.

Cedar Shakes

Prestained cedar shakes have insulating qualities which make them resistant to heat transmission. They are commonly made in four basic grades—A, B, C and D—and are marked as to grade. For permanent and high grade construction, grades A and B are recommended. Edge-grain shingles are more resistant to weathering and are much less likely to cup or warp on the wall than shakes cut flatwise of the grain.

There are several types of cedar shakes for siding; processed shakes with parallel sides and square butts;
The Weatherbest Optional Kolor Plan for stained red cedar shake sidewalls is based on the use of Weatherbest Pryme-Shakes factory stained in one specially formulated prime color. Weatherbest Fynal-Kolor, available in twenty modern pastel and deep-tone shades, is supplied for a finish coat on the job. Pryme-Shakes and Fynal-Kolor are sold as a unit at no more than the cost of conventional stained shakes. But by use of a unique certificate ordering system, Fynal-Kolor can be requisitioned independently of the Pryme-Shakes.

BUILDING WITH PRYME-SHAKES REDUCES LABOR TIME FOR SHAKE APPLICATION AND TRIM PAINTING ... ELIMINATES WASTE AND DELAYS

Pryme-Shakes need no special care or protection since the Fynal-Kolor coat will cover all construction blemishes. Available in local stocks for immediate delivery. No waiting for special colors, no color match problems on the job. Shakes left from one house can be used on the next without regard to finish color.

CONVENIENT FYNAL-KOLOR CERTIFICATE SYSTEM PERMITS CUSTOMER CHOICE OF TWENTY GORGEOUS FINISH COLORS

For each square of Pryme-Shakes purchased you receive a certificate in lieu of Fynal-Kolor. Free color charts are furnished you for customer color selection. When Fynal-Kolor is wanted, you send in the necessary certificates and shipment is made at once direct to job site.

SCIENTIFICALLY FORMULATED FYNAL-KOLOR IS EASY TO APPLY ... ASSURES A UNIFORM AND PERFECT JOB

Made especially for use with Pryme-Shakes only, Final-Kolor may be brushed or sprayed just as it comes from the can. One coat produces an even color tone, eliminating color variation complaints and assuring complete customer satisfaction.
the simulated half-split shake with face side grooved; "invisible" joints, and under-side smooth sawn; and the hand-hewn type with face side smooth, visible joints, random thickness, and rugged rustic appearance. In the processed shakes, the machine squares up normally irregular shingle butt so that true horizontal course lines are assured and vertical edges of shakes are machined parallel.

Lengths of 16, 18, and 24 inches provide wide choice of weather exposures and permit variety in appearance. Usually they are designated as 4/2-inch or 5/2-inch depending on whether they measure four or five shingles to a 2-inch thickness.

Installation can be made either over tight or spaced sheathing, although tight sheathing is more widely accepted. However, a very satisfactory and inexpensively constructed wall can be made from sheathing spaced apart on centers equal to the shingle exposure. Building paper should be used with such construction, either between the shingles and sheathing or between the sheathing and studs.

Cedar siding shakes may be exposed to the weather more than shakes on the roof because the shingles' heat does not reach them so directly and water runs off more quickly. They should be spaced not less than ¼-inch apart; two or more nails, one near each edge, should be used in each shingle. Nails should be hot-dipped, zinc-coated, or preferably of copper or aluminum, and should be driven so that they are completely covered by the next course above; however, nail heads should not be driven into the shingles. Shingle courses should be so laid that the shadow lines fall in with upper and lower lines of window openings.

A new application tool that eliminates picking up and nailing shakes one at a time enables two inexperienced men to apply an average of six squares a day. This is a 4-foot strip of light gauge steel with half-inch deep U-shaped channel top to hold the butt ends of the shakes or shingles, and is run end to end as far along the course as desired. Several of these 4-foot units are mounted on a 1 by 2-inch or 1 by 3-inch strip 16 or 20 feet long. After insulating backing board or undercourse shingles have been installed, shakes are then inserted behind a cord or snap line and into the U-shaped channel, and the workman can go right down the line and nail them in place without stopping.

Asbestos-Cement Siding Shingles

These shingles are an economy because they require no maintenance, initial painting or other subsequent treatment for preservation. Manufacturers of some brands claim surface grime can be cleaned off by washing with soap and water. They are also fireproof and unusually weather-resistant. They are available in a variety of color, surface textures and butt lines. They can be installed directly over wood sheathing or over gypsum or insulating boards with special fasteners. Sold in squares, they are generally packed in three bundles per square with about 57 pieces 12 by 24 inches in size to the square. Manufacturers provide backer strips for use behind vertical joints and corrosion-resistant face nails. Some asbestos-cement plants also make asbestos-cement clapboard.

In order to prevent staining, wood trim is given at least a prime coat before installation of siding; and all metal, particularly copper used for flashing, is initially painted with a protective coating. The siding is installed over a layer of waterproof felt or waterproof backing board. Asphalt saturated felt is recommended as underlayment since others, such as tar-saturated felt, may cause staining. Joints in the siding are protected by using the felt backer strips.

Work is started by nailing a ¾ by 1-inch cant strip to the bottom of the walls to be sided, to give the siding a slight cant and add to the finished appearance. Chalk line marks for the top of each course all around the building help assure accurate meeting and mitering of courses and avoid wedge-shaped courses at the eave lines. The first course, extending ½-inch below the cant strip to form a drip edge, is started with a whole shingle. After backer strips are in place, the head nails are driven in as are the specially-coated face nails. At least one nail should penetrate each backer strip. A half-shingle is used for starting the second course.

To avoid smearing the face of the siding wherever siding butts against trim, masonry or other materials, asbestos caulking should be applied. All inside and outside corners are protected with vertical 12-inch strips of asphalt felt behind the siding. Special precaution should be taken with corners likely to be subjected to hard knocks by using corner boards and pre-finished metal corners; alternate shingle construction or mitered shingles are also used at corners.

(Continued from page 260)

AN ECONOMICAL METHOD of applying double-coursed wood shingles to buildings with insulating board sheathing
ASPHALT Roofings & Sidings

for every new construction and replacement need!

<table>
<thead>
<tr>
<th>Specifications</th>
<th>WOODTEX Grained Surface</th>
<th>ROLL BRICK-TEX Siding</th>
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Insulating Sidings available at York, Pa. and Chicago, Ill.

MINSERAL SURFACED ROLL ROOFINGS

- Certain-teed 90 lb.
- Certain-teed 19 in. Selvage Edge Roofing
- Certain-teed Blockedge Grained
- Certain-teed Starter and Valley Strips

SMOOTH SURFACE ROLL ROOFINGS

- Certain-teed 55 lb., 65 lb. & Guard 45 lb.
- Black & White Cap Sheet
- Base Sheet

A Complete Line of

FELTS, BUILDING PAPERS, ROOF COATINGS and CEMENTS

NOTE. A complete list of the wide variety of colors available will be sent at your request.
Quality products since 1795

Bird has been making quality products for America and its people ever since Thomas Jefferson contributed his ideas and ideals to our early growth.

Today Bird offers you the greatest achievement in a variety of asphalt shingle values.

* Thick butt construction, with extra layers of asphalt and firmly embedded mineral granules give added years of wear where it counts... on exposed tabs.
* New pastel colors!
* Fire-resistant, of course—certified by Underwriters' Laboratories.
* 215 lbs. of working weight protect every 100 square feet of roof.

PHOTO ABOVE illustrates the approved method of applying asbestos-cement siding shingles. First, the sheathing or old siding is covered with a felt underlayment. Shingles are then aligned and nailed in position, using non-corrosive nails, with a felt backer strip at each joint. Strips lap lower courses. At least one nail penetrates each strip.

Aluminum Siding

Clapboard siding made of a hard aluminum alloy is manufactured in individual courses. 7½ inches and 9½ inches wide (6½-in. or 8½-in. weather-exposed), and in standard lengths of 10, 12, 14 and 16 feet.

Covering Capacities of CERTIGRADE Shingles

Including the Number of Square Feet Covered by Four-Bundle Squares and Single Bundles for Exposures Given.

<table>
<thead>
<tr>
<th>Exposure Inches</th>
<th>Sixteen-inch Shingles</th>
<th>Eighteen-inch Shingles</th>
<th>Twenty-four-inch Shingles</th>
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<tbody>
<tr>
<td></td>
<td>4-Bundle Square</td>
<td>One Bundle</td>
<td>4-Bundle Square</td>
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<td>245</td>
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</tr>
</tbody>
</table>

*Maximum exposure recommended for roofs.
†Maximum exposure recommended for single-coursing on side walls.
‡Maximum exposure recommended for double-coursing on side walls.
New—a colored shingle that will appeal to both builders and owners!

looks like split wood...
lasts like stone!

"Century"
NU-GRAIN
asbestos-cement siding...

At last, for re-siding old homes and for new construction you can use a colored shingle that has the architectural appeal of the old-fashioned split wood shingle... but the wearing qualities of stone itself.

For the "Century" NU-GRAIN Asbestos Shingle duplicates exactly—in colored slate granules—the coarse and fine score marks of split wood.

These granules are permanently imbedded under hydraulic pressure, to make shingles in three colors that will not fade... NU-GRAIN Green, NU-GRAIN Gray, and NU-GRAIN Brown. And fire can’t burn... rain can’t soak... snow can’t rot... and termites hate "Century" Asbestos Shingles!

You’ll find the texture markings strong and visible with a straight butt shadow line so deep, it seems etched... the kind of texture that speeds sales.

Whether you’re siding one home or a thousand, "Century" NU-GRAIN Shingles give you a low initial cost and easy application that increases your profit. Ask your K&M Distributor for details... or write us direct.
Richflex

Here is a complete line of reflective insulation that permits you to offer the right insulation for the problem at the right cost to the customer. Richflex does a 4-way job. It keeps winter heat in—summer heat out—acts as a moisture barrier—acts as a cold air barrier. The special aluminum pigment used in Richflex turns back more than 75% of heat rays striking it. Richflex comes in three grades:

A—coated both sides, edge string reinforced.
B—coated one side, edge string reinforced.
C—coated both sides but without reinforcement.

Richflex is the real answer to low-cost insulation.

Richbead

Here's the right angle for dry wall construction. Richbead brings the protection of metal to both exterior and interior corners for new and existing homes. It eliminates chipped up and banged-up corners at doorway, arches, reveals and softs. It covers cracks caused by settling in interior corners and gives them clean lines.

Richbead consists of a metal angle glued to joint tape and can be installed by anyone. Richbead means a real saving in labor and reduces waste to a bare minimum and you can often show big savings by eliminating casings around doors and windows.

Richbead is easy to handle and comes in two sizes—1 by 2 inches—8 ft. lengths, 25 pieces to the box.

I could kiss you, Bill—

Where did you get your information?

Bill uses the

AMERICAN BUILDER

Catalog-Directory

Through frequent use, Bill has learned it saves him time and money. It's practically an encyclopedia of the building business —it gives you building information —building information —easily and quickly, when you need it.
Today has at his disposal kitchen and bathroom wall and utility surface materials ranging in composition from clay to laminated vinyl plastic. He may elect to use wood, linoleum, asphalt and rubber, plastic, metal, glass or ceramics. Functional qualities in relation to the job to be performed are of prime importance in governing the final selection.

Surface materials are produced by the manufacturer with four major factors in mind: (1) durability, (2) ease of maintenance, (3) decorative qualities, and (4) easy application. A combination of several surface materials may often be used in the same installation with good results. Materials impervious to water are a necessity around tubs, showers and lavatories. Materials of a softer texture may be preferred for the rest of the wall surface.

Both beauty and practical usage must be considered when selecting materials for surfacing sink, counter and work table tops in the kitchen. The same considerations enter into the selection of materials for dressing table or vanity tops in the bathroom. Each type of surface material offers specific properties which must be considered in relation to the requirements of the installation. Clay tile and certain other materials offer full waterproof, stain-proof and fireproof features. Each surface material may be one or all of the following: moisture-resistant, moisture-proof, water-resistant, waterproof, heat-resistant, fire-resistant, fireproof and stain-resistant. For certain installations on horizontal surfaces the hardness feature of the material will be of prime concern. In other cases a stain-proof hardness and lasting finish will be the requirement. Or, the decorative qualities of design and color may be of major concern and in some cases will govern the final selection.

CLAY TILE

Clay tile is made from clay and/or other ceramic materials formed to thickness and shape and baked to produce a durable material. The two general types are “glazed” and “un-glazed.” Either may be used for wall finish but for most domestic installations the glazed finish is preferred. The glaze may either be clear or opaque. Almost any color or combination of colors is available, in a veined, mottled or rippled effect. Finish of the glaze may be “bright,” “semi-matte,” or “matte.” “Bright” finish has a shiny, reflective surface while the other two finishes do not clearly reflect an image, or may be entirely without sheen.

Some firms produce pictorial and design tiles. Also available are pictorial sets of tiles. When installed, the final result is a large wall design or mosaic picture.

Tile thicknesses vary with the manufacturer but run approximately 3/8-, 3/4-inch and thicker for normal wall application. Two basic grades of tile are produced: standard grade (blue label) and seconds (yellow label). “Seconds” have slight imperfections which in no way affect the wearing qualities.

LINOILEUM AND RUBBER

Linoleum and rubber types of wall coverings are available in rolls or cut tiles in varying sizes. Thicknesses, tile sizes and roll widths vary with the manufacturers.

Preparing Surfaces
Linoleum or rubber materials may be applied directly to any smooth surface, above grade, provided no seepage occurs on the base surface. This includes such surfaces as one- or two-coat plaster, hardboard, plywood, gypsum lath or dry concrete walls. It is well to note that if the surfaces to be covered are not smooth and level the glossy surface of the material will cause highlighting at random which will result in a warped and wavy appearance of the wall or surface. All unevenness is accentuated after the surface material has been applied.

When old walls are being covered, all previous wall covering must be removed. Wash grease and dirt from...
HOW TO INSTALL FLEXIBLE SHEET MATERIAL

HOW CLAY TILE IS SET ON VERTICAL SURFACES. Dampness protection for wood members that are to receive metal lath and scratch work for tile is provided by building paper or creosote or asphalt paint. If the scratch coat is applied with reasonable care, the mortar setting bed will provide a suitable surface and the "levelling" or "plumb" coat may be omitted. The mortar setting bed is screeded to a properly trued-up plane to receive the tile. It is spread over areas no greater than will be covered with tile while the setting bed remains plastic. Either the floating or the buttering method may be used by the tile contractor in setting the tile. Vertical units must be maintained plumb, level and even. Finished surface must be brought to true and flat planes.

CUSHION EDGE

SQUARE EDGE

TILES may have either square or cushion edges. The cushion edge has a slight curvature at the facial edge.

surface with washing soda, rinse thoroughly with clear water and wipe dry. Cracks and holes should be filled with non-shrinking fill. Rough spots and trowel marks should be removed with coarse sandpaper. Bring exterior and interior corners to a true plumb and square if the surface is to be in tile shapes. When applying roll-type materials, the interior and exterior corners may be rounded to a 3/4-inch radius. If gypsum wallboard is the base, the surface should be sealed with one coat of primer; around tums two coats should be used. Only a non-metallic tape and cement flush-joint system should be used on the gypsum board. An opening of about 3/4-inch should be left between gypsum board

and recessed tums to permit grouting with a water-resistant, non-shrinking plastic compound at the time the surface material is applied. Enameded surfaces should be sanded to afford a satisfactory bond.

Figures 1-5 illustrate the procedure for installing linoleum and other flexible material on vertical surfaces.

(Continued on page 272)
The picture windows in this kitchen face on scenic beauty that extends for miles. The specifications, which read "Sinks and Counter Tops \( \frac{1}{16} \) Formica on water-proof plywood," provided the "long view" inside.

That qualifying phrase "or equal" is seldom associated with Beauty Bonded Formica. For beauty, for durability, for range of color and pattern selection, Formica is in a class alone.

If years and years of carefree use with no maintenance cost is the aim—the long view calls for genuine Formica.
WHEREVER THERE'S A TOP — THERE'S A USE FOR
GENERAL ELECTRIC TEXTOLITE®

General Electric Textolite plastics surfacing comes in
dozens of exclusive patterns and colors. Use it wherever
a durable surface is needed — tables, counters, work
surfaces of all kinds — in homes, stores, restaurants.
A variety of gay patterns and solid colors make
General Electric Textolite as pretty as it is practical.
Textolite's beauty lasts and lasts. It's scratch and heat
resistant, withstands boiling water, scalding greases,
even resists burning cigarettes. General Electric Texto-
lite is stain resistant, sheds fruit juices, alcohol, ordinary
household chemicals and acids without a trace. It's easy
to keep Textolite tops clean. Just a swish with a damp
cloth restores the original sparkle and luster.

WHERE FOOD AND DRINKS ARE SOLD

For COMMERCIAL INSTALLATIONS, G-E Textolite
tops offer many advantages. Their colors blend beauti-
fully with any decorative scheme. Customers like the
atmosphere created by G-E Textolite surfacing. And
hotel and restaurant managers appreciate the savings in
maintenance costs that G-E Textolite tops make
possible. For soda fountains, cocktail tables, restaurant
counters, and dozens of other applications, G-E Texto-
lite tops offer an unusual combination of utility and
beauty. They "wear like iron; clean like glass."

G-E TEXTOLITE READY-BONDED TO RODDISCRAFT PLYWOOD

For your added convenience Roddis-craft warehouses
have engaged leading fabricators in each warehouse
community to bond G-E Textolite to Roddis-craft Ply-
wood. G-E Textolite professionally bonded to Roddis-
craft Plywood can be cut and installed by carpenters
with ordinary tools. No gluing or clamping necessary.
Ask your Roddis-craft dealer about G-E Textolite
Ready-Bonded Tops.

AVAILABLE WHEN YOU WANT IT

A nationwide warehouse service makes delivery of G-E Textolite fast
and reliable. For complete information — patterns, prices and prompt
service get in touch with your nearest Roddis-craft dealer.

NATIONWIDE Roddis-craft WAREHOUSE SERVICE

Cambridge 39, Mass., 229 Yavor St....Marshfield, Wis., 115 S. Palmetto St.
Charlotte 8, N. C., 123 E. 27th St....Milwaukee 8, Wis., 4601 W. State St.
Chicago 32, Ill., 2845 W., 41st St....New York 55, N. Y., 922 E. 41st St.
Cincinnati 2, Ohio, 4836 Depot St....Port Newark 5, N. J., 103 Marsh St.
Detroit 14, Mich., 11855 E. Jefferson St....Philadelphia 34, Pa., Richmond & Topeka Sts.
Kansan City 9, Kan., 25 Southwest Blvd....St. Louis 16, Mo., 3344 Morganford Road
Los Angeles 58, Calif., 5202 E. Vernon Ave....San Francisco 24, Cal., 345 Williams Ave.

AMERICAN BUILDER
A new line of MARLITE PANELS for creating beautiful, low-cost interiors

... in Homes, Apartment Buildings, Institutions, Churches, Schools, Hotels, Theaters, Clubs, Bars, Stores, and other commercial installations.

Seven beautiful new Wood Panels plus a new Hi-Gloss finish on Marlite Plain-Colors, Horizontale, and Tile Patterns make the Marlite line the most attractive and complete in the industry.

The exclusive high-heat-bake Marlite finish on every panel permanently fixes the "decorator-correct" colors and seals the surface against dirt, grease, moisture, ordinary acids and household stains.

Flexible, durable, waterproof Marlite, with a strong base of Masonite Duolux, is manufactured to the highest standards by the world's largest exclusive manufacturer of prefinished wallpanels.

COLORS AND FINISHES

PLAIN-COLORS DELUXE FINISH—A special top-quality wallpanel with a hand-polished finish that adds an extra touch of beauty and sparkle to every installation.

HORIZONTALE

PLAIN-COLORS

Jaqquil Yellow
Cream
Mist Blue
Coral
Spring Green
White
Persian Red
Pearl Gray
Royal Blue
Black
Jaqquil Yellow
Cream
Mist Blue
Coral
Spring Green
White
Persian Red
Pearl Gray
Royal Blue
Black

HI-GLOSS FINISH—A high-quality, low-cost wallpanel with a high lustre, mirror-like finish. In the same low price range as Marlite Velvetex.

PLAIN-COLORS

Ivory
Pastel Green
Desert Ton
Pastel Blue
Pastel Yellow
Swan White
Dove Gray

HORIZONTALE

Ivory
Pastel Green
Desert Ton
Pastel Blue
Pastel Yellow
Swan White

TILE-PATTERN

Ivory
Pastel Green
Desert Ton
Pastel Blue
Pastel Yellow
Swan White

MARLITE SIZES AND PATTERNS

ALL PANELS 5/32" THICK

WOOD PANELS: Blond Mahogany, Striped Mahogany, Silver Walnut, Natural Walnut, Light Oak, Gray Prima Vera, Natural Prima Vera in rich patterns that faithfully reproduce the natural grains of selected woods, 48" x 72" and 48" x 96" with grain running in the direction of the second dimension.

MARBLE PATTERN: Rose De Brignoles, Jaunte Benou, Black and Gold, Skyros and Verdi Antique in stately, authentic reproductions of rare, imported marble, 32" x 48" and 96" x 48" with grain running in the direction of the second dimension.

HORIZONTALE: Two pairs of score lines, centered 16" apart, run with the length of the panel. Standard sizes—4' x 4', 4' x 5', 4' x 6', 4' x 8' x 96', 4' x 12'.

PLAIN-COLORS: A wide range of gay, cheerful colors for smart-looking interiors. Standard sizes—4' x 4', 4' x 5', 4' x 6', 4' x 8' and 4' x 12'.

TILE-PATTERN: New striping method adds beauty of single sizes, spaced 4" apart, vertically and horizontally.

QUICK FACTS ABOUT MARLITE

USES. Walls, ceilings, doors and cupboards in residential bathrooms, kitchens, utility and recreation rooms, dens and powder rooms. And every type of commercial interior, including counters, displays, display window backgrounds, elevator interiors and landing areas.

FOR NEW CONSTRUCTION OR REMODELING. Large, easy-to-handle panels cover old walls or new. Present surface need only be dry, and reasonably smooth and straight.

EASY TO WORK. Marlite is easy to cut and fit with ordinary carpenters' tools. Panels cover wide areas swiftly. During remodeling, busy areas remain in service without interruption.

EASY TO CLEAN AND MAINTAIN. Marlite's lustrous finish is as durable as that on the finest refrigerator or display case, requires only an occasional wiping with a damp cloth to restore all the sparkling beauty. Never requires refinishing, painting or redecorating. Commercial users have cut maintenance costs as much as 75%. During commercial renovating, there is never any paint odors...never a need to move out perishables. Business goes on uninterrupted.

WIDE RANGE OF COLORS AND PATTERNS. Among Marlite's 67 color and pattern combinations, builders find a distinctive Marlite color and pattern to suit any decorative theme...permitting modern, beautiful interiors that are both pleasing and practical at moderate cost.

MOULDINGS FOR EVERY INTERIOR

Marsh Mouldings for any type wallboard interior bring enduring freshness to renovated rooms or brand-new installations. Aluminum Alloy and Preswood shapes include matching mouldings for the striking new Marlite Wood Panels and Marble Patterns. In addition, Marsh Color-Matched Aluminum Mouldings match every Marlite panel color, featuring the genuine high-heat-bake Marlite finish.

SPECIFICATION AND INSTALLATION DETAILS

See your local Marlite dealer, or write for free, illustrated folders giving complete information on Marlite, Marsh mouldings for every type installation, Marsh caulking, adhesive and polish. Insist on genuine Marlite, your guarantee of quality.

manufactured exclusively by

MARSH WALL PRODUCTS, INC., DEPT. 403, DOVER, OHIO
SUBSIDIARY OF MASONITE CORPORATION

APRIL 1952
INSTALLING TILE SHAPES

The same basic principles of tile application are used for asphalt, rubber, linoleum, plastic, metal or hardboard tiles. The composition of the tile will govern the specific adhesive compound to be used. Whether the tile is of the square edge or interlocking variety, the procedure is to start at the bottom and build upward on the wall. The fitting of one tile on another makes for self-alignment.

In preparing for the tile job, a line should be drawn at the lowest point of a tub in a bathroom, or of a sink in a kitchen, equivalent to the height of a full tile. Let the bottom tile end where it may, because a cove base will cover any unevenness between the bottom course and the floor.

Then apply mastic to an area on the wall about 4 by 5-feet in size. Using a notched trowel, first work mastic onto the wall in a vertical pattern. Then work the trowel diagonally over the vertical pattern. This helps to eliminate excess mastic and to make sure the mastic is thoroughly applied to the entire surface.

Start placing the first course of tiles either from right to left or from left to right, whichever is most convenient for the particular job. The important factor is to watch the leveling line. Make sure the tiles are not “floating” on too much mastic. Press each tile firmly against the wall.

When a plumbing fixture or an electric socket is encountered, the tile should be cut and smoothed with a file so that it can be custom-fit to the wall. A coping saw is easily used on hard composition tiles. Tin snips are used for metal tile cutting.

COATED AND UNCOATED HARDBOARD

Wall-size panels with a hardboard base and factory finished by a coating, baked on, in a variety of colors, are applied in the same manner as unfinished hardboard. See the section on “Plywoods and Hardboards” for basic properties and details on how to handle, cut and fabricate hardboard panels.

Hardboard is also available uncoated for interior wall treatment. Two patterns are available—leather and tile-scored. Factory-finished panels with hardboard base are usually 3/8-inch thick. Allowances should be made in construction for this thickness. Standard sizes are usually 4-foot widths and lengths of 4, 6 and 8 feet. Smaller widths are available.

Figures 6-11 describe the procedure for applying hardboard sheets to walls.
IT'S HERE!

Amazing new G-E Textolite* MONOTOP plastics surfacing

COUNTER, BACKSPLASH, EDGE-TRIM — IN ONE MOLDED PIECE!

Monotop surfacing is the biggest news in kitchen equipment in years! It’s a streamlined, super-sanitary beauty for the kitchen—from backsplash to curved front edge—in one molded piece of G-E Textolite plastics surfacing. Monotop is easier to install, too, because there’s no fitting of pieces, no metal trim needed. Available in five beautiful colors in the “Cross Current” pattern (exclusive with General Electric), Monotop surfacing is ideal for bathroom vanities! For full information on Monotop, and the full line of G-E Textolite plastics surfacing, contact your fabricator or write to General Electric Company, Section O-3, Chemical Division, Pittsfield, Mass.


You can put your confidence in—

GENERAL ELECTRIC

APRIL 1952
SURE OF PROFITS!
Prestile provides you with a complete line. And Prestile is priced right too, right for your customers—right for you!

SURE OF QUALITY!
Prestile’s beauty is baked in. It’s tough, durable, non-chipping—lasting beauty that creates satisfied customers.

SURE OF SERVICE!
Complete stocks and prompt delivery enable you to fill Prestile orders in every size, pattern and color.

From every standpoint, it pays to push Prestile!

HOW TO INSTALL PLASTIC WALL TILE

FIG. 12—First step is to measure off leveling point and to square and plumb all corners

FIG. 13—Mastic is applied to the wall first in a vertical and then in diagonal pattern

FIG. 14—Noting level line, first tile is laid

FIG. 15—First course sets line for rest of wall

FIG. 16—How the tile is set around sockets

FIG. 17—When all of the tile is interlocked in position, feature strip is then applied

FIG. 18—Final step is the applying of cove base

METAL TILE

Metal tiles come with a wide variety of baked enamel finishes and are of a flexible nature permitting the bending of tiles for interior or exterior use.

(Continued from page 274)
THE HI-BAKED PLASTIC ENAMEL SURFACE WITH THE NEW CONTOUR BEVEL SCORE LINES

for Beauty, Permanence, Economy

GREATEST
EYE APPEAL
LIFETIME
PERMANENCE
GREATEST
BUY APPEAL
EASIEST
CLEANABILITY

For full details, prices, discounts, write for our Catalog

TYLAC . . . Exact 4¼” squares and ½” mortar joints give ceramic tile effect. Has 2 plain and 2 scored edges. No costly joint mouldings needed.

MURALAC . . . Groups of 3 parallel lines at 16” intervals add distinctive design to a plain mirrored surface. A beautiful modern home wall pattern.

STREAMLINE TYLAC . . . Rythmic beauty in parallel scorelines spaced 2 3/16” apart on the center. An interesting border or a modern all-over wall treatment.

TYLITE . . . Modern trend architecture demands this plain, lustrous surface. Popular for upper-wall areas above wainscot of other colors and designs.

Here are a few of the Superior Features:

- TOUGHER
- MORE RESILIENT
- MORE FLEXIBLE
- HIGHER GLOSS
- BETTER ADHESION
- HIGHER RESISTANCE TO MOISTURE
- LONGER LIFE
- LONGER SERVICEABILITY
- HIGHER RESISTANCE TO HOUSEHOLD ACIDS

Standard Stock Sizes: 48” x 48” - 48” x 60” - 48” x 72” - 48” x 96”

TYLAC COMPANY MONTICELLO, ILLINOIS
PIONEERS IN THE PREFINISHED WALL PANEL INDUSTRY

APRIL 1952
You can't make a profit on an unsold house

ARBORITE creates the kitchen every woman wants — helps you sell your houses faster

"Let's look at the kitchen." You've heard that phrase countless times from the woman considering making your house her home. And you'll get her name on the dotted line faster when you show her just what she wants . . . a pleasant, conveniently arranged kitchen featuring sparkling, easy-to-work-in, and easy-to-clean ARBORITE on countertops and walls.

ARBORITE gives YOU trouble-free, labor-saving, on-the-job installation

You get ARBORITE in light, builder size panels 4' x 8' and 2'6" x 8' which are easily applied with little waste. Mastic adhesives and standard trim moldings hold it firmly in place. In fact, with ARBORITE you don't have any of the costly troublesome installation problems common to conventional pre-finished Plastic Surfacing Material. Your own carpenters can easily install it.

Double-thick MELAMINE Surface adds years of wear

ARBORITE's double-thick melamine surface resists abrasive wear, boiling water, acids, alkalis, and moisture, the banging of pots and pans. It's cigarette-proof! The colors stay bright for years.

available in 30 distinctive colors and patterns

write for FREE four color folder on Arborite and its uses.

J. A. DAVIES & COMPANY
314 STRAIGHT AVENUE, S. W.
GRAND RAPIDS 3, MICHIGAN

SETTING PORCELAIN-ON-STEEL WALL TILE

FIG. 19—Grout-adhesive is applied to the foundation board with a plasterer's trowel. This fills grooves and leaves a thin film on the raised surfaces

FIG. 20—Tiles are pressed into the grooves of the foundation board

FIG. 21—Excess adhesive is removed and the joints are pointed with a finger. The tiles are then cleaned with a sponge dampened with water or mineral spirits

(Continued on page 278)
FULL SIZE TILE
Size: 4¼" x 4¼"
Pieces per Carton: 200 (25 sq. ft.)
Weight per Carton: 11 lbs.

HALF TILE
Size: 2¼" x 4¼"
Pieces per Carton: 144 (48 lin. ft.)
Weight per Carton: 3 lbs.

FEATURE STRIP
Size: 1/2" x 4¼"
Pieces per Carton: 396 (132 lin. ft.)
Weight per Carton: 3 lbs.

INSIDE CORNER
Size: 4½ ft. strip
Pieces per Carton: 6 (27 lin. ft.)
Weight per Carton: 2 lbs.

OUTSIDE CORNER
Size: 4½ ft. strip
Pieces per Carton: 6 (27 lin. ft.)
Weight per Carton: 2 lbs.

COVE BASE
Size: 3½" x 4¼"
Pieces per Carton: 72 (24 lin. ft.)
Weight per Carton: 3½ lbs.

For easy extra sales and plus profits... carry Pittsburgh INTERLOCK Plastic Wall Tile!

WINNER OF THE 1952 FASHION ACADEMY GOLD MEDAL AWARD

JONES & BROWN, INC.
National Distributors
439 Sixth Ave. • Pittsburgh 19, Pa.
GLASS PANELS

Recommended thicknesses of glass panels for bathroom and kitchen wall treatment are 1/4 and 1/2 inches. Weight is approximately 4 1/2 pounds per square foot of 1/4-inch thickness. Glass panels may be installed over any hard, firm wall surface which is of true plane, plumb and straight. A bond coat should be painted on the wall surface to get good mastic adhesion. An allowance of 3/4-inch should be allowed for setting behind the glass panel. Mastic is applied in gobbs on the reverse side of the panel. Five gobbs would be about right for an 8 by 12-inch plate. Sufficient mastic should be used to insure that at least 50 per cent of the total area of the glass panel is bonded to the backing. Three-eighths of an inch should be allowed for setting behind the glass panel.

MASTIC IS APPLIED IN GOBBS

FIG. 22—After tub has been leveled, place roll of mastic around rim for waterproofing. Also, hatter studs with mastic before setting glass panels.

FIG. 23—Set the plate at the back of the tub first. Then merely nail through plasterboard flanges and use the special clips supplied for this type of installation.

FIG. 24—Do the same with the end panels. Let plasterboard extend beyond tub to next stud. If wainscot is 48 inches high, follow the same sequence in setting around second course.

FIG. 25—Clean glass and fill joints carefully with compound. This assures a waterproof installation.

GLASS PLATES should be worked into position

INSTALLING GLASS PANELS AROUND A BATHTUB

UTILITY SURFACES

Clay tile, linoleum, hardboard, plastic, stainless steel, and glass form attractive and durable surface treatments for sink tops, table, cabinet and counter surfaces. The success of such installations depends almost entirely upon the quality of workmanship.

DECORATIVE MOULDING in aluminum fits all sink shapes.

Decorative moulding in aluminum fits all sink shapes. Ship in making the seams and edges tight and waterproof. Due to the fact that there are so many types of sink pans and metal or plastic trims available, each installation must be considered separately. It is advisable on many sink-top installations to flush the surface mastic into the wall to avoid lipping and backup.
THE PRE-FINISHED SURFACING MATERIAL
THAT’S DESIGNED FOR LIFE-TIME BEAUTY

If there’s anything that makes a woman fall in love with a new home, it’s a modern kitchen—a NEVAMAR kitchen. One look at a sparkling NEVAMAR surface tells a story of beauty, color and ease of cleaning that no amount of sales talk can match. NEVAMAR means an easier selling job for you—and a satisfied buyer who will always sing the praises of a far-sighted builder.

NEVAMAR is a hard, pre-finished surfacing material that has amazing resistance to wear—admits no dirt, grease or other foreign matter. It is designed for a lifetime of dependable service, keeps its beauty thru the years.

NEVAMAR is available now in a wide variety of colors and patterns, including beautiful wood grains. It is perfect for kitchens, bathrooms, clubrooms...for built-in fixtures, wall panels. Would you like to see a sample?

DISTRIBUTOR: THE NEVAMAR COMPANY, BALTIMORE-30, MARYLAND
The NATIONAL Plastic Products Company
Manufacturers of Nevamar Decorative and Industrial Laminates • SARAN FILAMENTS • Wyrene Molded Products
OLNEY, MARYLAND • NEW YORK, EMPIRE STATE BUILDING • LOS ANGELES, 2352 EAST 37TH STREET
Builders see new sales opportunity in General Electric Light Conditioning!

HOME builders who are Light Conditioning their homes find that it gives them a three-way sales advantage.

First, it offers customers easier, more comfortable seeing, with lighting that’s scientifically correct. Second, it shows off every feature of the home to its best advantage—flatters colors, makes the most of design, even makes small rooms seem larger. Third, because a Light Conditioned home looks its best at night, it makes evening sales hours more productive.

Based on scientific lighting recipes

Light conditioning means the right lamp bulbs in the right fixtures in the right locations to give the kind of lighting that experts agree is best. There are G-E Light Conditioning recipes for every room in the house. Two typical examples are shown at left.

G-E Light Conditioning recipe for living rooms. The wall-to-wall valance lighting adds a feeling of spaciousness to the room.

Typical Light Conditioning recipe built around a specific seeing task. It shows by actual measurement how to provide the right lighting for sewing.

G-E Light Conditioning recipe for living rooms. The wall-to-wall valance lighting adds a feeling of spaciousness to the room.

Gets favorable comments from builders

Reaction of builders who are using Light Conditioning is enthusiastic.

These comments are typical:

"Light Conditioning brought out the real beauty and individuality ... especially at night. From now on, I want my houses to be Light Conditioned all the way through. It's a real selling advantage."

"I noticed that Light Conditioning stopped the visitors to our home. In past years, frankly, nobody even looked at the lighting. Light Conditioning, especially lighted valances, will certainly be in the plans for my future homes."

Free Recipe Booklet

Learn how to Light Condition your homes. Write General Electric for full information and a free copy of the Light Conditioning Recipe Book. Lamp Division, General Electric, Nela Park, Cleveland 12, Ohio.

You can put your confidence in—

GENERAL ELECTRIC

280 AMERICAN BUILDER
LIGHTING DETAILS in this house conform to the scientifically planned light condition principles now being adopted by many builders in all sections of the country.

WIRING systems must be planned and installed to meet the maximum requirements of combined lighting and appliance operation. The basic objective is to provide an electrical system that insures safe operation, ample capacity and convenient use. The principal parts of the system are: (1) Service entrance; (2) distribution centers; (3) feeders; (4) branch circuits.

Service Entrance

The service entrance is that part of the wiring system that extends from the utility company's service drop, street main, or other source of supply, to the owner's service disconnect service. The disconnect device may be either a fused switch or a circuit breaker. Service entrance cables must be of sufficient size to carry the load connected to them. Codes show only minimum requirements and many well-designed wiring systems will dictate the use of cables larger than specified by code.

Utility Electrical Supply

Most utilities supply single phase current at either 115 volts, two-wire; or 115/230 volts, three-wire service (115 or 230 volts are nominal voltages and is meant to include voltages of 110 to 120 and 220 to 240). When possible, it is advisable to select a three-wire service. A 115/230 volts, three-
wire service has many advantages over two-wire, 115 volts service. By the addition of one wire to a two-wire entrance, the capacity of the service entrance has been doubled. The 115/230 volts service is a more versatile system since it provides the 115 volts for lighting purposes and the higher voltage for major appliances. The three-phase, four-wire system of 120/208 volts, available in some localities, is convenient for heavy power usages such as air-conditioning. Size of service entrance conductors is governed by the size of the house and the over-all electrical load. Service entrance conductors terminate at the service breaker or fused switch unit.

**Distribution Centers**

The fuse or circuit breaker provides protection against overloading the conductors. The distribution center contains the fuses or circuit breakers which protect the conductors to the outlets throughout the building. The distribution center should contain sufficient circuits to provide for the foreseeable electrical needs and a number of spare positions (20 per cent of circuits being used). In number, there should be one circuit for each five hundred square feet of usable floor area for lighting purposes, and one circuit for every 500 square feet of usable floor area for general purpose convenience outlets. Also a circuit for convenience outlets in the laundry; two circuits for kitchen and dining room appliances, and special circuits for attic fan, dishwasher, home freezer and room heater.

It is not a good practice to mix circuit breakers and fuses in the same system. Provisions should be made in the main distribution center for an electric range, a water heater, and a clothes dryer. In small buildings the distribution center is located immediately adjacent to the service entrance. In large homes it may be advisable to put distribution centers in various locations throughout the home. Under this system the main distribution located adjacent to the service entrance would contain feeder protective devices, and feeders would be installed to distribution centers in various sections of the home or building.

**Feeders**

Feeders are the conductors extending from the service equipment to distribution centers that contain the branch circuit protective devices. Feeder must be large enough to carry the load it supplies and should have additional capacity that will permit the adding of future load without damage to feeder.

**Branch Circuits**

A branch circuit is that part of the wiring system extending beyond the final overcurrent device protecting the circuit. The number of branch circuits required will vary with the size of the residence and the number of appliances.
Outlets and Switches

The majority of electrical devices used are the "plug-in" type. Therefore, outlets must be convenient. Each room has requirements for convenience outlets. If a convenience outlet is installed for each 12 feet of wall space and a convenience outlet for each section of wall three feet or more long, then a normal seven foot cord will reach a convenience outlet from any point in the room, within four feet of the wall.

In no room should all the convenience outlets be connected to the same circuit. A blown fuse or circuit breaker opening should never leave a room entirely without electrical service.

At least one lighting outlet should be installed in each room or accessible enclosed space of the house. This outlet may be a perimeter outlet for valance, cove or strip lighting. It may be a ceiling outlet.

Light and electrical device switches should be sufficient and convenient. Switches should be so located that there is a path of light from room to room. Locate switches on the lock side of the door and if switches are located in such a position that the light cannot be seen, then equip the switch with a pilot light, so that lights will not be left switched on.

When planning construction of a new building, make provision for telephone raceways and outlets.

Selecting Material

Selection of material will be governed somewhat by the local codes and the type of residence being built. The majority of homes are wired with one of the following types of material and the corresponding fittings: rigid conduit, metallic tubing, armored cable, non-metallic sheathed cable, service entrance cable, concealed knob and tube. Concealed knob and tube wiring is usually confined to small homes and is not permitted at all in many communities.

LIVING ROOM: The manner of lighting will determine how well the room is suited to its uses. Valance lighting makes a room bright and attractive. A valance runs the width of front window, over fireplace and side window, making the area a focal point in this arrangement. The valance is a "closed-top" type due to height of windows. A valance of this type may be made of lightweight wood or wallboard 8 to 10 inches wide, mounted 6 to 8 inches from the wall depending on the drapery arrangement. At right fluorescent tubes behind valance light up drapes and fireplace. This perimeter lighting is supplemented by a recessed down-light.

BEDROOM: A "reading-in-bed" light should not create an eye strain. A good reading light should be provided by a long fluorescent tube behind a valance or in a reflector mounted on the wall above the headboard. Height of reflector above mattress should be approximately 24 inches. Bed lamps on tables at both sides of bed or a pin-up type lamp over the headboard are other solutions. The valance design will provide soft, pleasant illumination and eliminate the blinding contrast of bright spots in a dark interior. Night lights located in convenient outlets are desirable in nurseries and sickrooms. Recessed dressing table niche lends itself to overhead concealed illumination. Soft white fluorescent tube is installed behind an overhead cornice. A silver-half bulb could also be used for this lighting effect. This lighting is combined with "certified" boudoir lamps for the best results. General illumination for the bedroom is provided by an enlarged "bent" glass ceiling unit. Without this general lighting, the lounge chair lamp, the dressing table lighting combination, and other lamps stand out as bright areas of light, destroying the effect of a background of soft lighting.

Lighting

Lighting is an important consideration while the design of the home is in the blueprint stage. The placement of lighting sources where particular functions are being performed may satisfy a lighting problem in quantity but not quality. Provisions should be made for flexible schemes to prevent excessive contrasts of brightness for good visibility and eye comfort. Architects and designers realize the value of lighting as a medium of design and are using it for decorative purposes as well as utility.

One of the strongest selling features of a new home is often its kitchen. Modern equipment and well-planned designs frequently influence the decisions of buyers who are looking for time and effort-saving advantages in their new homes.

Growing public interest in still another modern, energy-saving kitchen aid. Light Conditioning, where lighting equipment is chosen and installed according to new tested recipes, offers the builder new opportunities to increase salability with a minimum of effort and expense.

Present widespread public interest in Light Conditioning has aroused many builders to include these advantages of modern lighting techniques in their demonstration homes.

In surveys based on visitors' preference, ballots solicited at builders' demonstration showings in both Dayton and Cleveland, Ohio. Light Conditioned kitchens were out-ranked only by lighted valances in living-dining room areas.

As one builder observed, once people have seen and experienced a Light Conditioned kitchen, they realize that this is one of the advantages they can't afford to overlook in choosing a home.

To create a bright, efficient, streamlined Light Conditioned kitchen, lighting must be functionally arranged to assure desirable amounts of light needed for kitchen tasks.
Few aspects of home planning and modern home equipment equal the interest in the function of the modern kitchen, its layout possibilities, and the effectiveness of its equipment.

In the development of the modern kitchen many measurements have been made, and inconsistencies, such as differences in counter and range top heights have been resolved. Step-saving studies have resulted in more efficient kitchen arrangements. Cupboard space over seven feet high seems to be disappearing.

Kitchen lighting, too, can be measured. Such measurements are needed if the true purpose of the lighting, its functional effectiveness, is to be appraised.

To give the builder practical guidance in selection of lighting equipment and its correct placement, a series of new lighting recipes were developed recently in the Lighting Laboratories at Nela Park. Four pretested recipes for the kitchen serve as a guide to the builder in creating a Light Conditioned kitchen.

These four recipes offer a choice of equipment including both filament and the new types of fluorescent units. They are based on various duties which must be performed in the kitchen by the homemaker. Light Conditioning a kitchen must begin with the plans in order to provide light at major work areas—the sink, the range and every important work counter, as well as a ceiling fixture. Either filament or fluorescent may be used, with the following as suggestions for minimum sizes that will give recommended amounts of light for average size rooms.

**THE KITCHEN** is one of the most important work areas to be lighted in a house. All work surfaces should have a shadow-free high value of illumination. Furthermore, the use of tubes in covers, troughs or behind concealed strips injects a newness in workshops of the home that even a coat of paint could not have attained. The central lighting fixture will give general illumination, but additional light is necessary over sink, stove, or work surfaces. In the modern kitchen, as in no other part of the home, is found a variety of electrical appliances, wiring devices and electrical outlets. Consequently, more fluorescent lighting has been used in kitchens than in any other room. Good utilization of the long, slender characteristics of fluorescent lighting is evident in this planned kitchen. According to recent surveys, better than seven per cent of the nation's kitchens are lighted today by fluorescent tubes, and over 65 per cent of the women questioned expressed a preference for this type of lighting. Located over the sink is a recessed fluorescent reflector with glass cover and using two 20-watt fluorescent tubes. Additional fluorescent or incandescent lamps are placed beneath the cabinets, giving high levels of illumination of the working counters. Although the breakfast room is partially separated from the kitchen, a pendant type incandescent fixture is recommended. The lighting that results is a well-diffused table illumination with softly shaded light in the rest of the area. This room could also have an alternate lighting system consisting of a recessed incandescent spot located directly over the table. Combining the incandescent of the breakfast room with fluorescent in the kitchen will create a related mood.

**LAUNDRIES** can be light, pleasant work areas. Simple lighting units located over working areas for good visibility will appeal to most women. The lighting in this laundry will make tasks easier, increase efficiency and reduce nervous fatigue usually associated with washing. It will also bring out search marks so often unseen until the article is used under daylight. Ironing scores, burns and spots are readily detected under light from the daylight fluorescent lamp. Good lighting, therefore, becomes a gain and an economy when used in laundries. Generous amounts of light are provided by using an industrial type two-lamp fluorescent reflector (two 40-watt daylight tubes) in the ceiling. Additional fluorescent tubes are located under the cabinets for illuminating the tub and washing machine area. Well-planned laundries, such as this one, are important features in the new houses of today.

**Central Ceiling Fixture**

Fluorescent Ceiling Fixtures—three 20-watt or two 25-watt lamps. Incandescent Ceiling Fixtures—minimum 12-inch glass enclosing globe with 150-watt standard bulb.

In addition to generous ceiling light needed to see into tops of cupboards and bottoms of drawers. Light Conditioning requires special light over the sink to prevent working in one's own shadow.

**Sink Lighting**

Fluorescent surface units using two 25-watt tubes may be used unshielded in room corners. Sinks are flanked by cabinets (none above) so that tubes can be concealed from view, as shown here. This unit should be mounted as close to the valance board as possible. Decorative valences between the cabinets to protect eyes from direct glare should extend down at least seven inches, as shown.

An alternate sink lighting arrangement using filament type fixtures includes a 75-watt reflector flood bulb in a porcelain socket or a 150-watt standard lamp bulb in a 12-inch enclosing globe.

All three types of fixtures should be attached to the ceiling so that they are centered above the sink. When ranges are flanked by cabinets (with none over range) they may be lighted with this same type of installation.

**Range Light**

Another requirement of a Light Conditioned kitchen is special lighting at the range to enable homemakers to see into bottoms of pots and pans while cooking. One method of range lighting that has proven popular with builders when cabinets are located above the range is to use a commercially available fluorescent wall fixture.

This shielded fluorescent unit has one 25-watt or 40-
AN APPEALING decorative note in the recreation area is made by underlining the modern lighting with a wise choice of furniture against a background of soft colors. This room suggests the possibilities in lighting effects and usefulness as an informal living area. It can serve as a playground for children with plenty of light for their games. As a playground for adults it is colorful, festive and attractive. The lighting was designed for all activities that reasonably may take place within the recreation area. Simple down-lights flood the bar area, the card table or reading group. Valance lighting serves a dual purpose. It throws an indirect soft light to the ceiling, making it attractive and bright, and also provides well-distributed light over pictures, mirrors or draperies. It further provides good reading light for those seated on the divan. Ornaments, bottles or knickknacks located on glass shelves in the back bar take on new life when lighted. Slim tubes of fluorescent or lumiline produce a warm glow emphasizing the color of the objects.

A 25-watt tube, as pictured above. A shielded unit with two 60-watt lumiline (long filament) tubes end to end, or a shielded unit for two 60-watt frosted bulbs spaced 18 inches apart with lamps mounted parallel to the wall should be used over ranges.

To assure light across the whole range top, wiring outlets for range lights should be located at 51 inches from the floor. When this is not possible, they may be located 21/4 inches below bottom edge of upper cabinet. If rectangular outlet boxes are placed horizontally, it will be possible to use narrower fixtures than when they are placed vertically.

Another practical and popular way builders can provide light for the range is by constructing an attractive shelf with fluorescent lighting concealed in it. This shelf light which is equipped with a glass top, lights not only the range top but gives the homemaker a convenient space for cooking and decorative accessories. The shelf uses a 40-watt fluorescent tube. Its design is simple enough so that it can be constructed on the job.

Wall type fixtures may also be used in this same position to light sinks with cabinets located directly above them.

Work Counters

In addition to a central ceiling light, a range light and light over the sink, local light should be provided for each 25 to 30 inch length of work counter.

A 20-watt fluorescent unit may be used unshielded if placed under cabinets. When, however, the unshielded light may be seen when seated in an adjoining breakfast nook or dining area, they must be shielded.

One of the advantages of Light Conditioning that most impresses builders is that Light Conditioning can show up the fine features and detail of the interior.
UNIT HEATERS

Horizontal Type
Vertiflow Type
Cabinet Type

COILS

Cooling Coils
Heating Coils

AIR CONDITIONING UNITS

Horizontal Type
"YAC" Unit

Vertical Type
"YAC" Unit

YOUNG
YOUNG RADIATOR COMPANY
DEPT. 702-D, RACINE, WISCONSIN
Factories at Racine, Wisconsin and Mattoon, Illinois
Sales and Engineering Offices in All Principal Cities

286

AMERICAN BUILDER
FUEL bills are an inevitable part of home owning and with oil possibly subject to rationing, coal more and more expensive, and gas in short supply in some areas, some people are wondering about electric heating, heat pumps, and even atomic heating plants. Most of these newer developments are still for the future, and the majority of new homes built in coming years will be heated with the regularly available fuels. There is much that the builder and architect can do, however, to see that fuels are used efficiently.

Heating Principles

The builder and architect should be responsible for providing the following items:

1. A good chimney or vent pipe for the control of combustion and exhaustion of flue gases.
2. A safe structure protected from fire hazards.
3. A tight structure to minimize heat loss.
4. A durable structure protected against moisture condensation.
5. A comfortable building with a minimum of drafts and cold surfaces.

Research work has indicated conclusively that emphasis on heating equipment alone is not enough—more attention must be paid to the structure itself to insure comfort.

Good Chimney Is Mandatory

The first point to consider in chimney construction is adequate flue area. The quantity of smoke and gas to be removed will depend on (a) the kind of fuel and (b) the amount of fuel needed to heat the house. Flues built for oil and gas burners will not need as large flue dimensions as those which serve furnaces that burn coal. In an area where hand-fired bituminous coal may be burned in a central heating plant, the nominal chimney flue dimensions should never be less than 8 inches by 12 inches.

The height of the furnace flue is also important, and for some furnaces must provide strong enough suction to draw air into the combustion space and up through the bed of ash and fuel; for others, the chimney will only need to supply necessary draft to remove the flue gases from the furnace.

The preferred location for chimneys is in the interior of the house. Inside chimneys are not so subject to backdrafts, to moisture condensation, or to smoke backing into the house. The preferred height is not less than 8 feet from the top of the smoke
A GOOD CHIMNEY IS NECESSARY FOR ANY SYSTEM

Top of chimney at least 2½ feet above ridge.

Flue should be straight, without offsets.

A lined flue of large cross section area is desirable.

(Courtesy of Small Homes Council, University of Illinois).

pipe connection of the furnace. If the flue must be offset, the angle of the offset should never be more than 30 degrees. Flue lining joints must be perfectly smooth and tight.

Prefabricated chimney units are available today which can be used in place of lined brick construction. Light in weight, they save on installation time and labor, claim savings of up to 50 per cent over brick construction. One type has an insulating wall equivalent to 24 inches of brick. Such chimneys are easily installed, are designed for one- or two-story construction and for use with all fuels.

They can be suspended from the ceiling, the floor, or installed with pier support. Flue sections are lined with refractory fire clay, come with joint cement and draw bands for cementing the sections together. Roof housing is easily fitted to exact roof pitches. These packaged chimneys are accepted by FHA and national heating codes and have fire-safe ratings from Underwriters' Laboratories.

Fire Hazards

Should Be Eliminated

Some of the more common fire hazards over which the builder has some control (but the heating contractor very little) are:

1. Chimneys and pipes accumulate soot from soft coal. If chimneys "burn out" and soot catches fire, a danger spot exists if any combustible material touches the chimney, such as roofing or framing.

2. Specifications exist for clearance between smoke and vent pipes and adjacent combustibles such as joists or partitions. Protect such surfaces.

3. Smoke pipes should be short and well supported, so as not to serve as soot collectors. Fit sections together with screws and hang securely. Build to withstand any puffback short of an explosion. If the smoke pipe is long and has bends, it needs periodic cleaning.

4. Thermostatic controls are primarily designed for temperature control for comfort. However, limit controls exist which can guard against excessively hot temperatures and will stop the stoker or gas burner or oil burner whenever safe tempera-

“CONDENSED METHOD” HEAT LOSS FACTORS

Quantities of heat are measured in units called British Thermal Units (abbreviated BTU). Heat is lost from a warm building through all of its surfaces exposed to lower temperature. This is called "transmission losses." Heat is also lost due to wind blowing through cracks around windows and doors. This is called "infiltration losses." Total heat loss of a building is the sum of transmission losses plus infiltration losses.

A. The first step is to find how much heat is lost by transmission. Calculate the areas in square feet of all exposed surfaces of the room or building including:

1. Window and outside door area (combined).
2. Net outside wall (gross wall area minus item 1).
3. Ceiling area (below unheated room or attic space).
4. Inside walls adjacent unheated rooms.
5. Floor area (if space below floor is not heated). Each of the above areas should then be multiplied by the proper factor from one of the Condensed Method tables.

B. Next, estimate infiltration losses. This depends on the amount of cold air blown into the house, which in turn depends on the size of the window or door and the width of the crack around it. Simply multiply the area of windows and doors already calculated in Step A by the infiltration factor selected from Table 5.

C. Add the infiltration losses (Step B); and the transmission losses through the windows, walls, etc. (Step A) all together. The sum is the heat that would be lost from the room or building—if the temperature difference between inside and outside were 100°. In other words, this is the amount of heat it takes to maintain 70° inside when the outside temperature is 30° below zero, which would occur only in the very coldest sections of the United States.

D. Heating requirements are naturally less where the weather does not get so cold. The average minimum temperature in Dallas, Texas, for example, is only 10° above zero. The "design temperature difference" between inside and outside would be 70° minus 10° equals 60°. Therefore, the heating requirement is only 60/100 or 60% of the amount based on 100° TD. The map at the right is sized according to winter design temperatures, and gives percentages by which results from Step C should be multiplied to find actual heating requirements.

HOW TO USE THE CONDENSED METHOD

HEAT LOSS FACTORS

1. WINDOWS & DOORS
   Multiply sq. ft. by:
   a. Without storm sash
   b. With storm sash

2. OUTSIDE WALLS (NET)
   Multiply sq. ft. by:
   a. SOLID MASONRY — (Brick, stone, etc.) with plaster applied direct to inside surface of masonry wall.
   b. AVERAGE FRAME — Brick veneer—Wood siding—Shingles or Stucco—With sheathing, building paper, studs, lath and plaster
   c. HEAVILY INSULATED — Same as 2b with 2" or more insulation

3. CEILINGS & INSIDE WALLS
   Multiply sq. ft. by:
   a. CEILING — Plaster on lath or wallboard. No floor above — Attic not vented
   b. Same as 3a — with 2" or more insulation
   c. CEILING of first floor room below unheated room on second floor
   d. INSIDE WALL adjacent unheated room

4. FLOORS
   Multiply sq. ft. by:
   a. Double wood floor — over cool basement or other enclosed space
   b. Same as 4a — but open space below floor was exposed to outside

5. INFILTRATION
   Multiply each sq. ft. of window and door area by:
   a. WINDOWS AND DOORS
   Average fit — Not weatherstripped
   b. Average fit — weatherstripped (or equipped with storm sash)
   c. Poor fit — not weatherstripped
   d. Poor fit — Weatherstripped (or equipped with storm sash)
   e. EXTRA FOR EACH OUTSIDE DOOR
   f. EXTRA for air lost up fireplace chase

*Above factors are approximate heat loss through each sq. ft. of surface with 70° inside and 30° outside.
turers for furnace or boiler are exceeded. Safety should always precede comfort!

Weatherproofing Saves Fuel

In remodeling an existing house, the following weatherproofing steps should be taken: (1) installation of storm doors and weather-stripping outside doors; (2) installation of storm sash, especially living room, dining room and sunroom areas; (3) insulation of ceilings; (4) insulation of sidewalls. (Listed last because most expensive.)

With new house construction, these steps are taken in reverse order. The minimum requirements for FHA-mortgaged homes list the minimum values for transmission of heat for walls and ceilings. These are bare minimums and should not be considered desirable. In any case check over your plans with the heating contractor and let him specify allowable heat loss from each room so that provision can be made for necessary weatherproofing to provide comfort without putting unnecessary strains on the heating system.

Protect Against Condensation

Vapor barriers are available which will eliminate the possibility of moisture condensation in the walls. These

Weatherstrip. Heat vestibules above normal room temperatures.
(3) Baseboard drafts. Fill stud spaces in attic with insulation to prevent cold air coming down.
(4) Basements—leaky sills, leaking windows. Weatherstrip and caulk tightly. Cold basements make cool floors overhead.
(6) Drafts due to cold room surfaces, especially large window areas. Insulate cold walls and apply storm sash to windows.

Some Modern Types

Gravity Warm Air Heating

Gravity warm air heating is usually the cheapest to install, although the addition of controls can raise the initial cost. The best place for chimneys with this system is near the center of the building to avoid long smoke pipes subject to soot. Install wall stack and given upward grade of one inch per lineal foot. They

1. Combustible material must be kept away from the smoke pipe. Do not store things near it.
2. The smoke or vent pipe may be sheet metal, cement-asbestos, or porcelain enameled pipe. If sheet metal is used, it should be 24 gauge or heavier. (24 gauge is almost 1/32 inch.) The other materials should be listed by the Underwriters' Laboratories, Inc.
3. The size of the smoke or vent pipe should be equal to the size of the connection at the fuel-burning equipment.
4. The connection to the chimney should be as short and straight as possible.
5. All joints and seams should be sealed and gas-tight, and must be fastened securely, so any expansion or "puffing" will not loosen the pipe.
6. A draft hood is required as standard equipment for gas-fired devices.
7. Automatic or barometric dampers are recommended for use with stokers and oil burners and have been successful in installations where coal is hand-fired.
8. A crown damper should not be used with a draft hood or a barometric damper. If it is used (usually only on hand-fired coal installations), it must be between the heater and the check damper.

( Courtesy of Small Homes Council, University of Illinois.)

( Courtesy of Small Homes Council, University of Illinois.)

SMOKE PIPE OR VENT PIPE CONNECTIONS

to the chimney should conform to the standards shown on this page. They are minimum standards for safe and efficient operation of fuel-burning equipment and are based on the requirements of the National Fire Protection Association and the National Board of Fire Underwriter.

SMOKE PIPE OR VENT PIPE CLEARANCES REQUIRED FOR SAFETY

(See "A" in drawing above.)

1. Combustible material must be kept away from the smoke pipe. Do not store things near it.
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( Courtesy of Small Homes Council, University of Illinois.)

SMOKE PIPE OR VENT PIPE CLEARANCES REQUIRED FOR SAFETY

(See "A" in drawing above.)

1. Combustible material must be kept away from the smoke pipe. Do not store things near it.
2. The smoke or vent pipe may be sheet metal, cement-asbestos, or porcelain enameled pipe. If sheet metal is used, it should be 24 gauge or heavier. (24 gauge is almost 1/32 inch.) The other materials should be listed by the Underwriters' Laboratories, Inc.
3. The size of the smoke or vent pipe should be equal to the size of the connection at the fuel-burning equipment.
4. The connection to the chimney should be as short and straight as possible.
5. All joints and seams should be sealed and gas-tight, and must be fastened securely, so any expansion or "puffing" will not loosen the pipe.
6. A draft hood is required as standard equipment for gas-fired devices.
7. Automatic or barometric dampers are recommended for use with stokers and oil burners and have been successful in installations where coal is hand-fired.
8. A crown damper should not be used with a draft hood or a barometric damper. If it is used (usually only on hand-fired coal installations), it must be between the heater and the check damper.

( Courtesy of Small Homes Council, University of Illinois.)

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Basic Principles of forced warm air heating systems are illustrated in this schematic drawing. Blower draws air through heating chamber from where it is distributed to rooms in structure.

**Forced Warm Air Heating**

The forced warm air heating system is a warm air heating system in which air circulation is effected by means of a motor-driven fan rather than by the difference in weight between heated air leaving the boiler and cool air entering the bottom of the furnace, as is the case with gravity warm air installations. One great advantage of forced warm air is the possibility of locating the furnace in attics, utility rooms, or other out-of-the-way spots.

Furnaces for forced warm air systems vary in construction with the fuel selected. Bituminous coal requires a large combustion chamber. In burning oil, the correct size of combustion space is necessary with a long fire travel and extensive heating surface. Gas-burning units should have low flue resistance so that non-combustible gases will vent off readily. Select a unit which will have readily available spare parts and repair service.

A good humidifier is essential to maintain sufficient moisture in the air for comfort. Automatic humidifiers are usually supplied as standard equipment.

Filters in warm air heating are also essential to remove lint and dust which would otherwise be deposited on walls and furnishings. Air distribution in a room greatly affects comfort. The type of register used, its location, type and location of return grilles must all be considered. Baseboard registers can be used with recommended maximum velocity of 300 feet per minute, while wall registers 18 inches below ceiling should have 500 feet per minute velocity minimum except in bathrooms. Where distance from register to opposite wall is over 15 feet, higher velocities are recommended.

Automatic controls are essential for proper operation of forced warm air systems. Without them, air stratification, high bonnet temperatures, heat overrun or lag or excessive temperatures will usually result. Tests indicate that continuous fan operation provides the best operating results. Controls for most units should include a thermostat located in a room where maximum temperature fluctuation exists, an adjustable furnace switch if desired to start and stop fan, an ignition control, and safety devices to prevent overheating and operate any necessary vents. Zone control on large installations is advisable.

**One-Pipe Steam Heating**

Many changes have taken place in the one-pipe steam heating system. It has been streamlined and redesigned to use modern boilers with impact convectors and accessories.

A modern boiler is specifically designed for the type of fuel which is to be burned.

Modern radiator design of the thin tube type is a free standing unit and may be enclosed or recessed. The sun-type of cast iron radiator is enclosed within itself and produces a fair amount of radiant heat as well as heat by convection. Convector radiators are the most popular, and can be equipped with dampers in their enclosures to regulate the flow of warm air from the unit. Note that the only way to regulate heat from individual radiators in one-pipe steam is either with dampers and convector type radiators, or to have radiators either fully on or off to prevent ponding or filling up with water.

Automatic air valves and quick vents are probably the most essential equipment used with one-pipe steam systems, particularly the vacuum types which prevent the return of air to the heating system once it is expelled.

Insulating covers should be applied to all piping so that heat will be retained in the pipes and hold heat loss to a minimum.

Owners are advised to heat their boilers all the year round to avoid boiler deterioration, and also to heat hot water economically by using an indirect water heater installed below the boiler water line.

When properly engineered, one-pipe steam systems will operate efficiently and provide suitable room comfort.

**One-Pipe Hot Water Heating**

One of the best systems in use, hot water heating has always cost more to install than most other types, but makes up for it in long life and few repairs. In the long run it is economical. The old bulky systems have been replaced with streamlined versions, with efficient boilers, small radiators and convectors, small pipes, and a circulator or booster pump to force circulation and provide heat.

With hot water, it is possible to control the heat in each individual room. In addition, the advent of forced circulation, using electrically-powered pumps to force the flow rather than burning extra fuel, has made possible very economical operation.

While each room can be controlled individually, it is necessary for the (Continued on page 292)
Here's a new and wanted addition to Richmond's line of winter air conditioners... giving you a still wider selection of quality heating units.

Here's a unit built to fit easily into homes where space is tight... ideal for restricted space use in utility closet installations.

Here's a competitively priced, thrifty-to-run unit that more than meets today's demand for low-cost heating... without sacrificing quality.

Here's the new SU-P in its handsome jacket... made of sturdy steel, finished in light green Hammertone baked enamel. Note the heat exchanger... made of 12 gauge steel... welded for durability and efficiency. Use the handy coupon to get full information—fast.

Remember—when quality and economy count, count on Richmond.
ONE-PIPE HOT WATER SYSTEM operates with thermostat which activates small motor-driven booster pump to force water from boiler to room radiators

(Continued from page 290)

floor furnaces

Floor Furnaces

The simplicity of floor furnaces has many virtues, chief of which is low installation cost. No ducts are required. The furnace needs no basement, uses no living space in any room. It requires very little skilled labor to install. Single units usually have sufficient capacity to heat four or five rooms in a small house.

Two-story buildings usually cannot utilize a floor furnace system because the furnace is hung below the floor, and homes with basements will need an additional heater for the basement, as only the cold air returning to the furnace touches the unit’s outer jacket.

A good floor furnace will circulate all the air in the heated space three to five times an hour without excessive velocities or drafts. The unit itself usually consists of a combustion chamber together with interior radiator sections to provide maximum heat transfer surface, all enclosed in a metal inner liner. Space between inner liner and outer jacket provides for cold air return to bottom of the unit.

Gas is the most popular fuel, although oil is used successfully, and bottled gas in locations where gas cannot be piped into the building. Floor furnaces are usually equipped with automatic controls and safety devices to shut off fuel, should the pilot burner on gas units fail. All units should be located as closely as possible to the chimney to provide short ventpipes and adequate drafts for combustion.

Floor furnaces can be made automatic, are efficient, and will provide clean and economical heat at a satisfactory degree of comfort. Low initial cost adds to the desirability of the system.

Radiant Heating

Radiant heat rays move from a warmer to a cooler object, and upon coming in contact with a solid surface are either absorbed or reflected. Absorbed heat rays heat the solid
Hydro-Flo Heating, of course

with modern baseboard heating panels

For comfort, the areas around large, low windows must be adequately heated... and a B & G Hydro-Flo Forced Hot Water System with baseboard heating panels is an ideal way to do the job. Baseboard panels fit neatly under low windows... raise a blanket of warmth against incoming cold... keep room temperature virtually uniform from floor to ceiling.

Heated water circulated through the baseboards by a B & G Booster is automatically controlled so that the heat supply is always matched to the weather! No wasteful overheating—even in spring and fall, when only a little heat is needed.

Plenty of hot water, too, for automatic washers, baths and showers. The Water Heater of a B & G Hydro-Flo System furnishes an ample volume, winter and summer. Send for catalog of B & G Hydro-Flo Heating Products.
A TYPICAL sinuous radiant heating coil of ¾-inch copper tube on 3-inch centers (continued from page 292)

Radiant heat is important because the problem of comfort is not one of room temperature, but rather of body heat and how it is lost and at what rate. Thus, if the surrounding surfaces in a building are heated, radiant heat loss from the human body will be controlled, and it is possible to set up conditions of comfort with temperatures as low as 60 degrees F. The result is more efficient heating at lower fuel cost.

**Radiant Heating With Hot Water**

Radiant heating with hot water can be accomplished with either floor or ceiling panels. “Panel” refers to the heated portion of room surface that serves as a heat source; “coil” refers to the piping embedded in the panel to convey the hot water.

The system is similar to closed hot water systems in that it requires a boiler, combustion chamber for coal, oil, or gas, compression tank to take care of the expansion of the water when it is heated, an air-trol to eliminate unwanted air in the system, a pressure-reducing valve, a relief valve, and a booster pump.

Radiant heating with hot water, however, keeps the panel at a relatively low temperature with a low rate of heat transfer and saving in fuel. The lower boiler temperatures required mean lower chimney and stack temperatures and fuel saved.

Dollar for dollar, installation costs of most radiant hot water heating systems are competitive with other types, the only added cost coming from the additional automatic controls usually needed to realize to the full the added benefits from radiant heating. These costs are absorbed in reduced operating costs in a few years.

An indoor-outdoor full-type of control system, plus room thermostat, has been found effective in maintaining comfort. In conventional heating systems, warmed air moves about the room, tending to rise towards ceilings with a differential in temperature between ceilings and floors; but with radiant heating, ceiling to floor variance is often as little as 2 degrees F.

Usually no additional provision for humidification of air is necessary, bathroom and cooking steam vapors sufficing. However, the radiant heating system itself cannot humidify or dehumidify the air.

Where coils go into ceilings, expanded metal lath is preferred for the plaster base, with the coil above the lath and attached to the joists. Where coils are below the plaster base, plastering time is usually tripled and much more plaster is required. Acoustical or other insulating tile should not be used for ceilings in which the coil is to be located. Panels installed in dead air space between floors are ineffective.

Insulation should be used to reduce heat flow in reverse directions to those desired. Where reflective insulation is used, the reflective surface should face the warm side but not be in contact with it; there should be an air space on both sides of the insulating material of at least ¾-inch. Vapor barriers under floor panels are essential.

Leaks and corrosion of pipes present no greater problem than in other “closed systems.” The choice of piping is unimportant from the standpoint of heat output, but per foot cost, plus installation cost, and labor must be considered. Size of pipe has little to do with heat output either, but definitely determines booster pump capacity required.

**Radiant Heating With Warm Air**

Radiant heating with warm air is accomplished with a closed system utilizing air instead of water but channeled through ducts from furnace-heating chamber and returning cooler air to the furnace, much as hot water is carried through the closed hot water systems.

It is assumed that air and water flow in much the same manner; consequently, with the first duct or tile channel supplied with warm air, the last to return to the furnace, grids or ducts are laid out to insure uniform air flow.

Most standard forced warm air furnaces can be used, except that filters and automatic humidifiers are unnecessary. Floor ducts can be tile, brick haffles, or other inexpensive materials. For economical and comfortable operation, systems should be designed for floor temperatures of 85 degrees F. maximum.

One important consideration is heat loss off the end of the slab. Insulation should be provided here as well as below the floor ducts to prevent heat loss and moisture and vapor accumulation.

Calculations necessary to install such a system include heat loss, furnace capacity temperatures and entering air temperature at channels, C.F.M. of blower and static head against which it is to discharge.

(continued on page 296)
This house should give you ideas

This is a Carrier Weathermaker Home created by Roy Carroll.
It shows you a number of ways in which Carrier Weathermaker Air Conditioning contributed to better house design.

It influenced the design
This Weathermaker Home contains more usable space per building dollar. That's possible because it makes functional use of its air conditioning. Because the new Weathermaker is specially designed for homes, it insures that the air you live in is healthful and comfortable, so the rooms have only one exposure. Only a few movable sash are required. The floor is a simple rectangle. Baths are placed in the interior.

It helped pay for itself
This Weathermaker Home makes air conditioning economical. The design makes the house less expensive to build. The design reduces the first cost of the air conditioning. An overhang over the south windows ... trees shading the roof ... help to reduce the cost of summer cooling. A solid wall to the north helps reduce the cost of winter heating.

It made a better home
This Weathermaker Home is a more convenient home. A windowless wall gains space for storage. Windows, doors and closets are placed to allow the greatest freedom in furniture arrangement. The living and dining areas are completely open and interlacing, while the sleeping areas are completely private. And, of course, the Weathermaker keeps the house far cleaner, far more quiet, and infinitely more comfortable. Of course, this is just one approach. There are many more. How would you do it?

The architects—Carroll, Grisdale & Van Alen is a well known Philadelphia firm whose recent work includes the South Study Center on Benjamin Franklin Parkway and the Terminal Building, Philadelphia International Airport (now in progress).

The Carrier Weathermaker
is designed for a duct system like that used for forced warm air heating. The Weathermaker cools and heats. It burns gas for heating ... uses a sealed electric refrigerating unit for cooling. It is only a little larger than an ordinary furnace.

AIR CONDITIONING • REFRIGERATION
For 50 years— the people who know air conditioning best

CARRIER CORPORATION
314 South Geddes Street, Syracuse, N. Y.

Please send me the story on the Weathermaker Air Conditioner and the Weathermaker Home.

Name
Street
City
State

APRIL 1952
SECTION DRAWING showing detail of floor construction and tile duct system. Although this floor is designed for tile, there are other common materials that may be used of the panel, thus heating by a combination of convection and radiation. Thermostats provide automatic operation.

Tests indicate that such units, properly installed, will operate efficiently, and can be used economically where the kilowatt rate is two cents or less. In houses heated by other means, individual panels can be useful for spot-heating of bathrooms and similar locations. They are also useful in commercial installations.

SUGGESTED METHOD of holding pipe in place when it is used to form duct in slab

(Continued from page 294)

Glass Wall Panels

One of the newer developments in radiant heating has been the use of glass wall panels. The units consist of rectangular glass panels ½ inches thick with an aluminum grid fused to the back of the glass. The glass is almost impossible to break. An aluminum reflector is placed between the glass panel and the back of the mounting frame. Electricity passing through the grid raises the temperature of grid and glass panel to as high as 340 degrees F. Temperature differentials cause air to circulate through vents at the top and bottom the sources of heat loss in the following manner:

1. Warm air rising from lower room levels nullifies the effect of ceiling loss.

2. The floor is warmed by ducts installed below the surface.

(Continued on page 298)
Your houses, regardless of style or cost, can offer Bundyweld ceiling radiant heating

One of the most exciting, sales-producing features you can put into your houses. Today’s finest heating — and tomorrow’s; low in cost, easy to install.

Sales points for your houses

With Bundyweld ceiling radiant heating, your houses feature the most even, clean, economical, and convenient heating of all. It cuts housekeeping chores by hours; cuts fuel bills to pieces; postpones wall washing, redecorating, and cleaning of furnishings for years.

Here’s heating that truly radiates — evenly, swiftly downward from the invisible ceiling system. Here’s heating that feels natural, fresh, invigorating — as thousands of home owners will tell you.

Easy, low-cost installation

With Bundyweld Tubing, a ceiling radiant heating system is a cinch to install at low cost. Standard 24’ lengths of lightweight, ductile Bundyweld (one end expanded when specified) are easily handled; quickly bent, joined, and mounted onto the ceiling; then easily plastered over. Low-cost Bundyweld saves you time and money on the job, gives finest radiant heating performance, too. Send coupon below for full details.

Send for your copy of handsome 20-page brochure that gives you meaty facts on Bundyweld ceiling radiant heating. (Bundy also offers this brochure to future home buyers via full-page, 4-color ads in Better Homes and Gardens and American Home.)
Waterproof membrane covers the area within foundations and extends on side to slab top.

All joints of waterproof membrane should be lapped and sealed with waterproof sealer.

Perimeter system with loop distribution. Feeder duct runs to "T" connection.

Reinforcing mesh in slab and over ducts adds strength to thin part of slab.

Concrete mix poured over membrane should be dry. Planking protects ducts when pouring.

(3) Warmth from mildly radiant floors and circulation of warm room air offsets loss of heat through outside walls and doors.

(4) A current of warm air rising vertically at window surfaces from grilles below them prevents normal downdraft of cold air (usually occurring at windows) from spreading across the room.

The National Warm Air Heating and Air Conditioning Association has prepared a series of definitions and descriptions of various types of perimeter warm air heating. These include:

**Crawl Space Duct System.** With a home built over a crawl space, the system is suspended from floor joists. Branches from furnace plenum or extended plenum end in registers placed below windows and along outside walls.

**Loop System.** For homes built on concrete slab set directly on the ground, warm air ducts embedded in the slab follow the outer wall of the building in a continuous loop supplied by feeders from the furnace plenum chamber. Registers are below windows. Floor surfaces radiate some heat also.

**Crawl Space Plenum System.** The entire crawl space is used as a warm air supply plenum. Stub ducts from furnace plenum chamber direct air currents to window registers.

**Radial System.** Houses with either crawl space or slab construction can use this system, which has individual ducts from furnace chamber reaching each window or wall register.

**Lateral System.** This layout places the furnace at one end of the building, in the center, with an extended main channel or duct running the length of the building down the middle. Every few feet, tile ducts branch off at right angles to both sides and conduct air to wall registers running the length of the building on both sides.

Careful slab floor construction is an integral part of the heating system. The site should be well drained. The finished slab surface should be not less than 6 inches from grade. Fill should be coarse material four inches deep, with waterproof membrane between fill and slab bottom and covering edges of slab. Two inches of insulation around the slab and between it and the foundation, are recommended, 14 inches deep, waterproofed and termite-proofed.

Conventional forced warm air furnaces and controls may be used, although basementless homes usually find the downflow type most satisfactory. Thermostat, limit control, fan switch, and burner control are necessary. Balancing the system is accomplished by means of sleeves inside ducts below registers at windows and walls. Baseboard and wall registers may also be controlled by friction dampers in the stackheads.

**Baseboard Heating**

Baseboard heating, which furnishes heat both by radiation and convection, can be installed as a complete system or as an adjunct to other heating devices. A high percentage of heat from baseboard panels is distributed by radiation, which reduces rising warm air currents and the wall-streaking common with ordinary radiators.

Baseboard panels can be used effectively with one-pipe hot water systems, two-pipe forced hot water, two-pipe gravity hot water, and two-pipe steam systems. They cannot be used with one-pipe steam systems because of venting and condensation problems.

One-pipe hot water systems using baseboard panels either use a conventional basement main or a series-loop system with the baseboards being part of the main. Control systems are the same as those for other hot water systems of heating.

Baseboard panels come in three basic types, each of which requires that substantial wall areas be well insulated wherever the panels are placed. Convectors types consist of finned tubing or pipe within a baseboard style metal shell. These may

**Cross section details of construction units for properly installed perimeter duct**

(Continued on page 200)
It's Good Business
to install a "Niteair" Fan in every home You Build!

and here's why:
1. "Niteair" Fans help you sell homes faster and more profitably.
2. "Niteair" Fans give you a substantial return on a minimum investment.
3. "Niteair" Fans give you the "complements-sell" that buyers have come to expect for years.
4. "Niteair" Fans add the "commercial-appeal" that buyers look for in today's homes.

This "Niteair" Rancher Fan appeals to home buyers!
quick to install!
fully guaranteed!

- The Complete, efficient "Package" unit.
- Four sizes: 24" - 30" - 36" and 42"
- Sealed Ball Bearings never need oiling
- Rubber-cushion mounted; quiet, vibration-free
- Designed for homes with Low-Pitched Roofs
- Inexpensive, simple and easy to install

Write today!

Ask for specification sheets #629 and #630 and Manual #601. Local LAU representatives can engineer fans to the specifications of homes you are building. Two-speed motors available on all residential fans.

THE LAU BLOWER COMPANY • 2023 Home Avenue, Dayton 7, Ohio
How You Install a Complete Chimney In 97 Minutes

WITH
VAN-PACKER
PACKAGED MASONRY
CHIMNEY

A complete Van-Packer Chimney can be installed by one man and a helper in 97 minutes. Here's how: 1. Nail chimney support in place. 2. Set each Van-Packer section and cement with prepared acid-proof cement furnished. 3. Nail flashing to roof, slide housing over sections, and cement rain cap in place. It's as easy to build as that. Everything furnished—nothing else to buy. Nationally distributed so you can get immediate delivery. Write for free folder and name of nearest dealer or jobber.

Van-Packer Corporation
209 S. LaSalle St. • Chicago 4, Illinois

Convecto type baseboard panel with circular fins

Convecto type baseboard panel with rectangular fins and 1-inch pipe located off center

Control Systems

It is fully as important to have a good control system as to have a good heating system, for without it the heating system will not function at maximum efficiency. The following control set-ups are basic and will be used depending upon the heating system selected and the degree of automatic control desired:

Hand-fired coal, gravity warm air. A room thermostat governs operation of damper motor, which is connected to both draft and check doors on

(Continued on page 304)
new in '32
still better today

Improved K3-A Solenoid Gas Valve...
Quiet—Dependable—Hi-Capacity—
Soft Seat—For All Gases—

Way back in 1932, the forebear of the present K3-A was originated, developed and pioneered by General Controls. It became the first in a long series of quiet, dependable, two-wire solenoid magnetic gas valves that today are standard equipment at home and in industry for controlling gas to warm air furnaces, gas-fired boilers, conversion burners and similar applications. Closing with the gas flow, in the K3-A the pressure is on the top of the soft seat assuring indefinitely tight valve shut-off. Closing is automatic in case of power failure, and the K3-A, like all other General Controls solenoids, is absolutely humless when energized. Current consumption is low and the extremely compact valve easily meets high flow capacities and operating pressure requirements. In the K3-A you find just one more sound reason why the leaders everywhere declare that for the best in automatic controls, it's General Controls!

GENERAL CONTROLS
601 ALLEN AVENUE GLENDALE 1, CALIFORNIA
Manufacturers of Automatic Pressure, Temperature, Level and Flow Controls

FACTORY BRANCHES: Baltimore 3, Birmingham 3, Boston 16, Buffalo 3, Chicago 5, Cleveland 13, Columbus 13, Dallas 3, Denver 4, Detroit 31, El Paso, Glendale 1, Houston 4, Indianapolis 4, Kansas City 2, Milwaukee 3, Minneapolis 7, Newark 6, New Orleans, New York 17, Omaha 2, Philadelphia 23, Pittsburgh 22, St. Louis 3, San Francisco 7, Seattle 1, Tulsa 6, Washington 6, D.C.
DISTRIBUTORS IN PRINCIPAL CITIES

APRIL 1952
Regardless of architecture, color motif or styling, there is a Pry-Lite for every room in the home. New, attractive finishes of chrome, copper, brass and painted hammer tone gray blend with any furnishings or interior decoration. Beautifully patterned glass gives clear, full illumination without glare or dark spots. Snap-on fronts make Pry-Lites easier to clean or relamp—there are no screws, no hinges, no nuts, and no tools needed.

And, more important, Pry-Lites (1000 series) cut costs because they have... (1) A pre-wired, built-in pull box; (2) adjustable mounting straps that eliminate framing-in time; (3) a plaster flange which fits any finish; (4) and they are U.L. approved for any standard building wire.

A Blo-Fan electric exhaust ventilator makes the kitchen complete and modern. Its patented blade combines the volume of a breeze fan with the power of a blower. Its attractive grille is removable without tools and the motor assembly merely lifts out for easy cleaning. Pry-Lite modern recessed lighting fixtures complete the picture.

* A Blo-Fan electric exhaust ventilator makes it as easy to control the rate of ventilation as it is to control the speed of a car. Standard equipment on De Luxe Model 210 Blo-Fan only.

**TRADE MARK REG.**
Make Buyers Out of Shoppers With Value... Quality

Survey after survey has shown that there is a market for approximately 1,000,000 houses a year for the next several years... BUT, all building trades are faced with keener competition than ever before.

Because... People who buy, build or remodel are more discerning—they are demanding value and quality when they invest, even before price. That is when the reputation of Blo-Fan electric exhaust ventilators and Pry-Lite recessed lighting fixtures is an important factor for architects, builders, and electricians to consider. The reputation of Blo-Fan and Pry-Lite names is built on value and quality. Skilled craftsmanship plus quality material from reputable sources have been important in building the Blo-Fan and Pry-Lite names and what they stand for—just as your name and reputation are made and recognized through the products you use and the way you use them.

Remember the old adage, "Quality is remembered long after price is forgotten." Remember, too, that when you specify or install Blo-Fan electric exhaust ventilators and Pry-Lite recessed lighting fixtures...

their reputation will guard yours

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EASTERN FACTORY: 124 Adams Street, Newark, New Jersey
Warehouses: Los Angeles, San Francisco, Chicago, Atlanta
Stocked by more than 700 wholesalers in over 350 cities.

APRIL 1952
VULCAN
FIN-TUBE RADIATION
is MODERN in DESIGN

Vulcan combines a smart, modern-looking, comfort-assuring heating design with easy installation. For either hot water or two-pipe steam systems.

CONTINUED FROM PAGE 308

Hand-fired coal, forced circulation. This system has a thermostat, damper motor, transformer, limit control, and in addition, a relay to start and stop blower motor or booster pump motor. There is also a reverse-acting control in the voltage power circuit for starting the booster pump or fan motor in case the room thermostat is not calling for heat. This takes care of any override in temperature within the heating unit itself so that no injury will result from overheating.

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940 Arlington Ave. • Oakland 8, Calif.
401 No. Broad St. • Philadelphia 8, Pa.

HANDBURNER TRANSFORMER / MOTOR

FOR EVERY HEATING NEED!

THERE'S AN AUTOMATIC

JOHNSON
Oil BURNER

FOR EVERY HEATING NEED!

PRIVATE HOMES
HOSPITALS
HOTELS
PUBLIC BLDGS.
SCHOOLS
FACTORIES

For Steam, Hot Water, Hot Air Systems. Engineered and built to produce a maximum of usable heat from minimum fuel consumption, Johnson Oil Burners are known and respected the world over. There's a Johnson Burner dealer near you.

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401 No. Broad St. • Philadelphia 8, Pa.
Getting to be a habit—

one good thing

leads to another

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leads the way!

Over 135 different domestic heating units to meet the needs of the most discriminating...

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Division of Borg-Warner Corporation
Living's a treat with Norge Heat
The Best
IN KITCHEN VENTILATION

EXCLUSIVE IN
TRADE-WIND
VENTILATORS

Look at the location of the motor in every
TRADE-WIND
Ventilator—in a separate, insulated compartment. This extra construc-
tion is another exclusive
TRADE-WIND
advantage. The motor is completely pro-
tected from the hot, greasy air. No dust or
steam or grease are blasted at the motor.
It always stays clean and cool in its own
compartment—needs less frequent oiling—
lasts years longer. You can count on
TRADE-WIND
for quality performance.

The only ventilator that gives you

- Centrifugal Blowers
- Isolated Motor
- Dropless Grille
- Easier Installation

PRICE OFFERS AN INDUCEMENT
BUT QUALITY OFFERS A REASON

TRADE-WIND
MOTORFANS, INC.

5705 S. Main St., Los Angeles 37, Calif.

(Continued from page 304)

Stoker-fired coal with forced cir-
culation. These controls are the same
as system No. 2, except that a timer
relay is used in place of damper motor
and transformer. In some hook-ups
a stack control is used instead of
relay for the hold-fire. This, however,
has a tendency to corrode and deter-
iorate. Timer relay is preferred.

Oil-fired forced warm air. This is
similar to oil-fired gravity circulation,
with the exception of a limit control.
Instead, a combination fan and safety
switch is installed. This starts the fan
motor when the boiler of the furnace
has sufficient heat. It will also stop
the oil burner in case of excessive
boiler temperature. This hook-up de-
lays the starting fan until heat is

(Continued on page 308)

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across the FULL CASH ORDER. No
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H. C. BIGLIN CO. INC.
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AMERICAN BUILDER
"More living room is no problem with this hideaway furnace"

says Phil Hedback,
Bryant-Hedback Co., Indianapolis, Ind.

With useable space at a premium, it is little wonder that the Bryant Hideaway Gas Furnace is proving so popular. Architects and builders say it not only saves valuable space, but the furnace, itself, is a real selling feature.

Tucked away in the attic—or suspended from the ceiling or under the floor—this dependable forced-air furnace provides a world of comfort for householders while releasing extra space for storage, utility purposes or plain living.

The Hideaway is a true Bryant product—long on dependability and gas economy, and with positive automatic control. Naturally, the casing temperatures are low. You’ll also like the way it goes in—structural steel mounting channels come with it and can be used to suspend the unit when it is so installed.

Yes, you’ll like this Bryant Hideaway Forced-Air Furnace that gives you both added living space and better heating.

Why not ask your Bryant Distributor for full details? Or write Bryant Heater Division, Dept. 173, Affiliated Gas Equipment, Inc., 17825 St. Clair Ave., Cleveland 10, Ohio.

Bryant Model 324
Hide-away Gas Furnace

Can be tucked away in the attic, or suspended from ceiling or under the floor. Fully automatic, forced-air unit with Havigage heat exchanger. Available for all gases. AGA inputs: 65, 85, 100 and 125 thousand Btu per hour.
Williamson Furnaces are nationally advertised and have over 60 years of homeowner acceptance.

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Cincinnati 9, Ohio
Have an authorized Williamson Representative give me information on:
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□ Basement installation □ Utility Room installation
Name:
Street:
City, State:
Zone:

OLY FED FORCED WARM AIR
(Continued from page 30)

Oil-fired gravity circulation. This system is identical with hand-fired and stoker-fired coal hook-ups except that the protecto-relay replaces timer relay or damper motor. This protecto-relay is for the intermittent burner ignition, probably the most essential control in any oil burner installation. It stops the burner if there is a stoppage in oil flow, and also stops ignition motor if ignition fails.

Oil-fired forced hot water. When the room thermostats call for heat, the relay closes the power circuit and starts the booster motor. This also energizes the protecto-relay, which starts the oil burner. The aquastat will stop the oil burner if water temperature becomes too great, while the booster pump will continue to run until the room thermostat is satisfied.

Gas-fired gravity circulation. The line voltage power circuit is reduced in voltage for operation of a solenoid gas valve installed in the gas supply pipe. The valve operates from a low-voltage thermostat, through the limit.
Control, which prevents overheating of the unit.

**GAS FIRED FORCED WARM AIR**

Gas-fired forced warm air. This is the same as the oil-fired forced warm air except that a single-pole, single-throw relay is used instead of the protec-to-relay. The room thermostat calls for heat, closes the relay, and causes the gas supply valve to open. Bonnet temperature activates the fan which will run as long as bonnet temperature stays high enough. Fan and safety switch prevents bonnet from overheating.

**GAS FIRED FORCED HOT WATER**

Gas-fired forced hot water. This is similar to the gas-fired warm air system except that an aquastat is used in place of combination fan and safety switch. Booster pump operates directly off room thermostat, runs as long as it calls for heat. The aquastat is strictly limit control.

(Continued on page 310)
When you know the facts about WEIR-MEYER steel warm air heating equipment, we believe you'll see why you'd choose it for your own home. Of course, we don't know how many builders and contractors own WEIR-MEYER, but we do know that many continue to install our equipment year after year in the homes they are building. And we believe that the reason is this: WEIR-MEYER performance pleases home owners. After all, isn't that what you want?

**WEIR-MEYER**

**MEANS**

**MODERN HEAT**

THE MEYER FURNACE CO.

Peoria 2, Ill.

Manufacturers of Weir & Meyer Furnaces and Air Conditioners for Gas — Oil — Coal

Factories: Peoria and Peru, Illinois

Keep WEIR-MEYER data on hand for reference. Send for complete File Catalog on WEIR-MEYER Equipment.

---

**STOKER FIRED STEAM WITH YEAR ROUND DOMESTIC HOT WATER**

(Continued from page 309)

Stoker-fired steam system with year-round domestic hot water. This has the same controls as for stoker-fired steam with gravity circulation, except that a single-pole, single-throw relay is used instead of a timer relay. An immersion aquastat connected in parallel with the thermostat causes the stoker to run enough to maintain heat within the unit and heat domestic water. This also acts as a hold-fire control.

**OIL FIRED STEAM WITH YEAR ROUND DOMESTIC HOT WATER**

Oil-fired steam system with year-round domestic hot water. Identical to the stoker-fired steam control except that a protecto-relay is used in place of the single-pole, single-throw relay. Immersion aquastat and room thermostat start the oil burner, while limit control prevents overheating and damage.

---

**STOKER FIRED HOT WATER WITH YEAR ROUND DOMESTIC HOT WATER**

Stoker-fired hot water with year-round domestic hot water. Immersion aquastat causes stoker to maintain boiler temperature. In addition, a strap-on limit aquastat should be installed to prevent injury to the heating system should the operating aquastat fail. The thermostat operates the relay to booster pump, controlling the flow of hot water to the rooms. A reverse-action, strap-on aquastat starts booster pump as a safety measure to take care of water temperature override.

---

**OIL FIRED HOT WATER WITH YEAR ROUND DOMESTIC HOT WATER**

Oil-fired hot water with domestic hot water the year around. This is the same as the stoker-fired, except that the protecto-relay is used instead of a single-pole, single-throw relay, and reverse-action aquastat is eliminated.

**Other Controls.** In addition to the basic control hook-ups outlined above, there are zone controls for close local control of heating, indoor-outdoor systems which control temperature by a bulb outside the building connected with another located in the stream of the heating medium, and both connected to a temperature controller. There are also pneumatic control systems and electronic set-ups which replace the low-voltage electric systems outlined above in some situations.

**Heating Commercial Buildings**

Heating commercial buildings requires consideration of the size and type of building, its functions, space requirements and limitations, installation costs and maintenance costs, as well as operating problems. For any small commercial structure, the heating plant should be calculated to cost roughly 10 per cent of the total cost of the building; otherwise, heating may prove inadequate.

The simplest structure to be heated is the small monitor building occupied by a neighborhood service business. Floor space is usually at a premium, and heating must be economical and not take up space. For this purpose, floor furnaces, unit heaters, or radiant panel constructions have proved desirable.

Another type of one-story commercial building has its space divided typically into showrooms, offices, and...
Here's your opportunity to install America's finest prefabricated packaged Chimney. Functions as a complete chimney for all heating equipment.

- Lightweight—only 10 to 15 lbs. per ft. Installs easily and quickly in less than an hour. The chimney is mounted between ceiling joists, directly over heating unit, saving valuable floor space.

- Vitroliner is designed for 1 or 2 story construction to fit the individual roof pitch, with a TAILOR-MADE roof flashing and flue housing—no cutting or fitting is required on the job! The chimney is built around a vitreous enameled metal flue liner—encased in a seamless tube of high temperature—resistant insulation—with an outside metal covering.

- In two-story construction (Type "L") the flue can be boxed in a corner of a room, closet or bath room as illustrated.

- Quality-built for long life—time tested for over 10 years and proven successful. Nationally accepted by large project home builders and single contractors. Accepted by F.H.A. and listed by Underwriters Laboratories for ALL fuels.

**FEATURES**

- Saves valuable floor space
- Installed in less than 1 hour
- Highest quality at lowest price
- Highest heating equipment efficiency
- Provides attic ventilation
- Eliminates condensation
- MFD. in 6", 7", 8" and 10" Dia.
- Direct factory shipments
- Available in any quantity

Investigate this fast-selling modern low-cost chimney today. Write for illustrated circular or phone Armitage 6-5070 for quotations.

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**Mr. Builder:**

**SAVE THAT EXTRA PIPE**

— it's almost enough for your next job!

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When you can save precious pipe today, it's news, and a saving of 40% is BIG news! Hundreds of Burnham BASE-RAY® Radiant Baseboard installations, made with the Series Loop System, (See diagram) have proven that with this system you'll not only save pipe, but fittings will be **49% less**... installation labor **54% less**! And remember... with BASE-RAY you'll be giving your customers the most efficient, space-saving radiant baseboard heating available!

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**Burnham Corporation**

*First in the manufacture of baseboard heating*

Irvington, N.Y.

Dept. AB-42

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Burnham Corporation

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Like a sale 'round—
that's the kind of
savings the Venko
Packaged Unit
by KOVEN nets
your customers.
Yes—modern de-
sign and selected
controls mark
down fuel bills.
Two sensitive
aquastats assure
abundant heat and hot water—dollars
worth of trouble-free service for a few
cents a day. On your side of the balance
sheet—Venko is a short cut to tall savings
because it comes completely equipped
for speediest installation. All wiring in
place. All parts properly installed. All
controls thoroughly tested. No costly
waiting for missing parts. No expensive
service calls. More and speedier in-
stallations...

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Plants Jersey City, N. J., Dover, N. J.

Basic units used with three
different types of heating
control systems. Above
left: Electronic; right
above: Electric; lower
right: pneumatic

(Continued from page 318)

workshops—for example, commercial garages. Direct-
fired unit heaters, or combinations of unit heaters with
self-fired radiators can be used. Forced air heating will
give satisfactory results, as will central steam and hot
water systems with radiators or convectors. Radiant
panels installed in the floors will also give good service.

The third main type of small commercial building is
the multi-story multiple purpose building with first floor
used for offices or warehouse space, with offices or living
quarters above. This type often encounters the problem
of different tenants trying to regulate heat in their own
quarters by turning off radiators, partially closing them,
opening windows and wasting heat. Two-pipe steam and
both one and two-pipe hot water systems usually prove
most effective.

Air Conditioning

Air conditioning is the control of temperature and
humidity; it also includes the control of air motion
(Continued on page 318)
How to GUARANTEE PLENTIFUL

Hidden Comfort means more home for the money

Adaptable to any type of installation or floor plan, The Norman Southerner is one of the most flexible forced-air gas furnaces on the market. Fits in any small unused space—saves on installation, chimney and piping costs. Four sizes: 40,000 to 100,000 BTU. Send for literature, specifications and name of nearest representative or distributor.

Made by the makers of the famous Norman Three Sixty
Unit Type Gas Heater

How to GUARANTEE PLENTIFUL

HOT WATER

Specify and Install

ALDRICH

High Delivery

HOT WATER HEATERS

Aldrich Heaters, in seven sizes, deliver from 93 to 850 gallons per hour, at 100° rise. And they deliver more contracts to you—because you can install them for either gas or oil firing, or for later conversion. Get all the hot news on Aldrich today. Write for name of nearest jobber. Also details on other Aldrich units.
The "little extra" that clinched a sale...

HASN'T IT HAPPENED TO YOU?

You sensed that your prospects liked your house, but apparently had seen several they liked equally well.

So you turned on the "And look at this special feature" sales talk. Colored bathroom fixtures, maybe—or easy-open windows—or tricky hardware—or perhaps a built-in kitchen ventilator. And the lady succumbed—didn't she?

FASCO ventilators are this kind of "little extra" that clinches sales. And the wonderful thing is not only that they help close deals and pay you extra profit—but you can point to the brand name with special pride—because no ventilators in America are better made or better values.

Write for illustrated literature.

Belt Drive Fan Installations

Basement

If basement windows are large enough to provide ample exhaust, this location is sometimes preferred. Enclose stairwell and locate fan under stairs (removing risers) or on one side.

Gable Installation

When the attic is finished, making it airtight, the fan is often installed behind a manual shutter or metal louvre in the gable. Entire attic serves as a suction box for opening in attic floor.

Attic Stairway

Fan is connected with an enclosed portion of the stairwell. No ceiling grille is required, attic door is opened when fan is operating. Valuable attic floor space is saved.

Suction Box

Because many attics are not sealed, it is necessary to use an airtight suction box over a centrally located ceiling grille to assure the full effect of the fan in the rooms below.

Vertical Discharge

All Hunter belted units can operate in a horizontal position, discharging vertically. This solves installation problems in many modern homes having limited attic clearances.

Attic Wall

In homes where main portion of attic space is finished, unit may be mounted in partition wall, discharging into unfinished attic space. Fan is installed in the shipping crate.

Pressure of Atmosphere for Various Readings of Barometer

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A 3-Minute Course on Low-Cost Home Cooling

HOW ATTIC VENTILATION COOLS A HOME

It’s cooler outside at night

All day long a home absorbs heat from the summer sun. At night when outside tempera-tures have fallen to 75°, for example, the dead hot air in the attic may remain as high as 110°. This keeps the rooms below at an unbearable temperature up to 95° or more. Nobody can sleep.

Attic fan pulls the cool air inside

A Hunter Attic Fan pulls the cool, refreshing outside air into house, driving out the oven-like heat from the attic and every room. A few minutes after the fan is started, room temperatures drop 10° to 20°. An automatic time switch can be used to switch off the fan while occupants sleep.

HOW TO MAKE PROVISION FOR ATTIC FANS IN YOUR HOMES

Step 1. Frame for ceiling opening

By framing and installing fan when home is built, no extra construction expense is involved. If installation is to be made later, framed opening can be temporarily plastered over or closed with plywood.

Step 2. Provide adequate louvers in proper location

On new construction it costs little to include exhaust openings to handle attic ventilation. These may be gable louvers or porch, soffit or basement exhausts, depending on the design of the house.

NEW HUNTER PACKAGE FAN IS INEXPENSIVE AND EASY TO INSTALL

A Hunter Package Fan is the most practical and least expensive method of keeping a home comfortable on hot nights. This compact unit is easily installed in any new or old home. Furnished complete with ceiling shutter and trim—no extras to buy or build. Choice of four sizes, to fit any home and climate.

This efficient attic fan is quiet and powerful, requires little or no maintenance. It costs only a few cents a night to operate and will last for many, many years. Backed by Hunter, exclusive fan makers since 1886.

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303 S. Front Street
Memphis 2, Tennessee
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Name
Address
City and State

A 3-Minute Course on Low-Cost Home Cooling

APRIL 1952

313
Here's an easy way to get new essential information that will help you increase your income. Every volume a standard work by leading authority. Remember—it's the informed builder who is the successful builder.

**ESTIMATING**

1. **THE BUILDING ESTIMATOR’S REFERENCE BOOK** and Vest Pocket Estimator (not sold separately). By Frank R. Walker. Contains latest estimating and cost data on everything that goes into house construction. Most complete compilation of estimating and cost data available. $12.00.

2. **SIMPLIFIED CARPENTRY ESTIMATING**. By I. W. Wilson and Clell M. Rogers. Everything needed to take-off a bill of materials from set of plans and specifications for a frame house—with many helpful quick-reference tables and short-cut methods that simplify the work. $3.75.

3. **CONTRACTOR’S MATERIAL LIST**. A 10-column take-off form for complete listing of materials and labor costs. $1.00.

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6. **HOUSE CARPENTRY AND JOINERY**. By Nelson L. Burbank. Every step of carpentry in and around a house, clearly explained and illustrated. Covers every job from foundation forms to interior trim. $4.50.


8. **FUNDAMENTALS OF CARPENTRY**. By Walter E. Durbin. Complete house carpentry course in two volumes. Outstanding value. $7.50.

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**PLAN BOOKS**

11. **SUNSET WESTERN RANCH HOUSES**. Authoritative book on the California ranch house, with thorough pictorial descriptions and ground floor and site drawings. $3.00.


**PAINTING AND DECORATING**

13. **PAINTING AND DECORATING CRAFTSMAN’S MANUAL**. Sponsored by the Painting and Decorating Contractors of America. $2.00.

**HEATING AND PLUMBING**


15. **HOW TO DESIGN AND INSTALL PLUMBING**. By A. J. Matthews, Jr. Every step in the design and installation of the plumbing system, to fulfill requirements indicated in blueprints and specifications, explained and illustrated. $3.50.

**BRICKWORK AND MASONRY**


17. **MASONRY SIMPLIFIED**, Vol. II. Practical masonry procedures in the various phases of construction, from building forms for concrete to constructing fireplaces and septic tank systems. Includes discussion of handling new products such as glass blocks, waterproofing mixtures and insulating blocks. $5.00.

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23. **MODERN METHODS OF HOME HEATING**. Standard heating systems illustrated with 17 floor plans showing heating outlets. 40 photos of equipment and installations. 25 boiler and piping connection diagrams, and 11 heat loss calculating tables. $0.50. Your copy sent FREE if your Order totals $5.00 or more. Use coupon below—mail today!
THRUSH hot water heating system is flexible. With forced circulation and completely automatic control you can install any type of modern heating your customers desire and be sure of complete satisfaction. Heat from radiant coils hidden in ceiling or floor, radiant baseboards or convectors, with Thrush Flow Control System provide perfect comfort without overheating, automatically compensating for weather changes. Zoning is simple and inexpensive. Get all the facts on profitable Thrush equipment now. See our catalog in Sweet’s or write Dept. G-4
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From Air Conditioning to Wiring. Tells you how it works and where to use it. These 26 sections cover every phase of building—help you to determine the value of the product for the specific problem or operation you have in mind. Profusely illustrated with photos, diagrams, charts, tables of loads, weights, mixtures, etc. Written so you can understand it. Get acquainted with these product Reference Sections now.

DIRECTORY SECTIONS

The most complete and useful Buying and Selling Guide ever offered to Builders and Dealers printed on colored stock.

1. Alphabetical list of building products and equipment manufacturers
2. List of Brand Names
3. Names and Addresses of Manufacturers
4. List of industry and allied professional trade associations
5. List of participating communities in 1951 National Home Week

Overhead panel radiant heating fits many types of small businesses

(Continued from page 312)

and distribution, and cleans the air. The simpler type of air conditioning for homes involves the use of attic fans of various types, including home cooling fans with plenum chamber (suction box), which cool the house in summer by providing proper ventilation. Ceiling ventilators are also in this class.

Winter air conditioners are furnaces which send forced air, heated, humidified and filtered clean to each room.

Year-round air conditioners for homes are units which provide: (1) summer cooling, (2) dehumidification for summer temperatures; (3) winter heating; (4) humidification for winter temperatures; (5) air cleaning—a filtering out of dust, pollen, soot, and lint the year round; and (6) air circulation with ventilation—a draft-free flow of clean air, providing uniform temperatures.

Self-contained air conditioners are package units which give summer cooling, dehumidification, filtering (also air circulation and ventilation when installed with an outside connection). They are designed for individual rooms and can be used with duct work or installed directly in the space to be served. Self-contained units are also available which give year-round air conditioning for individual room areas, heating as well as cooling.

Several manufacturers now have available small capacity air conditioning units adaptable for installation in small, low-priced houses.
SEASONED LUMBER starts on its way through a prefab house factory. This huge machine makes as many as 23 cu's in one operation.

PREFABRICATION offers today's builders a choice between construction of "complete" homes pre-built in the factory and the use of prefabricated structural members to be assembled on the site in conjunction with conventional building methods.

Under the first plan the contractor or builder buys a basic dwelling largely complete, generally including all services and materials except masonry, plumbing, electrical items and finish painting. Some manufacturers even include electrical ranges and refrigerators.

Opportunities for Profit

For the individual contractor or builder with minimum capital to invest, "complete" prefabricated homes offer unique opportunities for profit. Financial risk is reduced because of greater assurance of delivery, quality control of materials and finishes, low overhead for the builder, and minimum investment.

Field erection is fast and easy due to accuracy of dimensions and fit, and the use of standardized sizes of structural members. Houses can be placed under roof in one day with the consequent advantage of sheltered construction for the rest of the work. Erection costs are thereby reduced and volume construction made possible.

The builder also benefits from the sales promotion and advertising aids of the manufacturer, as well as from the research and advisory services of the manufacturer's organization. Even financing is offered by some manufacturers.

The usual working arrangement between builder and manufacturer is in the form of an exclusive franchise for a given area. The builder is responsible for all arrangements for procurement of land, building permits, and other local details, and handles sales and servicing of completed homes.

Salability

Manufacturers' attention to design, which now ranges from the traditional to contemporary styles, with the inclusion of personalized features, has gained increasing acceptance and popularity for the prefabricated house.

Individual taste preferences are satisfied in a wide range of interior finishes—plaster, gypsum board, or almost any other type of wall covering—and in flexibility of room arrangements. Variation in elevations, ornamental exterior details and floor plans removes the element of sameness which formerly marked many low-cost houses.

The assurance of delivery to the customer, the reputation of quality materials and construction, and the low-cost feature make these prefabricated models particularly attractive for FHA and GI financing. They carry a high rating for such government approval, and are therefore easily marketable.

Combination of Prefabrication, Conventional Building Methods

For those who find it more practical to combine conventional on-site methods with prefabrication, there is an opportunity for profit in cooperation with an important member of the building industry—the lumber dealer. Without going into "complete" prefabricated construction, the builder can still take advantage of some of the money-saving features of prefabrication.

Prefabrication by definition requires the use of factory production methods, and individual builders may
Construction Methods

Basically, the manner in which prefabrication differs from conventional building procedures is in producing standardized parts, such as a series of room-size sections, which will permit assembly at the site without the need for cutting and shaping operations characteristic of on-site construction. This, of course, requires that the houses must be reduced to a minimum number of different parts, so design is highly important. Each and any part should be adapted for interchanging with others of its particular size and construction so that it will fit into its proper place in any house of like design.

Design systems most commonly used in prefabrication are based on one or more standardized parts of fixed dimensions such as a fixed-width panel or a series of wall, roof and ceiling sections. The basic unit of most systems is the panel, which consists of both load-bearing and covering materials. It contains insulation and vapor barrier. Provision can be made for the insertion or attachment of windows, doors, electrical conduit, pipe and other accessories to the building site, or else they are installed at the shop. Interior panels if non-load bearing can contain built-in features such as bookcases and cabinets.

Roof Design

Some units such as roofs are less adaptable to shop prefabrication in the form of panels than others and therefore rafters and roof boards may be precut for site fabrication. The flat roof and simple gable roof are the most common prefabricated types. Pitched roofs can be designed for partial or complete prefabrication. Usually gable ends are prefabricated in sections for quick assembly at the site.

Design of gable ends is generally a simple matter of plywood or other sheathing fastened to studs with nails or glue. The roof is often of stressed-cover construction. Plywood or other coverage is often fastened to rafters on one side only, and the roofing is applied on the site.

Joint Design

Joint design is especially important in prefabrication because it not only affects the strength of such structures but also governs to a great extent the degree to which parts are interchangeable and the ease with which the structure can be erected. Three types of joints are discussed here: (1) those between panels; (2) those connecting the walls and floors to foundations; and (3) those attaching roofs to walls.

Applications of Prefabrication

Prefabrication is not limited to the construction of private homes for sale only. It is ideally suited to the development of low-cost rental units such as defense area housing and as such is particularly attractive to government financing.

Its uses for non-dwelling structures are increasingly recognized. Portable and knock-down farm buildings such as corn cribs, sheds, hog houses and chicken houses can be constructed in 12 to 14 hours. With the use of corrugated steel and aluminum, light industrial buildings can be erected successfully by prefabricated methods.

have neither the equipment nor the storage space to develop these methods. By arranging to serve an individual builder, or group of builders, the lumber dealer may use his facilities to prefabricate on a profitable scale.

Factory-production methods require stock-piling of materials such as lumber, plywood, wallboard, insulation and framing members; the use of power machines and materials handling equipment. Ordinarily, the lumber dealer will have hand trucks and dollies, woodworking machinery and similar equipment. The addition of jigs to insure accurate assembly of parts, assembly tables for ease of operation, fork-lift trucks, painting equipment and transportation facilities provide the basic means for larger scale operations than the individual builder would normally find convenient.

JIG AND FLOW LINE for interior wall partitions. "Starting" jig is in foreground, and subsequent stations complete the panel assembly.

PRODUCTION LINE for roof panels. Plywood sheathing covers the rafters and serves as the base for roofing paper and asphalt shingles which will be applied at the site.
NOW you can crack the big, profitable low-cost housing market. You’ll be able to sell ruggedly-built, handsomely styled homes in the $7,000 range, practically anywhere with the $2,750 P & H Enterprise Home.

This 2-bedroom home (PH1-EA228S-52)—the most complete prefab package on the market—is just one model in the new low-cost Enterprise Line. This line offers you 2 or 3 bedroom models, 672 to 864 square feet, in 18 different exterior designs.

All the Enterprise models have the same quality construction and floor plans as the luxury P & H Capitaline homes. All offer you the advantages of P & H prefabrication—volume sales, project savings, minimum risk, prompt delivery and financing.

Take advantage of the booming low-cost market now. Sell P & H. Write for details today.

HERE’S WHAT YOU GET in the $2,750 Package

A Real Home Value at Any Price
- gas or oil-fired furnace
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- kitchen cabinets, formica-topped counter
- Rusco metal windows, screens
- full size picture window
- prefitted fir panel doors
- rugged room-size wall panels
- complete gable and roof panels, trusses
- full Fiberglas insulation throughout
- predecorated gypsum board ceilings
- side wall and roof shingles
- felt building paper, cornice, trim lumber
- all hardware
- Van Packer chimney
- shipped on one trailer truckload

P & H CAPITALINE HOMES . . . for luxury living

Architect-designed, these P & H Homes have all the styling, construction and convenience features that buyers look for. And they have all the features that mean higher sales and lower costs for you. 44 elevations, 6 floor plans, all reversible. Basement or utility room models, 2 or 3 bedrooms. Write for free booklet today.

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Here's the sidewall that puts "sex appeal" in home exteriors! Colorful, rich and attractive, Shakertown Sidewalls combine the advantages of distinguished beauty with the economy of double-coursed cedar shingles.

There's no secret about the phenomenal demand for factory-stained Shakertowns. They mean lower construction cost, even lower cost per year of service — with better insulation, less upkeep and added property value. They're architecturally right, too.

Whether you're building one home or one thousand, if it's good profit you want, you'll be ahead with Shakertown Sidewalls. It pays to stock and sell them!

Get the facts! Find out why shake homes, in project after project, have sold far ahead of any other homes built of standard materials.

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Low cost
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Last word in convenience

L-Shaped homes... ranch type homes... individually styled homes, so desirable for project building... in the price range that attracts the vast majority of home buyers. You can offer wide variety of designs... low first cost and quick occupancy for your customer. And assured final cost and profit for you.

Find out for yourself why so many have switched to Gunnison. Write Dept. A-24, Gunnison Homes, Inc., New Albany, Indiana, for interesting details.
THE SLAB FLOOR FOUNDATION is the prevailing type for prefabricated houses in the lower price brackets, but full basements are often used. The builder prepares the foundation in advance of delivery of the packaged house from the factory.

**Shop Assembly Operations**

The basic assembly operations involved in production of panelized construction usually comprise (1) assembly of framework; (2) installation of necessary wiring, framing for fixtures, duct work, water pipes, and similar equipment; (3) attachment of the framing of window and door openings; (4) fixing insulation and (Continued on page 326)
Build NATIONALS . . .

and offer homes to meet every family income!

You can satisfy any prospect with National's two great lines of houses: the De Luxe styles ranging up to 56 feet, some with two baths, fireplaces, basements, breezeways, garages . . . and the "Super-Thrift" models in 2-, 3- and 4-bedroom plans at minimum prices. All National homes are the newest in smartness, comfort, quality materials. Build Nationals and you build SUCCESS!

Some territories still open — sound financial resources required. Inquire today on your business letterhead.

National Homes prefabricated panels and structural parts are commended by Parents' Magazine as advertised therein.
THE MANUFACTURER’S TRUCK arrives at the foundation at the start of a working day. The first panels are unloaded.

Assembly of Framework—Nearly all prefabricators assemble panel frameworks on jigs. The principal factor involved is to match all framing joints as precisely as possible, so that the surfaces on which the covers will be attached are in a single plane at all joints. The need for precision varies somewhat with the type of construction. Nailed pannelized construction of conventional framing, sheathing, and siding is less critical than, for example, glued stressed-cover construction.

Framing may be assembled with nails, with corrugated fasteners of the type used in box manufacture, or some other mechanical fastening. Framing joints are rarely glued. For large frameworks of stressed-cover type, nailed joints are advisable to secure adequate strength for handling in further assembly operations.

Installation of Equipment

Unless otherwise provided for, all necessary electric wiring, backup plates for switches and other electrical fixtures, furnace ducts, framing for heat registers, water and plumbing pipes, gas lines and similar household equipment must be installed before the covers are attached to the panels. Some prefabricators design their panels so that some of these appurtenances can be installed on the site; for example, using a wall panel with the inner face open at the bottom and with studs bored for electrical conduit so that a baseboard conceals the opening in the finished house.

Installation of Doors & Windows

Generally speaking it is a simple matter to attach door and window framing or the complete unit in place in a properly framed panel. A separate jig may be used for each combination of doors and windows, although frequently a single large adjustable jig may be used to assemble sections of various lengths. The guide blocks of the jig automatically position the door or window framing as

(Continued on page 326)
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work in connection with the sale, erection and financing of small
and medium sized homes, this is your opportunity to get in on the
ground floor of the fastest growing branch of the building industry.

Ford Homes are not just "Another prefab shell." They come
to you in large panels with doors and windows hung and trimmed—
insulation and interior wallboard applied—electric outlets installed—
hardware applied—even the hardwood flooring is laid, sanded
and finished.

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1. Truck delivery direct to site.
2. Erected in one day.
3. F.H.A. approved construction.
4. Variety of design.
5. Ideal for development projects.
6. Accepted by leading code authorities.

AND BEST OF ALL—They are available now!

Write us today for plans, specifications, prices and further details of
our dealer proposition.

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McDonough • New York

(Continued from page 326)

well as the main studs and plates. To
this rough framing the finished door
and window framing is then attached
as in conventional housing; trim, however, generally cannot be in-
stalled until the wall covering has
been attached.

Insulation
Blanket-type insulation is usually
installed between studs and joists by
stapling with a hand stapler of the
type operated with a hammer. The
principal precaution necessary is to
see that the insulation fits tightly to
the frame to prevent heat loss
through this seam. Stapling must be
secure enough also to prevent sagging
of the insulation during the life of
the house. Some prefabricators fasten
the insulation with wood or heavy
fiberglass nailing strips to make a
tight joint between insulation and
framing.

Rigid fiberglass insulation can be
tacked to base strips nailed to stud-
ing or inserted in pre-cut grooves in
the studding. The latter method is the
simpler from the standpoint of
assembly.

Siding
Siding in prefabrication is attached
largely by the same nailing tech-
niques as are followed in conventional
site construction. One method com-
bines plywood nail-glued to the
framework in the shop with siding
applied at the site. This permits use
of any exterior coverage by conven-
tional methods, thus effectively con-
cealing panel joints. Interior wall
partitions are assembled with nail-
 glued plywood on both sides of frame-
work; floor and ceiling panels may be
covered with nail-glued plywood on
one side.

Attachment of Trim
The final assembly operation pre-
ceding application of finishes is
usually the application of door, win-
dow and other trim. In general this
is a simple carpentry operation, and
includes putting and caulk to
assure weather-tight joints around
wall openings.

Painting Operations
Finish painting is done at the site
after erection has been completed;
the priming coat is applied in the
shop.
Rollers suitable for manual opera-
tion are faster than brushes but a
brush must still be used for trim,
sash, doors and moldings. Dipping by
dip tank and drain rack for applying
wood sealer to prefabricated panels is
widely practiced. But since interior
and exterior surfaces require dif-
ferent kinds of coatings generally, the

(Continued on page 330)
Modern Homes are designed and built to meet the requirements of critical residential builders, prospective owners, FHA and VA agencies and lending institutions. They meet the standards of the building trades everywhere. Modern Homes offer the flexibility of layout practical only with non-load-bearing partitions and trussed roof construction. Varieties of front elevations are available for each model. Every Modern Home is a conventional, attractive, quality home comparable to the best site-built residence.

We show here typical models, floor plans and partial specifications. For complete details write on your letterhead for our owner prospect catalog, builder folder, and prints of 2, 3, and 4-bedroom types which interest you.

**Material Specifications**

- **Walls**—Studs, plates, 2x4 16" o.c., single plate bottom, double plate top. Insulation, 5/8" enclosed Rock Wool, vapor barrier. Wall panels sheathed with 1/2" Insulite. Siding paper, 15# asphalted felt; siding 8" bevel red cedar or equal. Corner braces, let-in, FHA approved.


- **Partitions**—Precut 2x4 studs, fir, 16" o.c. Non-bearing, for rock loth or drywall. Random 2x4 and 4x4 supplied for double plate and door headers.

- **Roof**—Trussed-roof construction. Fir 2x4 with 5/16" plywood gussets nailed over joints, Easy cornice installation. Sheathing, 1x6 boards. Underlayment felt 15# asphalt impregnated. Shingles, 210; Gables, prefabricated V-joint T&G panels, screened gutters. Ceiling insulation, 24" blanket with vapor barrier.

- **Doors**—Interior, 1 1/2" birch, flush. Exterior, fir, 1 3/4" sash type, glazed; front, 1 1/2" birch flush type. Front and rear doors equipped with hardware. Frames, 2x6 rabbed fir or pine, precut, packaged.

- **Floors**—Material supplied, 1x6 boards. Precut bridging, 2x8 or 2x10 joists. 2x8 or 2x10 material for box sill, 1x10 or 1x12 pine apron material, drip cap, beam material, nails.

- **Interior Trim**—Each window, precut and bundled. Each door, precut and bundled. Base and shoe or combination base and shoe, pine.

- **Cabinets and Accessories**—"Youngstown" Kitchen and Medicine cabinets, all steel, baked white enamel. Cabinet sinks, single or double drainboard, single or twin bowl sinks; chrome plated faucet and strainer, provided with or without spray attachments. Dishwasher and garbage disposal units if desired. Bread boxes, vegetable boxes, mats, flour bins, furnished.

- **The MELODY** 30' x 24' — 3 bedrooms (with basement)

- **The HOLIDAY** 31' 6" x 28' — 3 bedrooms

- **The GENTRY** 38' x 24' — 3 bedrooms

For full details, prices and delivery, write on your letterhead.
ALL EXTERIOR WALLS and ceiling sections have now been placed and work begins on the roof.

RAISING THE ROOF. Peak formed by two sections placed together. Gable ends are then hoisted into place.

BY THE END of the first day, the house is roughed in and under roof.

For large volume construction, schedules should be planned well in advance so that as parts for a house arrive, its foundation and sub-floor are in place and walls and roof can be erected during a single workday.

Site Assembly

This has been preceded by preparation of the foundation, and generally consists of erection of wall, ceiling and roof panels, together with interior partitions; all interior and exterior finish; application of roofing; installation of electrical, plumbing, heating and other fixtures; painting and other finishing.

Foundation construction for prefabricated house differs in no important respect from that for comparable conventional houses. The materials and building methods are the same, and design dimensions, such as thickness of walls and width of footings, are frequently prescribed by local building codes.

Erection Procedures

Most prefabricators plan their assembly operations to get the outer shell under roof in a day or less. Everything that will contribute to speedy shell assembly, including the laying of base plates for wall panels, should be done beforehand to help speed shell erection. All equipment needed to move and lift panels into place and fasten them together should be at the site, ready for use. Careful planning of details, from the loading of the truck at the shop so as to permit unloading of panels in the order needed, to an orderly plan of erection of panels in sequence is strongly advised by experienced builders.

All parts can be numbered in sequence of erection and stenciled clearly before leaving the shop so that loading will follow an orderly pattern and confusion on the site be avoided.

Sequence of Operations

This will depend somewhat on the type of house. A typical system, however, is to back up the truck-load of “packaged” materials to one corner of the building foundation. Erection of corner wall panels may begin at the diagonally opposite corner. Interior partition panels are set up as the laying of walls reaches the point at which these panels are connected to them. When all wall and partition panels are in place except those at the corner where the truck stands, ceiling panels are next unloaded and attached to the walls and partitions.

Again, when the laying of ceiling panels has reached the corner of the building where the truck stands, roof panels are unloaded and laid on top of the ceiling panels in the order in which they will be erected. The gable end on the far side of the building may then be lifted in place, and the process of assembling roof panels begins, once more moving toward the end of the building where the truck stands.

The final wall panels in the unenclosed corner of the building are not erected until all ceiling and roof panels have been at least laid in place; in the meantime, flooring, trim and other finishing materials have been moved into the house and piled where they will be conveniently available and out of the way of other erection steps.

This sequence is, of course, varied.

(Continued from page 328)

usefulness of dip tanks for prefabrication is limited.

Spraying is a most versatile high-speed method of applying coatings. It requires skilled workmen who can gauge the amount of paint applied and also equipment and working conditions must comply with various State Industrial Commission rules to safeguard against hazards of fire and health.

Transportation to Site

Prefabricated house parts are commonly transported to the site by trucks which are designed and fitted for safe loading of large structural units. Two types of loading are used: racking and stacking.

Racking consists of loading panels vertically, bottom edges seated between blocks fixed to the truck floor. Stacking consists of flat piling. Both trucking and storage require that adequate safeguards be employed to prevent deforming panel edges by rough treatment or exposure and damage to joints.

Storage

Planning to deliver parts at the building site the morning that the shell is to be erected usually eliminates the need for site storage facilities since millwork and other interior parts can be stored in the house itself.

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to fit particular requirements of building design. It may be that the gable ends are so prefabricated that their installation logically follows that of the roof panels; and if in the interest of greater variety of house design some combination of prefabricated sections and conventional construction is adopted, the builder may use conventional construction for roofs. Then the erection of prefabricated walls and ceilings for each house is carried out much as described above.

With some types of panelized construction, builders find it convenient to position wall and partition panels temporarily with bracing until the entire shell can be permanently tied together. This method permits adjusting wall and ceiling panels more readily for exact fit at joints with roof sections, trusses, or rafters. Bracing may also be necessary to hold the first panels in place when shell erection begins, at least until enough wall and ceiling panels are up to afford the necessary rigidity without bracing.

**Assembling of Panels**

The ease with which panels are jointed together at the building site, assuming that they are initially properly designed, will depend principally upon the care exercised in handling and shipping. Panel joints of the tongue-and-groove type are especially susceptible to damage by rough handling and exposure to moisture for prolonged periods of time.

On the other hand, if well designed with beveled edges and proper tolerances, and protected with skid strips against damage in handling, assembly is simple. Various devices can be used—interior partitions, for example, can be moved into position on a dolly. Joints between panels are usually caulked either before or after assembly.

**Metal Prefabrication**

While wood frame and plywood are perhaps the most commonly used materials in prefabricated houses, aluminum, steel and concrete are also adaptable. Strip steel framing members of about 12 to 16-gauge are increasing in use. Light in weight, easy to handle, they do not require any special tools and are often designed for the attachment of other materials by means of nails. In lower-cost basementless construction, provision can be made when pouring first floor slab and foundation walls for anchoring steel plate by means of anchor bolts placed in the concrete or masonry. Holes are factory-punched in the steel plate to receive anchor bolts.

Strip steel frames used in wall construction consist of framing and bracing members welded together to form rectangular sections, which, when bolted together at the site, act as a complete wall frame.

Frameless steel construction consists of panels fabricated of a series of cells or large sheets. These cellular panels have long been used for sub-floors but now have been adapted for bearing wall construction and for floors so that framing is not required. These panels are used either as exterior or interior surfaces, finished except for painting.

Steel walls and roofs require backing with insulating materials to retard heat conduction and also air space between the metal and insulation to take care of possible condensation within the wall.
## Directory of Prefabricated Home Manufacturers

### In the United States and Canada

**Admiral Homes, Inc.**
- 170 Waterford, Pembury 27, Pa.
- Distribution Area: Pennsylvania, West Virginia, Maryland.

**Allegro Homes Corp.**

**American Homes, Inc.**
- 165 W. 46 St., New York 19, N. Y.
- Plants: Lebanon, N. C., Allentown, Pa., Cookville, Tex.
- Distribution Area: All states east of Mississippi.

**Austin & Erickson**
- P. O. Box 291, Gig Harbor, Wash.
- Distribution Area: Pacific Northwest

**Borden & Babson Corp., The**
- 103-105 Kelley Ave., Middleport, N. Y.

**B.D. Homes Co.**
- Martin City, Mo.
- Distribution Area: Missouri, Kansas.

**Baird Property Corp.**
- 304 N. Main St., Eau Claire, Wis.
- Distribution Area: Northeastern Pennsylvania, Ohio, New York, Northern Ohio.

**Best Factory-Built Homes, Inc., W. G.**
- 630 W. Lake St., Fenn 4, Chicago 9, Ill.

**Builder Mfg. Co., Ltd., Inc.**
- 127 South Walnut St., South Bend, Ind.
- Distribution Area: Indiana, Illinois, Michigan, Wisconsin, Ohio, Missouri.

**Bush Prefabricated Structures, Inc. (Dlv. of Clinton G. Bush Co.)**
- 107 East Lenox Rd., Huntington Station, Long Island, N. Y.
- Distribution Area: National.

**Paul Bunyan Co., The**
- 811 East Lake St., Minneapolis, Minn.
- Distribution Area: Michigan, Wisconsin, Illinois.

**Castle Homes, Inc.**
- 1406 Wishbone Bidg., Salt Lake City, Utah.
- Distribution Area: Utah, Idaho, Nevada.

**C.C. Bloom Co.**
- 5199 S. Santa Fe Dr., Littleton, Colo.

**Connett "Engineered" Homes, Inc.**
- 1940 and Garfield St., Joseph, Mo.
- Distribution Area: Indiana, Kansas, Illinois, Nebraska.

**Cook Lumber Co., A. J.**
- 432 Lincoln Ave., Holland, Mich.
- Distribution Area: 50 mile radius of Holland.

**Crawford Corp.**
- 2103 Lake Ave., Corpus Christi, Tex.
- Distribution Area: National.

**Dorset Homes, Inc.**
- Fols, Ill.
- Distribution Area: Illinois, Wisconsin, Iowa, Texas.

**Divco Homes, (Prince Georges Development Corp.)**
- 4441 Belvedere Rd., Belvedere, Md.
- Distribution Area: Washington, D. C., area

**Economy Portable Building Co.**
- Factory and Hotel, West Chicago, Ill.

**Expandable Homes, Inc.**
- 2701 South St., Milwaukee 10, Wis.
- Distribution Area: National.

**Fishly Supply Co.**
- 1801 New Orlans, New Orleans, La.
- Distribution Area: National.

**Florida Builders, Inc.**
- 5390 Lake Ave., St. Petersburg, Fla.
- Distribution Area: Florida.

**Ford, Ivan R.**

**G&M-Way Corp.**
- Walnut, III.
- Distribution Area: Illinois, Indiana, Iowa, Wisconsin, Eastern Nebraska, Northern Kentucky.

**General Industries, Inc.**
- 3033 Wayne Trace, Fort Wayne 5, Ind.
- Distribution Area: Indiana.

**Green Line Homes, Inc.**
- Laurel, Miss.
- Distribution Area: National.

**Gunston Homes, Inc.**
- Distribution Area: National.

**Henderson Co., Inc., E. F.**
- 442-450 Sunset Blvd., Sunset Blvd., Los Angeles, Calif.
- Distribution Area: All states east of Mississippi.

**Home Building Corporation, Inc.**
- 303 North Park St., Sedalia, Mo.
- Distribution Area: Missouri, Kansas, Nebraska, Colorado.

**Mooser Homes, Inc.**
- 3362 North Capitol Ave., Indianapolis, Ind.
- Plants: Martinsville, Ind.

**Moenier Lumber Co.**
- 18310 Lankan Ave., Cleveland 19, Ohio.
- Distribution Area: Texas, New Mexico, Louisiana, Oklahoma.

**Buoyard Lumber Manufacturing Co.**
- Cairo, III.
- Distribution Area: 400 mile radius of Cairo.

**Johnson Quality Homes (Division of Pemberton Lumber & Millwork Industries, Inc.)**
- Pemberton, New Jersey.

**Kena Corporation**
- Thompson, Ga.
- Distribution Area: Georgia, South Carolina, North Carolina, Virginia, Tennessee, Alabama, Florida.

**Lindsey Homes, Inc.**
- 501 South 17th St., Stockton 92, Calif.
- Distribution Area: California.

**Richmond Builders, Inc.**
- 425 W. 8th St., Richmond, Ind.
- Distribution Area: Indiana, Ohio, Illinois, Kentucky, Michigan.

**L. E. Riedel Lumber Co.**
- Marion, Mich.
- Distribution Area: Michigan, Northern Ohio, Ind.

**Scott Lumber Co., The**
- 1131 Chapline St., Wheeling, W. Va.
- Distribution Area: Ohio, West Virginia, Pennsylvania, any place within 200 miles of Wheeling.

**Serene Homes, Inc.**
- Sonny, Mich.
- Distribution Area: Michigan, Ohio, Illinois, Indiana, Florida, Minnesota.

**SOO Corporation**
- Distribution Area: National.

**Southern Mill & Manufacturing Co.**
- P. O. Box 1087, Tulsa 1, Oklahoma.
- Distribution Area: Missouri, Illinois.

**Sedgwick Manufacturing Co.**
- Box 80, Houston 1, Texas.
- Distribution Area: 200 mile radius of Houston.

**Swift Homes, Inc.**
- 413 State St., Clinton, Pa.
- Distribution Area: Michigan, Ohio, West Virginia, Pennsylvania, any place within 200 miles of Wheeling.

**Timber Structures, Inc.**
- 350 E. 144th Ave., Portland 8, Ore.
- Distribution Area: National.

**Unit Structures, Inc.**
- Peshigo, Wis.
- Distribution Area: Midwest and East Coast.

**Virginia Loo Homes, Inc.**
- Devor Horton Blvd., Seattle, Wash.
- Distribution Area: Western half of Washington.

**Weaver Lumber Co.**
- Berkeley and 26th, Newark, Ohio.
- Distribution Area: Ohio.

**West Coast Mills**
- 555 State St., Chalilo, Wash.
- Distribution Area: West Coast and as far as for east as Mississippi River, also Mich., Ill., Ohio, Ind.

**Western-Built Homes**
- 1317 Madison, Spokane, Wash.
- Distribution Area: 100 mile radius.

**Winner Manufacturing Co., Inc.**
- Westport, N. J.
- Distribution Area: 300 miles of West Trenton.

**Yetter Homes, Inc.**
- P. O. Box 505, Savannah, Ga.
- Distribution Area: Alabama, Florida, Georgia, Louisiana, Mississippi, N. C., and S. C.

### CANADIAN MANUFACTURERS

**Engineered Buildings (Albion) Ltd.**
- Distribution Area: Alberta.

**The Holiday Ltd., Ltd.**
- Burlington, Ontario.
- Plants: Hamilton, Ontario.
- Distribution Area: Ontario.

**Linwood Manufacturing Ltd.**
- Box 40, Station W, Toronto 12, Ontario.
- Distribution Area: National.

**Premier Homes Ltd.**
- 711 Royal Bank Blvd., Winnipeg, Manitoba.
- Distribution Area: Manitoba.

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Production methods have changed greatly within the past few years. New building materials have come on the market. New tools have improved construction methods. Costs are way up on many items. These changes have made previous estimating data obsolete.

The Eleventh Edition contains up-to-date estimating and cost data on all classes of building construction. Information on house and other light construction work is complete. Thousands of items that enter into estimates are logically arranged and tabulated for ready reference.

Since the first WALKER appeared 35 years ago more than 106,000 have been published. Kept abreast of developments in the industry by frequent revisions it became the leader in its field. It has long been recognized as the only complete compilation of estimating and building cost data available in one book. Whether you build houses, do remodeling, alterations or repair work you will find in it the information you need to prepare accurate, dependable estimates.

This New Edition Will Help You
1. Increase your profits with more accurate estimates
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3. Prepare more accurate estimates by using correct methods of measuring and "taking off," figuring quantities and estimating labor hours
4. Save your estimator valuable time by providing him with latest cost data
5. Increase your daily volume and reduce labor costs on the job by adoption of the most economical methods and utilizing some of the new tools that are pictured and described

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Send for your copy of the new Eleventh Edition of THE BUILDING ESTIMATOR'S REFERENCE BOOK today. Then you can take advantage of the many new methods and ideas in it for increasing your profits through better estimates.

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FREE a Copy of the Vest Pocket Estimator

This 220-page 2½ x 5-inch book is not sold separately. It is the most popular vest pocket reference ever used by contractors. Estimating and cost data most frequently referred to is herein presented in condensed tabular form. Rough cost figures on small jobs can be worked out and submitted within a few minutes.
There are a lot of extras built into the Eljer Legation Bath... and every one of them can mean an extra selling point for you. It's easy to show your customers that the Legation's extra features... the convenient end-seat, the flat safety bottom, the low rim-seat... (6" wide, 16" high)... afford extra utility.

These features, along with Eljer top quality and beautiful finishes, make the Legation Bath an important selling extra for you. Begin now to include the Legation, as well as other Eljer Fixtures, in the houses you build. For complete information see your Eljer Distributor or write Eljer Co., Ford City, Pa.

It pays you, it pays us—because we specialize in Plumbing Fixtures and Brass
HI requirements for adequate plumbing in a house will vary. A two or three person family can get along very well with one bathroom. Larger families, or people who do much entertaining, will find that two baths, or a bath and powder room combination are not merely desirable but necessary.

Minimum needs require a bathroom with tub and shower facilities, a kitchen sink, laundry facilities, and at least one outside hose connection. Only in the lowest-cost homes should the kitchen sink and laundry facilities be combined, or should the tub and shower combination be replaced by a shower only.

If there is one bathroom in the house, it should be placed so as to be accessible but not conspicuous. It should be possible to get to the bath without going through other rooms such as a bedroom. Avoid placing the bathroom door so there is a direct view from the living area into the bath.

In one-bathroom houses, a good arrangement is to place the tub in one compartment and the toilet and lavatory in an adjoining one, thus permitting double use of the room.

**Installation Economies**

For most economical installation, rooms having plumbing should be placed close together to avoid long runs of pipe. In a one-story house, the bathroom can be placed next to the kitchen or utility room. In a two-story house, the bath can be placed over the powder room, and the kitchen over the laundry and basement toilet.

The popular ranch-type of house commonly has the kitchen and utility room at one end or at the center of the house, and the bath at the other end. In such cases, the kitchen and utility room should have a common wall, as should the bath and powder room.

**Provision for Future Changes or Additions**

In many instances, owners will feel that powder rooms, basement toilets, or even additional baths may be added later. If such future fixtures are “roughed in”—drain and water piping installed in the wall—the only future cost will be for fixtures and setting, and the expense of tearing out walls will be avoided.

**Water Supplies**

The water-supply system should deliver water to the fixtures at the rate it is needed. Water pressure, pipe size, the number of fixtures in use at any one time—all are factors in determining the water needed.

Water is brought into the house from the city main or well, in underground pipes, to prevent freezing and to protect the pipes. A 1-inch galvanized or lead pipe, or ¾-inch to 1-inch copper tubing will usually provide adequate water under normal city pressure of 30-50 lbs. In cities, a “roundway” will be provided at the property line, at which the water may be shut off by a key passing down through a metal or fibre tube extending up to ground level. A shut-off valve must also be provided inside the foundation wall or in the utility room. The meter, if used, is installed at this point.

Water-supply piping inside the house may be of galvanized iron,
WATER SUPPLY PIPING for tub and shower, lavatory, and closet are shown "roughed in" in the partition. Copper tubing is used for water supply. Waste and vent lines are made with swaged or soldered joints, with screw-type fittings for connections to fixtures.

Access panels should be provided at the supply end of bathtubs, and other valves should be located in relatively accessible locations in case repairs are necessary. Air chambers should be provided for all fixtures to prevent "water hammer" when valves are suddenly closed. All piping should be at a slight pitch to permit draining down of the system to a low point if ever necessary.

Drainage System

Water is forced through the supply pipes by pressure, but drainage of wastes is by gravity. Therefore, all drainage lines must have a pitch to insure proper flow so that wastes are carried out to the street or septic tank. Traps must be provided at all fixtures to prevent sewer gases from getting into the house. These should be accessible for cleaning if necessary. Waste lines must be vented to equalize air pressure throughout the system to avoid siphonage of traps. In climates subject to freezing, the vent stack or stacks extending through the roof must be increased to prevent hoarfrost from stopping the vent, which could permit siphonage of traps.

Some plumbing codes require that kitchen and laundry wastes be passed through a grease interceptor or catch basin to separate out grease and oil. If this is required, separate waste lines must be provided.

Downspouts may be connected to the city sewer, or to a separate storm sewer, which reduces the possibility of water backing up in periods of heavy rainfall. If a common sewer is used for wastes and rain water, the connection of the downspouts to the city sewer should be made beyond the catch basin, and beyond a back-water valve, if this is used to keep water out of the basement. In extreme cases, it may be necessary to install a sump and sump pump to handle the problem of water backing up to basements because the sewers are too high in the street, or because of insufficient capacity.

Clean-out plugs should be provided at proper points in the system. Special
drainage-type fittings should be used throughout to prevent waste material from accumulating.

Materials for the drainage system are often specified by local plumbing codes. The commonly used materials for house sewers outside the house are clay tile, fibre or concrete pipe, and cast iron. Tile is cheapest and most easily installed, but may crack with settling of the ground, permitting roots to get into the pipe and obstruct the flow. Cast iron is most expensive, but is permanent and trouble free.

Inside the house, piping for drainage may be of cast iron, clay tile, or fibre pipe for subfloor sewers, and of cast iron, galvanized steel or wrought iron, or copper, brass, or lead for above-ground piping. Cast iron is most commonly used for 3-inch and 4-inch lines handling toilet wastes, while smaller sizes are galvanized pipe or cast iron.

**Bathroom Fixtures**

Bathtubs are made either of cast iron or pressed steel, having a hard coating of porcelain enamel which is resistant to abrasion and corrosion. Present style is for an apron tub, having a skirt extending to the floor on all exposed sides and end. A roll rim, single-shell type of tub is made for economy installations, and is a great improvement over the old footed tubs. A great variety of styles are made; corner, recess, square, with or without seats, and either white or numerous colors. The 5-foot length of tub is usual, although 4 1/2- and 5 1/2-foot tubs are made. The square tubs occupy a 4-foot square space, and solve many otherwise difficult space problems. A special receptor type of tub permits either showers or sit-down baths and occupies a space only 42 by 31 inches. When used with a corner lavatory, bathrooms can be fitted into a space as small as 6 by 5 feet. However, most building codes specify minimum room areas, including bathrooms.

Cast iron tubs are supported at the back of the tub by 2 by 4's nailed to the studs, or by special hangers. The tub apron supports the front, and wedges are placed under the tub body to keep it from shifting. Pressed steel tubs must be set in sand or grout or supported otherwise.

Designs of modern bathtubs reflect...
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<th>yes</th>
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<tbody>
<tr>
<td>1</td>
<td>Adequate supply of pure water for human use, free from possible contamination at all times</td>
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<td>2</td>
<td>Piping of durable material of sufficient size to supply water at an adequate rate for use</td>
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<td>3</td>
<td>Connection to public sewer, septic tank, or other approved sewage disposal and treatment</td>
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<td>4</td>
<td>Minimum fixtures: water closet and kitchen type sink for dwellings; water closet and one fixture for cleaning purposes in non-residence structures</td>
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<tr>
<td>5</td>
<td>Proper design and installation of drainage system, with adequate provision for clean outs</td>
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<tr>
<td>6</td>
<td>Fixtures of suitable design to guard against fouling and back-siphonage, of smooth, non-absorbent material</td>
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<tr>
<td>7</td>
<td>A water seal trap for each fixture directly connected to the drainage system</td>
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<td>8</td>
<td>Vents for fixtures to provide air in pipes with no danger of siphonage, forcing of trap seals, or aspiration under ordinary use</td>
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<td>9</td>
<td>Vent terminals above the roof line, with increasers to prevent hoar frost or draining of roof water, away from doors and windows</td>
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<td>10</td>
<td>Protection against back flow of sewage</td>
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<td>11</td>
<td>Keeping clogging, deleterious, or explosive materials or substances out of the drainage system</td>
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<td>12</td>
<td>Suitable testing and inspection of plumbing installations</td>
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<td>13</td>
<td>Protection of hot water heating units against over heating, excess pressure, fuel leakage</td>
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<td>14</td>
<td>Adequate lighting and ventilation of rooms having plumbing fixtures</td>
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<td>15</td>
<td>Maintaining of plumbing and sewage disposal systems in a serviceable and sanitary condition</td>
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<tr>
<td>16</td>
<td>Arrangement of plumbing fixtures to be reasonably accessible in ordinary use</td>
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<tr>
<td>17</td>
<td>Installation of fixtures not to weaken structure of building or damage walls, floors, etc. in ordinary use</td>
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Style has a definite place in today’s bathroom design—for the bathroom accessories you choose today will do much to determine the appearance and convenience of your bathroom for years to come.

This new Crystalcrome towel ring is the latest addition to Hall-Mack’s Crystalcrome line of bathroom accessories—and it combines sparkling beauty and sensible utility in a new styling that adds a dramatic touch to bathrooms.

The large stirrup-type towel ring is made of solid, crystal clear Lucite which will not break or discolor—and has a chrome plated base. Two rings—fastened to the wall or door—a “Mr.” and “Mrs.” pair—will add beauty and convenience to any bathroom.

This is but another example of Hall-Mack quality—expressed “STYLE”—another reason why Hall-Mack is the only answer to Quality Bathroom Accessories.

It’s important to you that Hall-Mack is recognized as “the best answer to quality bathroom accessories”—for it means quality materials and fine construction—it means that the accessories you choose will have lasting style and enduring beauty—it means that whatever your taste, whatever your budget—Hall-Mack has the right accessory to supply every bathroom need.

Within four popular lines—Crystalcrome, Coronado, Tempo and China-Vogue—you can select Hall-Mack accessories for every bathroom style and budget!

HALL-MACK COMPANY
1344 W. Washington Blvd., Los Angeles 7, California
7455 Exchange Ave., Chicago 49, Illinois
the constant striving of the industry for the last word in safety, durability, and appearance. Today’s tubs have broad, low, flat rims, so that toilet articles may be placed on the rim near the wall. Bathers may sit or dress on the wide outer rim of the tub. Flat, non-slip bottoms prevent falls while bathing.

**Lavatories**

Lavatories are of two general types: the flat-top style, having the faucets on the same level as the rim of the fixture; and the shelf-back model, having the supply valves on an inclined or vertical ledge. The flat-top style is most economical. Set about two inches away from the wall, it permits cleaning behind it, but the wall should be waterproofed against plaster damage. A variation has the faucets at rim level, but a straight back fitting against the wall for protection.

Ledge or shelf lavatories have space for toilet articles. This style lends itself well to a mirror installation which comes down flush with the back of the fixture.

Lavatories may either be wall hung or supported on legs. In either case, blocking must be built into the wall to anchor the unit. Special brackets give support to wall-hung fixtures, while chrome-plated legs combined with towel bars give graceful support at the front for other styles.

A new development in bathroom styling is the countertop lavatory. These are designed to fit into a counter top of linoleum, glass, laminated plastic, or other materials. Such an installation makes possible combining two lavatories in one counter top for greater utility; also, a dressing table may be added. Extra storage space or hampers below the counter are also a possibility.

Size of lavatories range from 18 by

**TWO LAVATORIES** are set into the continuous curved shelf which also serves as a vanity table. Door at right leads to separate compartment for shower and toilet. Glass panels and fluorescent lighting provide correct illumination and point up modern decor.

15 inches up to 28 by 22 inches and larger. Corner lavatories save space in small bathrooms. Small dental lavatories set a little higher than the regular basin, are recommended by health authorities, and reduce bathroom congestion while taking little additional space.

Faucets are usually supplied with the lavatory. The discharge spout should be at least one inch above the rim to prevent back siphonage. The center discharge type of spout is preferred so that water of the correct temperature may be run for washing.

A stop or shut-off valve at the wall under the lavatory regulates the maximum stream, and permits replacement of faucet washers without shutting off the water for the rest of the house.

All good quality faucets have heavy chrome plate over brass bodies. Only faucets which permit replacement of all wearing parts should be installed.

Standard 1\(\frac{1}{4}\) -inch "P" traps connect the lavatory to the wall. New designs minimize stoppages, and permit easy removal and replacement for cleaning. Polished or satin chrome plating adds to the appearance of the unit.

**Toilets**

Three major types of water closets are in common use; the siphon jet, the reverse trap, and the washdown. The washdown costs the least and the siphon jet is the most expensive. The latter is preferred because it has a deeper water seal, a larger trapway, a more positive flushing action, and a much larger water area. The modern styling of siphon jet bowls adds to the appearance of the bathroom in which they are installed.

The reverse trap bowl, considered a “best buy” in the trade, is the largest selling closet. It has a minimum water seal of 2\(\frac{1}{2}\) inches, rim and jet flushing action, but is not so positive or quiet as the siphon jet.

Any of these types of closet bowls may be used with any type of tank; one-piece, close coupled, or regular wall-hung tanks. The washdown closet, for economy, is made only with wall-hung tanks, but the siphon jet and reverse flush bowls may be made also with close coupled or integral tanks. The close coupled tank generally sets away from the wall and is bolted to the bowl. The integral tank is cast in one piece with the bowl. Both of these are very popular; it is estimated that 70 to 80 per cent of the closets sold today are of the close coupled design.

Flush valves differ from water closet tanks in that the water for flushing is supplied directly from the main, no storage tank being necessary. The flushing action is positive and direct. The flush valve may be adjusted for the volume of water supplied and the duration of the flushing flow. Since no tank is needed, installation is more compact, and these valves are reliable and efficient in operation. Because of the fact that a one-inch supply pipe and good pressure are required for operation, this type of valve is not ordinarily used in home construction.

Closet seats are usually of plastic or plastic coated wood. Painted wood can be used for low-cost installations.

**Showers**

An overhead shower will almost always be installed over the tub. The water and drain are there, and the additional cost of a diverter tub filler and shower head are negligible compared to the convenience of a built-in shower.

Separate shower units may also be installed in a second bathroom, or in the basement powder room. Built-in shower cabinets are available in a
CRANE’S FAMILY “T”

A practical idea for bathrooms that can be adapted in many ways

The “T” Bathroom features decorative woods, cork floors and grass-cloth wall in the dressing-table area, with bathing and toilet fixtures from Crane’s Criterion group.

Here is an example of another Crane service to home builders.

A simple “T” shape partition turns the trick—divides this bathroom into three sections to give 3 bathrooms in 1! All the facilities of the bathroom may be used simultaneously by different members of the family, because sliding doors provide privacy for each section.

The flexible Family “T” bathroom is one of forty-eight rooms in the new Crane “Sketch Book of Ideas,” an important part of Crane’s new service to builders. This remarkable book can be used to help prospective home owners visualize and select new arrangements for bathrooms, kitchens and utility rooms.

In addition, information on room arrangements and decorations is available.

Ask your Crane Branch or Crane Wholesaler for complete details. Crane Co., General Offices: 836 South Michigan Avenue, Chicago 5, Illinois.

COME TO CRANE FOR IDEAS

APRIL 1952
Cabinets and Accessories

The medicine cabinet over the lavatory, standard for years, has developed into a wide variety of bathroom storage units. Cabinets for toilet articles are larger, have bigger and better mirrors, and are also usually fitted with lights for shaving or makeup. Both wood and metal constructions are used. Built-in holders for a variety of sizes from as small as 32 by 32 inches. Prefabricated shower units consist of a concrete or metal receptor which is waterproof and does not require a lead pan or membrane, and metal enameled walls. These are shipped knocked down and may be assembled and waterproofed on the job.

Built-on-the-job showers may be of ceramic or other tile, and require lead pans and waterproofing of walls. Additional support is also necessary to handle the extra weight imposed by these materials.

Shower valves may be part of the tub installation, where the diverter mixer faucet also controls the shower; a simple two-valve set-up leading to the shower head; a mixing valve, where one valve controls both the hot and cold water; or a thermostatic unit incorporating a mixing valve plus automatic temperature adjustment when the flow of either hot or cold water is changed by water demand elsewhere in the house.

Shower doors, both for privacy and keeping the bathroom floor dry, are available in a wide range of styles, degrees of ornamentation, and prices. Stainless steel and etched or frosted glass are typical materials, and an attractive shower door can contribute much to the beauty of a bathroom.

PreFabricated Shower Stall and receptor units may be shipped cheaply in knocked-down form and easily assembled on the job.

The Polished Chrome Holder shown above combines toilet paper holder, magazine rack, ash tray, and shelves for other articles to provide the ultimate in convenience.

For De Luxe Installations, cost terrazzo receptors may be combined with plastic or clay tile in built-in showers.

A Decorative Cast Terrazzo Receptor and glass door are features of this shower unit for corner installations.

Fluorescent lights at the sides, an interior light with door-operated switch, toothbrush rack and razor blade disposal slot are features of the modern medicine chest in metal.

The sound of the bathtub baritone, the flushing toilet, and the gurgling faucet may be minimized in a number of ways. Quiet-flush closets of the siphon jet type are more efficient than others, and cost only slightly more. The bathroom may be flanked by closets to provide dead-air space. Acoustical tile may be applied to the ceiling for sound absorption. The bathroom or powder room should open onto a hallway, rather than a room for use, and this will help in minimizing sounds. Air chambers should be installed in all fixtures to eliminate water hammer, and all piping should be of correct size, properly supported to prevent noises from the water supply.

Good bathroom design will naturally indicate the use of materials for floor and wall coverings suitable to the location. Floors and wall coverings adjoining lavatories, tubs, and showers should be resistant to water and steam. Asphalt, rubber, ceramic, and metal tile all add beauty and durability while providing protection. All surfaces should be easily cleaned. Modern design favors the liberal use of glass and glass products such as structural glass and glass block.
Shelf-back lavatory, porcelain-on-steel Model L-2018 has a bowl of generous capacity with a deep apron at front and sides that creates an unusual smartness in style. May be wall-hung or installed with legs as illustrated.

AllianceWare porcelain-on-steel BA5 bathtub combines three important selling features—(1) an attractive panelled front (2) a wide seat with roll-rim and (3) a convenient height of 15 1/2 inches.

For details of these AllianceWare units, write for complete specification sheets.

With the recent addition of vitreous china closet combinations of recognized quality to the AllianceWare line, you can now install a complete AllianceWare bathroom in any of four decorator color selections—blue, pink, green, and suntan—as well as white.

With stainproof surfaces, modern styling and choice of units matched in color, AllianceWare also possesses practical details of construction and ease of installation that win the praise of architects and builders everywhere. Builders who plan quality homes of long-lasting attractiveness find AllianceWare fixtures offer both builder satisfaction and owner satisfaction.

AllianceWare, Inc. • Alliance, Ohio
Bathtubs • Lavatories • Toilet Combinations • Sinks

April 1952
THREE PERSONS can use this five-fixture bathroom at the same time because of partitions and sliding doors. Under-vanity area provides in-bathroom storage.

ALL PLUMBING FOR BATHROOM, powder room and kitchen is concentrated back-to-back for economy. Net result here is bath-and-a-half at small extra cost.

DIVISION OF THIS BATHROOM with a sliding door and installation of two lavatories provides a separate powder room. Glass block separates vanity, tub.

LOCATION OF THE POWDER ROOM directly below the bath economically permits both closets to use one stack.

(Continued from page 342)
"Luxury homes need electric water heaters,"

These rambling, farmhouse-style homes, built by Mr. Robert Stewert in Encino, California, are in the $35,000 to $50,000 price class. To shorten hot water lines, one of the two Electric Water Heaters is located in a corner of the garage.

SAYS CALIFORNIA BUILDER ROBERT STEWERT

"The people who buy my homes want luxurious but informal living," says Mr. Stewert. "That's why I usually include two Electric Water Heaters in each house. They not only provide automatic hot water and plenty of it—but I can install them efficiently, to avoid long pipe runs and insure economical operation. I'm able to do this because the Electric Water Heater has no flue or vent, and can be installed anywhere. Other features which customers like are the cleanliness and long life of the Electric Water Heater. It provides the kind of service demanded today not only in upper-bracket homes, but in every type of home."

Equip Your Homes with electric water heaters

THEY'RE WHAT PEOPLE WANT!
The inner tank of every Rheem Water Heater is fully tested at a water pressure twice as great as ever needed for normal use. It has to be perfect before it leaves the factory!
A COMPLETE SELECTION OF WATER HEATERS FOR THE HOMES YOU ARE BUILDING

What type of water heaters do you want for the homes you are building? Gas, electric or oil? What capacities? 20, 30, 40 or 190 gallons? An upright or a table-top electric? The finest quality Rheem Imperial with a 10-year warranty, a Rheem Standard or the Rheem Custom with a five-year warranty? Rheem has them all!

And Rheem has the national sales and service organization to make Rheem warranties mean everything they say! Rheem is in business to stay.

RHEEM MANUFACTURING COMPANY, General Sales Offices, 570 Lexington Avenue, N. Y. 22, N. Y.
Manufacturing Plants in 12 Cities Around the World

You can rely on Rheem World's Largest Manufacturer of Automatic Water Heaters

No other manufacturer offers such a wide selection of models. No other manufacturer offers such high quality at such low prices. And Rheem's large-scale, hard-hitting national advertising—built around the Pressure-Proved theme—makes Rheem a name that is highly acceptable to new home prospects. Rheem represents a plus value that will help make your homes easier to sell. See your Rheem Contractor NOW! Get the complete story on why Rheem is the best buy for builders!
LUCKE LEAK-PROOF BATH-TUB HANGER

For Housing  Specify  LUCKE
For Hospitals
For Homes
Leak-Proof Bath-Tub Hangers

No Leaks  No Cracks  No Repair Expenses

Outstanding Features
1. Bolts in hanger where necessary.
2. Filler to seal joints against leaks.
3. Two nails, screws or bolts at every stud.
4. Filler in groove between tub and hanger.
5. Perforations as a base for wall materials.

The Modern Way To Prevent Leaks
For Trouble-Free Bath Tub Edges
There is no excuse for cracks or leaks or repair expense in good building. LUCKE Bathub Hangers are specified and used by leading architects and builders to overcome this problem. Lucke Hangers build tubs into walls. Tub rests securely in hanger along each wall.

Sold by Leading Plumbing Supply Houses

Manufactured by
W. B. LUCKE, Inc.
Wilmette, Illinois

Only BURKS WATER SYSTEMS HAVE Life-Lok

Write for story of BURKS

DECATURE PUMP COMPANY
78 Elk Street, Decatur 70, Illinois

Kitchen and Utility Fixtures—Sinks

Modern sinks range in size generally from 42 to 96 inches in length, and have more than ample workroom if their size is chosen according to the family's needs. It is desirable to install the two-drainboard sink if space permits. The double bowl sink, having separate compartments for dishwashing and rinsing is preferred by housewives.

DOUBLE COMPARTMENT SINK makes for efficiency in dishwashing. Spray attachment shown in use facilitates removal of food wastes from plates and rinsing after washing.

Sinks are typically of porcelain-enamed steel or cast iron, but may also be of stainless steel. Stainless steel is more subject to scratching by abrasive cleaners than is porcelain, but makes a beautiful appearance if properly cared for and will not chip from impact.

Drainboard sinks may be obtained in widths of 42, 48, 54, 60, and 66 inches. For sinks built into a counter top, a 24 by 21-inch bowl is about minimum, while a 30 by 21-inch size gives better work room. Double-compartment sinks for counter top installation are in 32 by 21-inch and 42 by 21-inch sizes. Cabinet bases of wood or metal can be had for sink installations in lengths of from 42 up to 144 inches. Longer units include cupboards or drawers in addition to under-sink compartments. Special brackets and drip moldings are available for mounting sink bowl units in any type of custom-built counter top.

Individual sink cabinets are supplied by manufacturers in both single and double drainboard, single and double bowl styles, to match and harmonize with other cabinet and counter installations.

Sinks which do not have garbage (Continued on page 350)
NEW STANDISH SHOWER BATH
42" x 36"

for homes, apartments, hotels, motor courts

Here is a space-conserving bath, practical for the needs of an entire family. Wider than the average bath, with flat bottom, it is roomy for showering and suitable for adult tub bathing. The low front makes it especially useful as a child's bath.

The Standish is 42" long, 36" wide at the center, 34" wide at the ends, 14" high. Standing area at the bottom is approximately 35" x 26". The bench rim is 5" wide.

The Standish matches the popular Kohler Cosmopolitan. The lustrous enamel is fused to non-flexing iron cast for strength and rigidity. The combination fitting with Niedecken Mixer is chromium-plated, affords easy control of water temperature.

Kohler Co., Kohler, Wisconsin. Established 1873

KOHLER OF KOHLER
PLUMBING FIXTURES • HEATING EQUIPMENT • ELECTRIC PLANTS • AIR-COOLED ENGINES • PRECISION CONTROLS
APRIL 1952
for suburban homes beyond the water mains

F&W MEANS
F & W

F & W Pump Interchangeable from Shallow to Deep Well
- If falling water level is a problem for any of your customers you can protect them dependably, and at the same time assure them outstanding performance at low cost! The F & W Multi-Purpose Jet Pump (above) can be changed from shallow to deep-well operation simply by moving the jet off the pump down into the well. And there are no extra packages or parts to buy. Whatever your customers’ needs there’s an F & W Pump to meet them exactly, offering important advantages in long-life, reliable service, and minimum maintenance. Remember . . .

Versatile

Laundry Trays
Although there are available combination sink and laundry tray units which have two compartments, one for dishwashing and a larger one for laundry use, these are recommended only for reasons of greatest economy or space-saving. Typically, a laundry tray will be provided in the basement or utility room, together with a water heater and water softener in localities having hard water conditions.

Laundry trays are made of enameled cast iron, earthenware, or cement composition. One, two, or three compartments are supplied, with single-compartment units being especially suited to installations in conjunction with automatic units.

(Continued from page 348)

(Continued from page 354)

WATER SOFTENERS soon pay for their initial costs in savings on soap and clothes. The unit above is completely automatic, and requires only a few minutes for regeneration

Water Softeners
Water softener units are a necessity in many areas. Any water having more than three grains of mineral salts per gallon is considered hard enough to require softening. A softener is an added sales feature for a home, and will soon pay for itself in savings. It is estimated that clothes

Cleans Pipes, Drains, Sewers Simply

HYDRAULIC WATER RAM

Good news for every maintenance man and operator. Positive sanitary maintenance with this modern plumbing tool. No rods, no electric cables, no chemicals. Clears the toughest sewer, hardest sticky sink line, toilet. Clears them CLEAN IN MINUTES. Eliminates rust, corrosion in hot water faucets, coils, etc. Restores pressure without disturbing faucets or risers. GET THE FACTS concerning this simple, scientific principle of hydrostatics.
Build lasting value into your homes with Briggs Beautyware in color

It's the "something extra" in Briggs Beautyware formed steel plumbing fixtures that means plus value to home buyers! They'll be impressed, of course, by the striking modern lines and stunning decorator colors of this superb plumbing ware when first they see it. But there's extra quality in Briggs Beautyware that isn't visible at a glance—extra quality that assures modern home owners of beauty and satisfaction that won't wear off.

For Briggs gives them a special acid-resistant layer of finest quality porcelain enamel which fuses with the layers beneath, forming a solid, durable mass with a permanent luster. That's why Briggs Beautyware retains its "just like new" look through the years. And that's why so many thousands of American home owners are sold on Briggs Beautyware right now—and on the builders who have had the foresight to install it in their homes!

All Briggs Beautyware is stain-proof—and the rigid formed steel construction eliminates all unnecessary dead weight. Remember this when specifying bathroom fixtures for your homes. Give your customers a bathroom they'll be proud of—with Briggs Beautyware fixtures that always look like new!

BRIGGS MANUFACTURING COMPANY • 3001 MILLER AVENUE • DETROIT 11, MICHIGAN

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EVERYONE LIKES BRIGGS COLOR!

The four famous Briggs Beautyware colors are truly beautiful—non-fading and so reasonable! Colored fixtures in complete sets cost only a very little more than plain white. They save you money—increase your profit!

Like the famous formed steel fixtures, Briggs Beautyware vitreous china lavatories and closets are products of the finest craftsmanship and designing skill to be found in the plumbing ware industry. The permanent luster and attractive pastel colors of sparkling Briggs Beautyware are well known among builders alert to the advantages of modern materials and methods.
Build lasting value into your homes with **BRIGGS Beautyware** in color

**STAIN-PROOF!**

**DURABLE!**

**NON-FADING!**

BRIGGS VITREOUS CHINA FIXTURES ARE TOPS FOR QUALITY, TOO!

It's the "something extra" in Briggs Beautyware formed steel plumbing fixtures that means **plus value** to home buyers! They'll be impressed, of course, by the striking modern lines and stunning decorator colors of this superb plumbing ware when first they see it. But there's **extra quality** in Briggs Beautyware that isn't visible at a glance—extra quality that assures modern home owners of beauty and satisfaction that won't wear off.

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FOR ABOVE...

Present government regulations still allow you to install copper water tube for hot and cold water lines.

Chase Copper Water Tube's resistance to corrosion makes it the number one choice for domestic water lines.

OR DOWN UNDER

Underground piping of Type K Chase Copper Water Tube resists the double corrosive action of earth on the outside and water inside.

The easy-to-install coiled lengths of 40, 60 and 100 feet require fewer fittings...and its soft temper permits bending around obstructions.

...it's Chase Copper Water Tube

Since government regulations do not prohibit the use of copper for domestic hot and cold water lines, or underground service lines, it's wise to plan the use of Chase Copper Water Tube for these two important types of installation.

Chase Copper Water Tube is made in hard and soft tempers for use with both solder-joint and flared fittings.

Rustproof, corrosion resistant, easily worked, smooth interior for better flow—these are some of the reasons why Chase Copper Water Tube is ideal for long life, fine service.

Chase BRASS & COPPER

WATERBURY 20, CONN. SUBSIDIARY OF KENNECOTT COPPER CORPORATION

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AMERICAN BUILDER
For 51 years, Universal-Rundle has searched for and found better ways to make bathroom fixtures more beautiful, more efficient, more lasting.

Today, you can look to Universal-Rundle for the newest in smart, modern design that will sell your customers. And you can look to Universal-Rundle for long-lasting, unobtrusive performance that will build good-will for you.

To help you sell, there are full-color Universal-Rundle advertisements in leading magazines such as The Saturday Evening Post and Better Homes & Gardens. These advertisements are telling your customers about these U/R features:

- **Whitest white**—by actual scientific tests!
- **Matched colors**—by U/R, first maker of colored fixtures. Lovely colors, matched closer than the human eye can see!
- **Strongest bond** between surface glaze and body gives highest resistance to chipping!
- "Harder than steel" surfaces that are easy to keep clean, scratch-free, sparkling bright!

Write today for the new U/R catalog, showing the complete line of bathroom and kitchen fixtures—plus plans, drawings, specifications and helpful information. (See the U/R line in Sweet's Builders File, also.)

**FAMOUS "FIRSTS" From UNIVERSAL-RUNDLE!**

- **FIRST**—with colored fixtures!
- **FIRST**—with the one-fire Hi-fired process which gives harder-than-steel surfaces and lifetime bond between surface glaze and body!
- **FIRST**—with the patented Rim-Jet flushing principle!
- **FIRST**—with concealed front overflow!
Few other conveniences in the home are used more or afford the architect, builder or contractor greater reward than when Lawson cabinets of adequate size are installed.

Suggested specifications
Lawson 4132 Bathroom Cabinet or equal—or—

- ONE-PIECE DRAWN SEAMLESS STEEL BODY—BONDERIZED AFTER FORMING for rough opening 14 x 18 x 3½”.
- Mirror shall be 16 x 22” Plate Glass conforming to National Bureau of Standards Specification CS27-36, with Polished Stainless Steel Frame.
- Door shall be supported by full length White Enamel Piano Hinge.
- Cabinet shall be supplied with 2 Glass Shelves and Stainless Steel removable and adjustable Shelf Supports. Bar Type Door Stop. Razor Blade Disposal Slot.
- Finish—Baked White Enamel.

Write for catalog of Lawson Bathroom Cabinets, Lavatory Mirrors and Chrome Accessories.

THE F. H. LAWSON CO.
801 Evans Street
Cincinnati 4, Ohio
Est. 1816
WORLD’S LARGEST BUILDERS
OF BATHROOM CABINETS

### Plumbing Fixtures, cont’d

#### Standard Weight Pipe

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(Continued from page 350)

washed in hard water last 20 to 40 per cent less. More soap is used with hard water, and minerals will eruct pipes, fixtures, and faucets, cutting down on available water supply and often resulting in large repair bills. Most water softeners use the Zeolite process, in which the calcium and magnesium salts that make water “hard” are absorbed as the water passes through a zeolite-filled tank. When the zeolite is saturated with minerals, it is then ready for use. Softeners may be installed permanently, or may be obtained on a service basis, in which a portable unit is installed in the line, and exchanged at periodic intervals by a service man. Installations should be made so that water for lavs, cooling units or other uses which do not require soft water should be taken from supply lines ahead of the softener.

**Hot Water Heaters**

Domestic hot water may be heated either by units built into the house heating system, or by separate gas, electric, coal, or oil heating units.

Electric heaters have a relatively large storage capacity. The operating cycle assumes that water will be heated in the storage tank at night, during the time of low power demand on the utility company’s facilities. The hot water is then held in storage in a well-insulated tank for the next...
It's the talk of the home construction field — new low-cost Vitrified Clay Bell and Spigot Pipe heating ducts for the new basementless homes. Clay is the only duct material that will last forever. It's chemically inert — unaffected by lime in the concrete, or by acid soil conditions or furnace gases.

Clay Pipe heating ducts go down to stay ... the floor-slab need never be torn up for costly, inconvenient repairs. And its low original price makes Vitrified Clay Bell and Spigot Pipe ideal for the small builder — especially in these days of high costs and heavy competition.

The Clay Pipe duct system combines all the advantages of direct and radiant heating ... delivers warm air to registers at the same time as it radiates heat through the concrete slab. It's been proven in literally hundreds of successful home installations.

Convenient lengths are easily handled ... quickly laid in place by low-cost labor ... and a complete assortment of fittings prevents on-the-job delays. You'll want to investigate all the amazing advantages of this new, low-cost home-heating system. Write for details today!

SEND YOUR REQUEST FOR MORE INFORMATION TO THE REGIONAL OFFICE NEAREST YOU

NATIONAL CLAY PIPE MANUFACTURERS, INC.
206 Connally Bldg., Atlanta 3, Ga.
100 N. LaSalle St., Rm. 2100, Chicago 2, Ill.
701 Ninth and Hill Bldg., Los Angeles 15, Calif.
311 High Long Bldg., 5 E. Long St., Columbus 15, Ohio

APRIL 1952
Say goodbye to the hard-to-get lead pan for Tile Showers

FIAT PRECAST TERRAZZO RECEPTORS

Save money...Save time...Make a better tile shower floor...

One piece slab construction gives a lifetime leakproof floor.

Available for prompt delivery
See your plumbing contractor

STANDARD SIZES:
Square type 32" x 32" — 36" x 36" — 40" x 40"
Corner type 36" x 36" — 40" x 40"

The Fiat one piece precast receptor slab will not be affected by settlement of the building as would the old-fashioned "multi-layer" construction of fill, lead pan, grout and tile. The rustproof metal receptor flange encases the tile walls making a leakproof connection.

FIAT METAL MANUFACTURING COMPANY
Three Complete Plants
(Chicago area plant) Franklin Park, Ill.
Long Island City 3, N. Y. Los Angeles 33, Calif.
In Canada—Fiat showers are made by Porcelain and Metal Products, Ltd., Orillia, Ontario

AUTOMATIC LAUNDRY UNIT and hot water heater are here shown located on the service porch of a ranch type house

(Continued from page 354)

day's use, and enables an attractive rate to be offered for the electricity used. Such units should be of ample capacity, so that more than average use of hot water will not require the use of electricity during the day at higher rates.

Gas hot-water heaters are supplied in sizes to handle the needs of all sizes of families, and with different tank and insulating materials. A 30-40 gallon storage capacity is suitable for the average family of three or four. Tanks are of galvanized steel, porcelain-lined steel, or monel metal, and are priced and have greatest durability in that order. Insulating material is generally glass wool or fiberglass. Automatic thermostats turn the gas on and off to keep water at a constant temperature, usually 140 degrees, for most efficient use. An adjustment is available so that the user may set the water temperature according to individual preferences. Safety valves are necessary to eliminate hazards in the event of failure of gas pressure in the city mains. Heaters for use with liquid petroleum gas such as butane or propane must be fitted with valves giving a complete shut-off in case the pilot light fails. Acceptable units are approved by the American Gas Association and are so marked.

Good Installation Practices

The plumbing installation will customarily be made by the plumbing contractor, who will be a licensed master plumber. While it is his responsibility to see that the installation
is properly made, in accord with local codes and requirements and in a workmanlike manner, the builder should also see that the specifications for plumbing meet these requirements and that the work is installed in line with the specifications. The cutting of corners, such as installing used pipe or fittings, using standard instead of extra heavy soil pipe, supplying valves or faucets of lower quality than specified, etc., should be guarded against. The best insurance for a good installation is the reputation of the plumber doing the work.

**Plumbing Codes**

Because of the importance of good plumbing to good health, it is probable that no other phase of building construction is so rigidly controlled by code requirements. Variations, both minor and wide, will be found throughout the country, but the following provisions, in one form or another, may be considered typical of the requirements for good plumbing installations:

- Adequate supply of pure water; adequate piping of suitable materials; fixtures of suitable materials and correct design; drainage system of good materials and design, properly installed to prevent clogging; provision for cleaning drainage system when needed; proper traps and venting of system; adequate sewers or sewage disposal system; proper inspection and testing of new installations; protection against contamination by back siphonage and against back flow of sewage; and adequate light, ventilation and space in rooms having plumbing fixtures.

The adjoining check list will enable the reader to evaluate his own local code in terms of accepted standards.

After installation, the plumbing system should be tested under city pressure or greater, and any required local inspections should be made. No leaks of any sort should be permitted in either the water supply or drainage systems, with the assumption that "they will tighten up or rust up in a couple of days."

**Maintenance and Repair**

The owner should be instructed as to the location of shut-off valves for the main coming in from the street, and riser valves for kitchen and bath if these are installed, so that he may shut off the water if necessary. He should be cautioned against letting any objects get into the waste lines which might cause clogging or stoppage. The owner should also be provided with manufacturers' instructions for hot water heaters, dishwashers, automatic laundry units and dryers.

---

![Case Water Saver Closet Combination](image)

**Features in favor start with LOW COST**

A dozen features approved by builders and buyers make the Case Camel® the perfect closet for low-cost and medium-priced construction. First, its surprisingly modest price. This closet of Case quality vitreous china is famous for low water consumption, an increasingly important factor of economy these days. It flushes powerfully yet quietly. Special reverse trap bowl with large opening and water surface make for dependable action and cleanliness. Tank bolts directly to bowl with one bolt connection, stands free from wall. High grade trim of special design and chrome plated exposed fittings add to the sales appeal of your bathrooms equipped with the Camel. In 26 colors, and white. See the complete line of Case closets and lavatories.

*Made by the originators of the ONE-PIECE Water Closet*
"I fell in love with the house when I saw the ELECTRIC RANGE!"

Of course, the range was just one of the things I liked—but I realized it would give me more time to enjoy my home, because I'd spend less time in the kitchen. That's how the Electric Range helped me fall in love with the house.

"We've found that potential home buyers are interested in electrical equipment," says MR. OSCAR DREISEN, of Dreisen & Freedman, Silver Spring, Maryland. "We know that because there were traffic jams when we opened our model house, and fifty houses were quickly sold.

"Naturally we include Electric Ranges in the kitchen, because this is an electric home. The Electric Range gives the home buyer cool, automatic cooking—the kind that's fast, economical and clean. All our kitchens are electric!"

- Kitchen equipment in the Dreisen & Freedman homes includes electric refrigerator, electric dishwasher-sink with food waste disposer, and ventilating fan. And the range? Like all the other equipment—of course, it's ELECTRIC!

- Prices of these all-electric homes range from $12,750 to $14,250, depending on whether or not they have basements. They are three-bedroom ranch-type, with five different exterior designs to choose from.

EQUIP YOUR HOUSES WITH ELECTRIC RANGES

ELECTRIC RANGE SECTION
National Electrical Manufacturers Association
155 East 44th Street, New York 17, N. Y.

ADIRAL • COOLERATOR • CROSLEY • DEEPFREEZE • FRIGIDAIRE • GENERAL ELECTRIC • GIBSON
HOTPOINT • KELVINATOR • MONARCH • NORGE • PHILCO • UNIVERSAL • WESTINGHOUSE
FOR years the kitchen has been recognized as the focal point of interest for women considering the purchase of a home or thinking about modernizing an existing structure. Public interest is particularly high in the latest types of dishwashers, garbage disposal units, automatic lavatories, integrated ranges, ventilating fans and other devices. Successful home builders learned years ago that a satisfactory kitchen in a house offered for sale not only does a great deal to reduce sales cost, but serves to make the ultimate purchaser happier and better satisfied.

**Planned Efficiency**

Time and motion studies of kitchen efficiency have developed new concepts of kitchen planning. Work and storage space for each of the main functional areas in the kitchen have been determined as being a minimum of 36 inches of work and storage space by the refrigerator, 18 inches by the range, and 36 inches by the sink, with 18 inches on either side of the sink bowl. These figures are based upon studies showing where food and utensils should be kept at point of first use. During a test preparation of 84 meals, one study revealed that food and tools were used first at the sink 1,057 times, at the range 810 times, and at refrigerator 2,806 times.

Half the walking involved in preparing the meal is between range and refrigerator. Because more trips are made from dining area to kitchen during clean-up than in serving, the door to dining area should be between sink and refrigerator, or at least closest to sink.

**Estimating Kitchen Storage Space**

The basis for determining the correct amount of storage space necessary in a kitchen is the number of bedrooms in the house. One person per bedroom, plus an additional person for the master bedroom is considered normal occupancy.

Studies have proved that six square
feet of storage space in wall cabinets is required for each permanent resident of a house. To this must be added twelve square feet for entertaining and accumulating.

Base cabinet storage is measured on a lineal foot basis. As a general rule, base cabinets should occupy all space beneath the wall cabinets not already occupied by the range, sink, refrigerator or dishwasher.

If there is sufficient wall storage space, there will usually be adequate base storage. Thus, in a two-bedroom house there would be six square feet of wall cabinet space for each person or 18 square feet. This, plus the 12 feet for entertaining and accumulation, totals 30 square feet of wall cabinet storage space.

In some cases window locations limit the amount of wall space available, although there would be plenty of base cabinet space. In such cases the difference should be made up by installing another wall cabinet, a tall shelf cabinet or a storage closet elsewhere in the room, without a base cabinet to correspond with such a unit.

Lengths for Counter Areas

Actual practice and research studies have revealed there are definite maximum and minimum lengths for all counter areas. There should be not less than four and a half nor more than five and a half lineal feet of counter space between the refrigerator and sink. There should be no less than three, nor more than four lineal feet between the sink and range.

There are variations and additions to these basic principles. Snack bars are frequently extended out from the wall into the kitchen or at the end of the installation. In large kitchens, islands are sometimes used to save steps.

Clearance Dimensions

A clearance of 18 inches is considered desirable between the counter surface and bottom of wall cabinets. Wall cabinets located over the range should have a clearance of 22 inches above that unit for best results.

Major appliances and cabinets are from 24 inches to 28 inches in depth. To clear such equipment, a door opening should not be less than 30 inches from the corner. In cases where a range is adjacent to a door, a clearance of 48 inches is desirable. The distance between a window opening and a corner should be a minimum of 15 inches because standard flat wall cabinets are about 13 inches in depth. The underside of window sills should be not less than
THREE BASIC KITCHEN ARRANGEMENTS commonly used today offer many variations in providing for efficient food handling and serving. A breakfast bar is located in the utility room immediately behind the kitchen sink and counter in this plan. Direct serving is permitted by opening in wall below ceiling-hung cabinets. Folding door separates kitchen from dining room. Laundry is a compact arrangement with tray, washer, and dryer in sequence for easy operation.

This U-shaped kitchen permits easy serving to lunch bar while keeping traffic path open from utility room to dining-living room. Refrigerator at (A) lines up in sequence with food preparation counter area and sink at (B). More counter space and range at (C). Vent fan is provided to remove cooking odors, steam, and excess heat.

With a garden on the inside as well as outside the house, the combination kitchen and dining area of this house is designed to combine beauty with efficiency. Kitchen and laundry are combined in one room, but with refrigerator, sink, and range lined up in sequence in one "L" and washer, sink, and dryer in sequence in another "L" in opposite corners of the room. Range has extended counter area all around for easy serving and collecting of dishes.

44 inches from the floor to provide enough space for backsplashes.

Arrangements

There are four basic types of modern kitchen arrangement: the U-shaped, the L-shaped, the one-wall type, and the corridor type. The orthodox "U" layout is usually found to be the most efficient. By placing the sink on the center wall, preferably under a window, steps are saved in working from one area to the other. This layout also lends itself to plans which call for breakfast nook, meal planning centers, and highly desirable extra cabinet and counter space.

The "L" shape is compact and efficient when storage, preparation and cooking centers are in correct sequence. The opposite two walls in such kitchens are open for other purposes—built-in breakfast nooks or laundry set-ups being most common.

Lighting for kitchens is receiving more consideration, with the trend towards fluorescent fixtures located above sink and under wall cabinets, with indirect ceiling light, and ceiling flush-hung spots to provide light for special areas. Provision should be made for wiring sufficient to accommodate the host of modern electrical appliances including toasters, grills, irons, and similar units. Line capacity is important, as a breakfast involving toaster, grill for eggs and bacon, and electric coffee pot may use as much as 4,000 watts.

Floor and wall coverings should be selected which are durable, attractive, and easily cleaned. Seek advice of experts before determining color. Follow manufacturer's directions in all installations.

Most important in kitchen planning is the determination of the exact inside dimensions of the kitchen and standard equipment in relation to proper location of equipment, to avoid odd spaces or corners which
COMBINING KITCHEN WITH LAUNDRY AND PLAY AREA
for children, this layout shows clearly the relation of
service units, separation of laundry from kitchen area
proper, and easy access to lunch bar

A KITCHEN conveniently arranged to fit into harmonious relationship with other living
area of the house. Snack bar is of wood, as are kitchen cabinets which harmonize
with dining area furnishings. Inlaid linoleum floor carries motif of modernism and
efficiency into dining area, while L-layout of kitchen allows plenty of space for traffic
through kitchen to rear door and utility room.

Getting Into Remodeling

Modernization or remodeling of old kitchens offers attractive sales opportunities for dealer-contractors. Alert builders have long recognized that remodeling service enables them to contact new clients, keep in touch with established customers, and maintain sales promotion for their own business.

Some builders have hesitated about going into kitchen remodeling because they felt that kitchen appliances were too technical. However, new planning aids such as miniature appliance kits and manuals containing standard specifications and procedures have been developed by manufacturers. These take the guesswork out of design and layout, and the whole plan may be discussed with the customer and changes made with models before any work is begun.

Prepare a sketch of the existing kitchen, showing the location of the windows and doors. Start at one corner and continue around the walls, giving the location of all the openings. Show the dimensions from corners to door or window casing, as well as over-all width of doors and windows including trim. As a check for these figures, measure the entire length of each wall from plaster to plaster. Height of window sill from floor, height of window including trim, width of trim around doors and windows, and the over-all height from floor to ceiling are essential. Of extreme importance is the direction of the swing door. The nature of the room accessible from the door should be noted, as this information

(Continued on page 264)
Cabinet manufacturers from coast to coast are adapting their specifications to the installation of Chambers waist-hi GAS Built-Ins. The typical arrangement shown here is by Belwood Kitchens.

It's no mystery why women go for the principle of Chambers waist-hi GAS Built-Ins. They are keen for this most modern development in automatic cooking. They enjoy the freedom from stooping, bending, and lifting. They like these units because they can be installed anywhere in the kitchen.

Leading kitchen-cabinet companies have been quick to recognize this new kitchen trend. They now provide base and wall cabinets to fit in with Chambers Built-Ins. (We'll send you their names and specifications, on request.) Modern streamlined kitchen cabinets together with Chambers waist-hi GAS Built-Ins transform workshop drudgery into a modern dream of efficiency.

Here is a vast opportunity for alert designers and builders. Women prefer Chambers Built-Ins not only because they represent a new trend in kitchen design. They also represent a new way of cooking that saves food, flavor, time, fuel and labor. Only Chambers "In-A-Wall Oven" Cooks with the Gas Turned off. Only Chambers offers a choice of oven doors in stainless steel or seven decorator colors. No other line of cooking equipment offers you such flexibility in kitchen design, or provides your clients with this World Famous Cooking Performance.
is pertinent to the kitchen planner. Location of the water source, radiators or registers (over-all size) is also of importance. Any unusual conditions should be noted.

If the present appliances are to be retained, list the dimensions of range and refrigerator. The planner will also need to know the number of children and adults in the family, the amount of entertaining to be done, and the direction the kitchen faces. Before working on this information, or before sending it to the manufacturer's planner, a re-check on notes and measurements should be made.

Specialties

The installation of specialties or features is part of the basic arrangement of the kitchen. These features are designed with both practical and ornamental functions in view; thus ornamental shelving over the range with curving valance may also be practical with concealed lighting and space for seldom-used utensils.

In many modern kitchens the distance between work-counter top and the underside of wall-hung cabinets has been increased. This reduces head bumping and permits installation of small intermediate shelves for condiments or other small articles.

Some kitchens feature a built-in desk or knee-hole space for the housewife to use in planning menus, letter writing, and telephoning. Window sills may be extended beyond normal depth to provide for potted plants, and glass shelving may be built into windows for the same purpose.

Ranges and sinks which are used in a peninsula arrangement frequently have built-in cabinets in back of them with shelves facing a dining or living area immediately adjacent. Special attention may be paid to backsplash around work areas, with tile or plastic material affixed to walls to the height of a foot or more. Sliding door cabinets and vertical storage compartments for trays and pot lids are other desirable features of cabinet construction which call for special planning in advance.

Home builders find there should be no skimping on kitchen equipment in figuring costs. An over-all increase of ten per cent in the cost of kitchen units would add only a small amount to the total cost of the house, and the sales appeal of a well-equipped kitchen cannot be overlooked.

Built-Ins and Fixtures

The snack-bar and breakfast nook have established themselves as almost standard items. The choice between a snack-bar or built-in seat will be dictated by the space allotted to the kitchen, owner preferences, size of the family, and the type of family activities to be considered.

The snack-bar may be combined
SNACK BAR built in close to range for convenience in serving.

BUILT-IN LOUNGE-TYPE SEAT covered with leather-like plastic material is washable.

THIS SNACK BAR is built onto back of sink cabinet, makes serving and collecting dishes easy.

with ceiling-hung cabinet units to form a pass-through between kitchen and dining room, giving the illusion of more space. It is usually more economical than the built-in seat unit. Families with several children find it ideal for quick breakfasts and after-school snacks.

The built-in breakfast nook is more expensive. Although there are some units available on made-to-order basis, it is more common to have the breakfast nook built to order if the contractor does not wish to do the work himself. More space is needed, but the comfort of upholstered seats and the conviviality of facing people across the table have a wide appeal.

Table tops for both types are usually of laminated plastic, but may also be of asphalt tile or linoleum; stainless steel is sometimes used for stack bars doubling as a pass-through unit.

Cabinets and Sinks

Modern kitchen cabinets of wood or metal are designed as integrated units which harmonize with sink, range, dishwasher, and refrigerator. They are available in a great variety of sizes, and will fit practically any space. Filler blocks space out odd dimensions, and the "custom look" may be had at low cost. Cabinet units may be shipped either knocked down or pre-assembled, unfinished, or already painted.

Special units for corners, under and over sink spaces, and projecting ends make installation problems simple. Ready-made cabinet units are often combined with a made-to-fit counter. Three-quarter inch plywood is covered with laminated plastic or linoleum to provide an uninterrupted work space over the whole cabinet and sink area. The kitchen sink is the basic unit around which the rest of the equipment is planned and built. Its size will depend on the over-all size of the kitchen, its proportions, and plan for equipment arrangement.

The present trend is for the sink built-in as an integral part of the kitchen cabinet work. Cabinet sinks are made by manufacturers in a full range of sizes and styles, and sink bowl units are also available in a complete range for installations into built-in cabinets. Faucets are of the mixing type, having a swinging spout for directing the water for washing or rinsing (double compartment sinks may require a longer than standard spout). In all except the most economical installations, a spray for rinsing is a part of the faucet assembly, with a built-in diverter valve supplying water to the spray whenever used. A faucet having provision for introducing a detergent into the spray for washing has met with some popularity.

Ranges

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Ranges

Both electric and gas ranges have kept step with the advances in design and construction of kitchen fixtures and appliances. Modern units harmonize with other appliances. Finishes are heat resistant and easily cleaned. Improved insulating materials make cooking cool work even on the hottest days.

In many sections of the country, the kitchen range is being considered as built-in equipment, which will permit its inclusion in the mortgage—a valuable sales aid.

Sizes range from small four-burner units with underneath oven, for minimum space and cost, up to six- and eight-burner models with two ovens and broilers. A recent innovation is the built-in-the-top griddle for frying eggs, bacon, pancakes, etc. Built-in lights are often desirable and many units feature timing units that will turn the heat off at the end of a given time, or even start and stop the stove at specified times.

A new design feature is the construction of both electric and gas stoves in modular units which may be arranged in any desired combination of units. Burner units may be installed into counter tops. If desired, two four-burner units may be placed with counter space between. Oven units may be combined with drawers to set the oven at any desired height. If desired, the oven may be located away from the cooking surface top. Greater freedom in kitchen planning is thus possible, as designers are no longer limited by the package size of the conventional range.

Wiring for electric ranges must be strictly in accordance with code re-
TWO OF MANY DIFFERENT MODELS of gas and electric ranges available. Range (A) has 23-inch oven, is a 30-inch unit. The heat-treated glass broiler is said to be smokeless. Range (B) has porthole windows in both baking oven and broiler, color top in a variety of pastel shades with standard white sides, and concealed griddle. Automatic controls are available for this kitchen.

Refrigerators and Freezers

More efficient insulating materials and smaller power packages have increased capacities of refrigerators without adding to over-all dimensions. Freezer compartments are now standard. It is sound practice to provide as large a refrigerator as space and costs will permit. Freezers for kitchen installation may be obtained in either upright or counter-top styles.

Counters and Tops

Materials for counters and cabinet tops are of a great variety. Laminated plastic, linoleum, stainless steel or melon-metal, and tile all have their particular appeal. Good fit and careful installation are necessary to secure counter tops that will not leak, pull away from walls or cabinets, or separate at joints. Poor workmanship will show like the proverbial sore thumb, and soon reflect on the reputation of the builder.

Fans and Ventilators

Many different fans and ventilator units are made for through-the-wall installation over the range. Where the range is located on an outside wall, the solution is easy. Ranges against interior walls may be ventilated by exhaust fans having ducts concealed in a sofit or in the ceiling between joists. If the ventilating unit exhausts through a duct, it is desirable to include a cleanable or replaceable filter to prevent the duct from becoming grease laden, creating a fire hazard.

Various specialized units are available. Some are made for glass-block installation. One unit, installed in the ceiling and attic, serves to ventilate both at the same time with one blower. Another, installed in a hood over the range, draws both cooking odors from the range and hot air off the ceiling, keeping kitchen temperatures down. A unit which may be mounted close to the top of the range permits the installation of cabinets above, otherwise impractical because of the heat from cooking.

This 8 cubic-foot home freezer has storage baskets mounted on slide rails. Lid is counterbalanced for easy handling. Automatic alarm sounds when temperature is above control point.
Let American Kitchens prove the top quality construction of the houses you sell—let the quality features of American Kitchens reveal the quality features of the whole house! For customers look for quality in things they know. And they know that American Kitchens are not only beautifully designed—but exceedingly well built.

When you show them, feature by feature, how American Kitchens by its very construction must use superior steel—how it uses the finest insulation materials, the most expensive door hinges and nylon drawer slides—how it is designed by a famous designer to make working easier—then, at the same time you are proving that yours is a house that gives attention to superior materials and workmanship.

It pays to feature American Kitchens. And you will discover that they are more economical besides, because they give you more sales return per dollar, sell houses faster than any other brand.
"Sold 125 G-E houses—each with
G-E Kitchen-Laundry!"

Here's Mr. Arthur Oman of Weymouth Heights, Mass. who
sold 125 houses within 10 days. He says: "I'm sold on the G-E
Kitchen-Laundry in new homes just as Mrs. Duffy is!" Mrs.
Duffy (also above) says: "All my friends wish they had a G-E
Kitchen-Laundry for just that extra $3.50 a month!"

His General Electric equipped projects
won an N.A.H.B. award!

Mr. Herbert Tandy (above) and his associates, Messrs.
Norman Tandy and Alan D. Allen, are builders of the Saddle-
Wood Hills Development in Hillsdale, New Jersey. N.A.H.B.
stated: "The projects presented were a great credit; sound
planning, ingenuity, and market-appeal were all in evidence."

Again in 1952, successful builders will

pre-sell houses by featuring

the G-E Kitchen-Laundry!

Your houses will sell much faster when women
see all the wonderful, timesaving equipment
and learn that it adds as little as $3.50 a month
extra to regular monthly mortgage payments!

Here you see photographs of six successful builders from
various sections of the country calling back on women
who purchased houses from them months previously.

"Call-backs" convinced these builders—more than
ever—that it pays to feature the G-E Kitchen-Laundry
in the houses they build.

Isn't it time you, too, took a good look at these facts?
We sincerely believe that if you do something about
them, you will sell your houses faster.

1. You know that most women want—and expect—
convenient, timesaving kitchen and laundry appliances
in their new homes.

2. When these appliances bear the General Electric
nameplate, prospects become more quickly sold on the
house because they're well-acquainted with General
Electric products. They know they are the very finest
appliances available. They associate the quality of the
appliances with the entire construction of your houses.

3. Even families with $50-a-week income are enjoying
the comfort of a G-E equipped Kitchen-Laundry! That's
because . . .

4. The buyer pays as little as $3.50 a month more on
his regular monthly mortgage payments.

Whether you sell 10 or 1000 houses . . .

. . . you can sell them faster if they're equipped with
matched General Electric Appliances.

Why not start selling your houses faster, just as the
builders on these pages are?

See your local G-E distributor, or write to the Home
Bureau, General Electric Co., Louisville 2, Kentucky.
"G-E equipment gives us a distinct advantage over competition!"

Here's Mr. Clarence M. Lemon, builder of Wichita, Kansas homes who says: "We sold our entire project of 49 houses the very first day. We included the General Electric Kitchen-Laundry because we felt it gave our homes a distinct advantage over others selling in about the same price range."

"Sold 100 G-E houses—mostly to people with $50 to $70 incomes!"

Here's Carl B. Anderson of Virginia, Minn, who sold 100 houses with G-E Kitchen-Laundry during the past three years. He says: "It was the kitchen-planning service offered by the local G-E distributor that first interested me in including the G-E Kitchen-Laundry in my houses."

"It's the clincher that helped us close 156 contracts!"

Mr. Edwin L. Abbott of Lyons, Illinois says: "The complete G-E Kitchen-Laundry in our 'House of Charm' homes was the clincher that helped us close 156 contracts in one week end. A woman is really sold when she sees General Electric Appliances included as a part of the complete house package."

"57 sold the first day...rest sold themselves!"

Here's Mr. Chas. A. Mohr, president of the Builders Assn. of Maryland. He says: "No matter what the price range may be, women do expect to see General Electric equipment in the kitchen, or else they're not keenly interested. It's no secret: G-E Kitchens sell my houses!"
OVERHEAD FAN set in ceiling near range removes cooking odors, steam, smoke. Also contains concealed spotlight.

COMBINATION SINK AND DISHWASHER UNIT. Dishwashers have either raised top or pull-out front depending upon kitchen layout and space available

VENTILATING HOOD OVER RANGE is a popular feature. Hood is connected to chimney or vent pipe.

(Continued from page 366)

washed installation is contemplated at a later date.

Garbage Disposers

Waste disposal units—electrically-operated grinders, shredders, or pulverizers mounted in the sink drain—are the modern method of handling food wastes. Kitchen odors are minimized. The unsightly outside garbage can, greatest single factor of rat infestation in cities, is eliminated. These advantages, plus added sales appeal, more than outweigh the initial cost of such units.

Table scraps, food wastes, even bones, are all shredded by hardened steel grinders, and flushed down the drain. Modern units are quiet, dependable, and safe in operation. Interlock devices prevent operation unless water for carrying away wastes is flowing. These units may be built-in as a part of new sinks, or may be obtained to mount on any modern sink already in place. Plumbing and electrical connections should be made as the manufacturer directs, and in accordance with local codes.

Local codes should be checked for installation requirements. Some require a minimum of a 2-inch waste pipe. Others will not permit disposal units to be used in conjunction with a grease trap.

The individual incinerator type of disposal unit may be used in locations having plumbing code restrictions. Waste material is placed in a metal container which is fired by gas. The residual ash is removed at periodic intervals, and safe, odor-free operation is assured.

Unit Kitchens

Builders of minimum-space units such as motels and kitchenette apartments have prompted the development of unit kitchens, in which range, oven, sink, and refrigerator are assembled into one or two compact units taking as little as 48 inches of floor space. While such compactness is not advisable for general use, these units will solve problems encountered in creating attic or basement flats, making rooming-house conversions, and the like.

Laundry Equipment

Surveys show that women prefer a first-floor laundry or utility room adjacent to the kitchen, rather than having the laundry part of the kitchen, or in the basement. With numerous compact laundry units available, an efficient laundry can be installed in a small space. Arrangement should follow the work sequence.

(Continued on page 372)
is the word for

TRACY Kitchen Distributors are established, respected and capable concerns. Their most important characteristic, measured by TRACY standards, is the quality of keen alertness to the interests of their dealer customers.

Thorough-going experience in the kitchen business, and an open attitude toward progress and development, fit perfectly with the TRACY policy of volume-building with a top quality line of products.

TRACY Distributors, strategically located, responsible, service-minded, offer the best possible cooperation to retailers interested in kitchen profits. And we'll be glad to put any interested dealer in touch with HIS TRACY Distributor.

* is the word for

Smart-TRACY KITCHENS

Major Stores Program

Since this unusual program was released, some months ago, big-name and big-volume stores have been going to town for extra profitable kitchen volume. Tremendous promotional power—values that mark the participating stores as true leaders in sharp, effective merchandising. Complete details available through TRACY Distributors, whose names are furnished gladly on request.

THE QUALITY-VOLUME LINE

TRACY KITCHENS

TRACY MANUFACTURING CO., Division of Edgewater Steel Co., Pittsburgh 33, Pa.
TYPICAL AUTOMATIC HOME WASHER

- compact, portable unit which automatically fills itself with water, washes, rinses, spin-dries, drains, cleans itself and shuts off

(Continued from page 370)

sequence—washer, dryer, ironer. If space permits, counters should be provided for sorting and piling work. A ventilated receptacle for dirty clothes is desirable. Cabinets for soaps may be a part of mop-and-broom storage facilities.

Washers

The automatic laundry machine is the basic unit. Generally speaking, the automatic washer does not take any more hot water than other laundering methods. Correct water temperature for operation is essential, however, and water heaters should be adequate for laundry requirements.

Plumbing should be roughed in to provide water and drainage lines for automatic washing units. Codes should be checked to determine requirements; some codes will not permit direct connection to waste lines, but require discharge of waste water through a floor drain, or other separately trapped discharge.

The non-automatic type of washing machine is still in regular use in countless families. If this type of machine is to be installed in the home, a double-compartment laundry tray will be needed, whereas single tub trays are adequate for occasional hand laundering jobs where the machine is of the automatic type.

For plumbing economy, the automatic washer is located adjacent to either the kitchen or bathroom, or in the basement below one of these rooms.

Dryers

While dryers of the large capacity type have been in use in commercial laundries for years, the small, cabinet-type of forced air dryer for the home is a recent development. Heat is either gas or electric, and a fan forces a current of warm air through the clothes in a revolving drum. Dryer cabinets are matched to washers by manufacturers, and are suitable in appearance for kitchen installation if desired.

Electrical and gas connections should be provided as required. All dryers made by reputable manufacturers have proper safety provisions and normally present no hazards.

Ironers

The addition of an ironer to the automatic washer and dryer rounds out the full complement of laundry equipment for the modern housewife. Ironers may be of the rotary or flat press type, and while the ironer may be included as a part of the laundry package in the sale of the house, the buyer's choice should be the only factor considered.

Electric ironers are thermostatically controlled for even heating, and should in addition include a heat adjustment for different fabrics. Small units are made to fold up and slide in or out of a cabinet, while larger models have a cabinet-type lid which uncovers to provide shelf space for receiving of finished work.
EASY TO INSTALL!
APPEALING TO TENANTS!
PORCELAIN FOR PERMANENCE!

39 to 69 inches wide

Complete kitchen facilities ... range (gas or electric), refrigerator, sink and storage space ... streamlined into compact units 30 to 69 inches wide.

Proven products of an organization with over a quarter century record of proven success in specialized production of compact kitchens.

Vitreous porcelain fronts never require repainting ... brilliant, white porcelain that stays forever clean with soap and water.

Negligible maintenance costs proven in a quarter-century record of Dwyer Kitchens ... largely in the hard usage of rental properties. Electrical and mechanical equipment of finest quality ... every detail accessible for service from the front without disturbing the assembly.

If you seek tenant appeal, freedom from maintenance problems and low operating costs ... investigate Dwyer Kitchens.

Manufactured by
Dwyer Products Corporation
Dept. AB 5, Michigan City, Indiana
CROSLEY GIVES YOU THE
The Best New Convenience Features...

LIMITED SPACE is no problem when you choose Crosley. Special models are available—designed to occupy a minimum of space, yet offering many of the big Crosley features that housewives want.

MODEL UD-7. You have several compact Shelvador® Refrigerators to choose from with widths as narrow as 24½ inches. Each has many Crosley selling features. In addition, you have a wide selection of compact Crosley Electric Ranges, Shelvador® Freezers, Wall and Base Cabinets, Sinks, Food Waste Disposers, Electric Water Heaters, and other beautifully styled kitchen products.

• Complete Crosley Kitchens can be selected to fit the size and shape of floor plans you lay out. Beautifully styled Crosley products are precision-engineered to fit perfectly, to harmonize with each other. Easy installation features simplify your planning—compact design conserves floor space.
BEST THINGS FIRST...
the Best New Installation Features

DE LUXE
KITCHENS
with a custom look can be designed from the standard Crosley Units. The corner pantry, silent server and range and refrigerator pantries lend individuality to any kitchen! Here's an example of what can be done when your plans call for a full range of fine kitchen facilities.

MODEL T-CAD-12. The latest Crosley convenience features make this Shelvador Refrigerator the center of attraction in any kitchen. It's so good that it's America's most copied refrigerator. Automatic Defrosting . . . shelves IN, not on, the door . . . ButterSafe automatically keeps butter spreadable...matchless"soft-glo"Interior Styling.

For further information, write us for the name of your nearest Crosley distributor:

CROSLEY DIVISION
1329 Arlington Street, Cincinnati 25, Ohio

CROSLEY... Better Products for Happier Living
Working Dimensions for Sink and Dishwasher Installations

Buyers today are seeking homes that feature kitchens that are complete in all details, including mechanical equipment and appliances. Builders, likewise, are taking note of the trend, and it is predicted that the day is not too far off when appliances such as automatic dishwashers and garbage disposer units will be recognized as standard equipment for modern living.

Manufacturers have standardized the height of appliance counter work as 36 inches above the floor. This was adopted as the height most convenient for the average housewife. Sinks, dishwashers and base cabinets are designed to be placed under a continuous counter top for a custom installation, or can be located side by side with matching tops. However, the majority of consumers buy appliances individually, and the height of the backsplasher on the dishwasher-sink will affect installation beneath a window.

One manufacturer recently introduced its latest combination sink model with a six-inch high backsplasher, paralleling the trend in higher backsplashers on electric ranges. This new model has a single control faucet located on the backsplasher, as well as storage compartments for soap, brushes and other articles used at the sink. They assert that this arrangement gives uninterrupted work surface on the sink top and simplifies cleaning. While automatic dishwashers are in use in less than two per cent of the nation's wired homes, yet it has been tagged by manufacturers as an appliance with an excellent potential market.

The majority of manufacturers of dishwasher-sinks have followed the practice of mounting the faucets on the deck of sink and provide for a four-inch high backsplash. This method conforms to the present trend in backsplashes used in conjunction with manufactured kitchen cabinets and counters.

Kitchen Equipment Specifications

Description of the numbered parts are as follows: 1—Vacuum breaker cover. 2—Vacuum breaker assembly. 3—Hot water line. 4—Cold water line. 5—Flow interlock switch. 6—Clamping ring. 7—Supporting ring. 8—Mounting gasket. 9—Mounting stud, rubber washer. 10—Flow interlock, strainer. 11—Connection to flow interlock switch. 12—FA3R Disposall. 13—Disposall power supply. 14—Tailpiece assembly. 15—Hot water line to dishwasher. 16—1-1/2 inch "P" trap minimum. 17—Hand valve. 18—Solenoid operated water inlet valve and strainer. Note: Standard equipment with dishwashers. All pipe and fittings to be purchased locally. 19—Water inlet to dishwasher. 20—Ground wire to motor. 21—Water inlet plug. 22—Heater plug. 23—Motor plug. 24—Soil pipe clevis. 25—Vent. 26—Water inlet to dishwasher. 27—40 inches from floor to underside of window stool. 28—Electric outlet box for Disposall and dishwasher—Maximum load 1500W. 29—Impeller. 30—Drain opening. 31—Pump drain hose. 32—Dispenser cup release cable. 33—Main switch and cover lock cable. 34—1/4 HP, 1725 r.p.m., 115 volts A.C., 5 cycle, 8.9 AMP. motor. 35—Control. 36—Power supply terminal block (use BX cable). 37—Not more than 15 feet long, 2 inch minimum pipe size, slope 4 inches per foot minimum.
OUTLINE drawing of front and side view of Hotpoint sink and dishwasher, indicating detailed and over-all dimensions of unit including backsplasher, to assure proper installation in kitchen.

ROUGHING-IN dimensions for installation of Hotpoint sink, dishwasher and Disposal shown at left. H & C—1½ inch sink hot and cold water line openings. D—1½ inch sink drain line opening. E—Standard electrical connection box. H—Dishwasher hot water line opening; must be reduced to ¾ inch before entering dishwasher. D—1½ inch dishwasher drain line opening.

PARTIAL drawings showing dimensions of through-the-floor or wall roughing-in connections for dishwasher, sink, and disposer. All dimensions are taken to the center line. Pipe sizes: trap and drain, 1½ inch I.D.; "hot" line ½ inch I.D. Plumbing and electrical connections must conform to local codes. Run a separate circuit with separate fuse box and 20-ampere fuses to junction box provided in cabinet. Use only on 60-cycle 115-volt alternating current.

Mr. Architect—Mr. Builder
...for the new trend in kitchens!

The Built-In Electric Range
You Can Put in Any Kitchen!

Costs NO MORE than an ordinary range!

More and more home-buyers and home-builders today are demanding the advantages of built-in cooking units. Presteline meets this demand with a new built-in electric range that offers every luxury feature at a moderate price. Low in initial cost, Presteline ranges are also easy and inexpensive to install, skillfully designed to fit standard cabinetry...so compact and space-saving that surface cooking elements can be installed even on a 15" counter with only 4" depth clearance required. Presteline Built-in Units offer new ease and flexibility in kitchen planning. They create new kitchen beauty through exclusive decorator colors and new non-tarnish metal finishes.

Here's what makes Presteline DIFFERENT

Eye level
AUTOMATIC OVENS
Largest on the market. Fits standard 24" cabinets.

AUTOMATIC OVENS

Fastest Pre-heat
3-Position Oven Rack
Automatic Oven Control
"Minute Minder" Signal Bell
Fire-proof Asbestos Construction
Non-tarnish Anodized Aluminum and Hard-baked Lifetime Porcelain Finishes
Choice of Top Arrangement including SAFETY TOP
Remote Control Switch (Optional)

Individualized
COOKING TOPS
Fit standard cabinet units 15" and larger. Various arrangements to fit any kitchen plan.

Take the TIME—See...
Cool, Odorless Kitchens Catch the Buyer’s Eye

In these days of air conditioning, a well-ventilated kitchen in a new house is a definite selling advantage. Today’s housewife responds to the suggestion that she need not have cooking odors carried all over the house, and that kitchen ventilation saves cleaning effort and frequent redecorating.

For this reason, many builders are installing built-in ventilating fans in the kitchens of their new units. There are definite rules governing these installations, however. The mere presence of a ventilating fan in the kitchen does not mean that it will do an adequate job of changing the air and removing objectionable odors and grime.

The best location for the kitchen ventilating fan is directly over the range. This is the point at which cooking odors, steam, grease globules and so on are emitted. If carried away from as close to their point of origin as possible, the ventilation will be the most satisfactory. If the range is against an outside wall, it is relatively easy to build in a fan above it, discharging the air directly to the outside.

If the range cannot be against an outside wall, it should be close to one so that the fan can be mounted only a short distance from it. Often, a soffit above the range can be used as a conduit to the outside wall, the fan being installed in the soffit just over the range.

It is preferable not to install cabinets over range because their interiors become too hot. There are some types of kitchen ventilators, however, that can be concealed in cabinets, the lower part of the cabinet acting as a hood which catches virtually all fumes. Fans mounted through the walls have adjustable sleeves to accommodate various wall thicknesses. Suggested sizes are an 8-inch fan for small kitchens, 10-inch for medium size, and 12-inch for very large kitchens.

**Hot Water Supply Must be Adequate**

Builders are changing their ideas of hot water installation capacities. The increasing use of automatic dishwashers, automatic laundries, and the more frequent bathing made convenient by multiple baths, has changed previous conceptions about the size of storage tank and heating capacities necessary for today’s new homes.

A 20-gallon storage unit no longer is recommended, even for a small house, because it is imprudent to separate the automatic laundry. The house cannot have adequate hot water supply while the washing is being done. These smaller capacity units now usually are used only where there are two heaters instead of one—a practice growing among builders of the rambling, ranch style dwelling where long pipe runs are necessary if only a single heater is used.

There is a rough formula for determining the size water heater needed in a home. Tank size, plus rate of recovery, equals peak demand. One variable in this equation is the “peak demand.” How can it be determined?

The automatic laundry requires from 30 to 40 gallons of hot water per hour. An automatic dishwasher will use about 10 gallons per load. A tub bath requires from 15 to 20 gallons. A shower takes from 10 to 15 gallons.

Non-automatic washing uses from 12 to 16 gallons of hot water per wash, and an additional 6 to 8 gallons if warm water is used for rinsing, as it usually is. Manual dishwashing takes about 3 gallons for an average family, or you can figure a gallon per person. Rinsing dishes under the hot water faucet will take another 6 gallons.

Recovery rate can be determined roughly by taking the B.T.U. input of the heater and dividing by 1,000. Thus, a heater with input of 25,000 B.T.U.’s will have a recovery rate of 25 gallons per hour. In winter, when incoming water may be colder, a higher degree rise in temperature is, of course, necessary.

In general, rough guides to the size water heater needed are: for houses with one bath and one or two bedrooms, a 30-gallon capacity; one bath and three or four bedrooms, or two baths and one or two bedrooms, 40 gallons capacity; two baths and four or five bedrooms, or three baths and three bedrooms, a 50 gallon capacity.

**ECONOMICAL ACHIEVEMENT** of beauty combined with efficiency in a modern kitchen is essential. It is essential because national publicity and advertising in consumer publications have educated housewives on the basic principles of the compact, scientifically-planned women’s work centers now available.
Finnman-Dillon Company, Omaha, Nebraska
General Contractors
R. E. Finnman
Designer
J. L. Brandeis Company
Interior Decorators and Furnishers

THE Omaha Hotpoint House of the 50's is the latest in a series of electrified houses being erected in strategic cities throughout the country to demonstrate how builders and manufacturers of home equipment can team up in a practical promotion to reach prospective home buyers.

Thousands of visitors inspected the home during "open-house." A completely coordinated advertising program, which received excellent cooperation from the newspaper, radio and television stations, and civic interests, gave the house maximum exposure. And, of course, Finnman-Dillon Company, the builders, came in for a full share of this favorable publicity.

The most modern of electrical appliances and equipment is incorporated in this Hotpoint House to make living easier and more pleasant. Approximately 30 Omaha supply outlets, many of them handling nationally advertised equipment, tied in with this highly successful promotion.

The national activity is being sponsored by Hotpoint Inc., and activated locally by distributors, builders, the utility company, and suppliers. More and more Hotpoint Houses of the 50's will be built across the nation. Their object is to set the pace for better living in the communities in which they are built, and to influence the public to buy or to build better homes completely equipped and completely electrified. For more information concerning a Hotpoint House of the 50's in your city, write the Builders Division, Hotpoint Inc., 5600 West Taylor Street, Chicago 44, Illinois.
Compare all 3 - and you'll buy AMERICAN BUILDER

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<td>89,904</td>
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<td>72,322</td>
<td>68,445</td>
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Foreign Paid Circulation: AMERICAN BUILDER 310; PRACTICAL BUILDER 56; MAGAZINE OF BUILDING 7,629

Continued proof of A. R. F. Readership Study that AMERICAN
in the Light Construction Field!

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JUNE 30, 1951

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Leader in Redwood—Since 1869
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Member of California Redwood Association
LUMBER is graded according to established grading rules and each piece usually carries a grade mark designating the species and the grade quality. These standardized and recognized grading practices make it possible for the lumber buyer to specify grade desired and be assured of uniformity in his lumber purchases.

No definite degree of hardness divides the hardwoods and softwoods. Many hardwoods are actually softer than the average softwood because the division reference is based upon a botanical classification. The general botanical classification designates that hardwoods come from broad-leaved trees, which shed their foliage annually, while softwoods come from needle bearers, which retain their foliage for more than a year. Practically all construction lumber is softwood.

Establishing Standards

The fact that no two trees are identical necessitates the grading of each piece of lumber that comes from each log. Specific grade and size standards have long been established by the American Lumber Standards, formulated after consultation between officials of the U. S. Department of Commerce and representatives of lumber manufacturers, distributors, wholesalers, retailers, engineers, architects and builders.

Softwood lumber is divided into three main groups on the basis of the uses to which it is to be put. These groups are (1) yard lumber; (2) factory, shop and box lumber; and (3) structural timbers. Yard lumber is less than five inches in thickness and is intended for general purpose building. Factory or shop lumber is selected for further manufacture. Structural timbers are five inches or more in thickness and width. General grading classification table is shown on page 284.

Select and Common

Ordinary construction lumber is graded on the basis of quality into two main classes—select lumber and common lumber. Select lumber has but very few minor objectionable characteristics, is smoothly finished and can be used as a whole for finishing purposes or where large, clear pieces are required. The selects are divided into two main groups: A and B grades, suitable for natural finishing, and C and D grades, which have blemishes somewhat greater than those in the first class, but blemishes which can be covered with paint.

Common lumber may contain numerous characteristics which do not permit its use for finishing purposes but which still permit its use for general utility and construction purposes. The two principle classifications here are boards and dimension. Boards are graded as No. 1, No. 2, No. 3, No. 4 or No. 5. These grades are not equivalent in all species. Dimension is graded as No. 1, No. 2 or No. 3. The characteristics of these various grades are described briefly in the table on yard lumber.

Size Standard

Lumber sizes are based on its rough, green dimensions. For example, although described as 4 inch by 4 inch, which is the "nominal" size,
### General Classification of Softwood Lumber

<table>
<thead>
<tr>
<th>Grade</th>
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<tr>
<td>A</td>
<td>Best quality, free of defects</td>
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<td>Allowable small defects or blemishes</td>
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<td>C</td>
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<td>D</td>
<td>Allowable large number of defects or blemishes</td>
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<td>E</td>
<td>Acceptable for specified uses</td>
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### The Above Classification of Softwood Lumber

- **Yard lumber**
  - less than 3 inches thick, intended for general building purposes, grading based on use of entire piece

- **Finish lumber**
  - less than 3 inches thick and 12 inches and under in width
  - boards less than 2 inches thick and 8 inches or over in width

- **Flanks**
  - 2 inches and under 4 inches thick and 8 inches and over wide

- **Dimension**
  - 2 inches thick and under 8 inches wide

- **Sawing**
  - 2 inches thick and under 8 inches wide

- **Heavy joints**
  - 4 inches thick and 8 inches or over wide

- **Joint and plank**
  - 2 inches thick and 4 inches and over wide

- **Beams and stringers**
  - 5 inches and over thick and 8 inches and over wide

- **Posts and timbers**
  - 6 inches by 6 inches and larger

- **Factory plank grade**
  - for door, sash, and other cuttings 1 inch to 4 inches thick and 5 inches and over wide

- **Shop lumber grade**
  - for general cut up purposes

### Grades

- **A Select**
- **B Select**
- **C Select**
- **D Select**
- **No. 1 boards**
- **No. 2 boards**
- **No. 3 boards**
- **No. 4 boards**
- **No. 5 boards**

### The Modern Braced Frame

- **Stiffness** is most important factor to a well built house. On these pages are shown detail drawings for joists, bridging, subflooring, studs, openings, framing around chimneys, sheathing, roof framing, trussed rafters, fire-stops and partitions.

### Good Framing Practices

The use of good framing practices cannot be over emphasized. Enough supporting members of proper size must be used, not only to support ordinary loads but to impart sufficient strength to the entire structure. Good framing practices are necessary to give floors and entire structure good stiffness; a most important factor to a well built house. On these pages are shown detail drawings for joists, bridging, subflooring, studs, openings, framing around chimneys, sheathing, roof framing, trussed rafters, fire-stops and partitions.

### Stairway Framing

Stair layout and building is a phase of construction confined largely to millwork manufacturing firms who employ professionals to help builders with these problems.

- **Never underestimate the value of**

### American Builder

- **THE MODERN BRACED FRAME is in every way adaptable to modern needs, but it must not be slighted during assembly**
good framing around stair openings. Doubled and sometimes tripled joists with well-selected, properly fitted and adequately fastened headers are of utmost importance to achieve strength and rigidity. Firmly secure stair horses against header of stair opening. In no case hang them from it.

It is recommended that risers be 6¾ to 7 inches and treads be 10¾ to 10⅞ inches. Slight variations in these dimensions may be made, but in all cases have tread and riser measurements total about 17½ inches. Between 30 and 36 degrees is the proper, safe, over-all stair flight angle. The recommended height for permanent handrails is 36 inches above the treads. Minimum headroom distance between nose of treads and soffit over stairway, in a line parallel with the horses, should be 6 feet, 8 inches for

(Continued on page 392)

A masonry chimney, regardless of its location, must be self-supporting and independent of the house framing.
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WHERE EXTRA LOADS ARE PLACED ON JOISTS (left above) double headers and trimmers must be accurately fitted and nailed in place. When framing for a second-story overhang (right above) a 2 x 4 ledger should be securely nailed to the double joist to receive notches in cantilevered joists used to support the overhang. Where overhang is at the end of joists, they extend beyond the wall the required distance.

CAP AND TIE PLATES should be used for all exterior walls and the corners lapped and nailed with three 16 penny nails.

Lumber, Millwork and Related Products continues on pages 389—92—93—94—95—96—97

ACCURATELY FITTED DOOR AND WINDOW FRAMING is an indication of careful building for permanent stability. Where wide openings occur in the framing, extreme care should be taken in header construction because so much of the load above must be carried on these members. The illustration above at right shows one good method. Note that the diagonal members are carefully fitted and placed for rigidity.

CUT-IN OR LET-IN BRACING around openings or at corners should be as close to a 45-degree angle as possible. Adequate corner bracing or diagonal sheathing are prerequisites of good construction and are stressed by meticulous builders.
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QUALITY SINCE 1895

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Simson Fir Doors, manufactured from mature Douglas Fir, are available in all areas in all FDI grades, all specifications and all designs including the Simson Flush Door. The increasingly popular Simson Western Hemlock Door is manufactured in all FDI patterns.

DOUGLAS FIR AND HEMLOCK LUMBER
From our forests and mills all grades and sizes of old-growth green Douglas Fir and Western Hemlock lumber is available, especially to the water-borne markets on the Atlantic and Gulf coasts.

REDWOOD LUMBER
Dry finished redwood lumber is cut and manufactured in all standard patterns for national distribution. Green redwood lumber is available for limited distribution.

ACOUSTICAL PRODUCTS
Simson Acoustic Tile is available through authorized acoustical contractors and Simson Noisemaster Acoustical Tile through regular distributors and dealers. These fine acoustical products are preferred because of high sound absorption and exclusive Hollokore drilled perforations.

INSULATING BOARD PRODUCTS
For maximum utilization of our timber resources, we convert small, sound wood pieces from our mills into Insulating Board Products including Interior Finish Board, Plank and Tiledboard, Sheathing and Lath, Roof and Cold Storage Insulation and Acoustical Tile.

ANOTHER manifestation of Simson Logging Company’s continuous growth and progress is the completion of a modern new drying, storage and processing plant for redwood lumber at Arcata, California. Here, redwood from Simson’s timber holdings and sawmill at Klamath, California, is prepared for shipment.

This expansion is part of a steady growth which started in 1895, the year the company was founded. Simson’s logging, milling and manufacturing activities contribute to the stability of a large segment of the Pacific Northwest and Northern California which depend upon forest products for survival.

By means of good forest management, maximum utilization of timber resources and continuous reforestation, we can assure our customers of deliveries of forest products, manufactured to meet modern requirements, for many years to come.

SIMPSON LOGGING COMPANY
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388 AMERICAN BUILDER
TO FIND THE RAFTER LENGTH when its run and pitch are known, follow the vertical line from the run to its intersection with the radial line of the pitch. From the intersection follow the curved line to the length. The diagram also may be used to determine the run when the length and pitch are known, or to determine the pitch when the length and run are known. Example: For a run of 20 feet and a pitch of 10 in 12, the length of the rafter is read directly from the diagram as 26 feet.

THE LENGTH OF JACK RAFTERS, regardless of their spacing, can also be determined by using the steel square. Hold the square to the stock with 12 inches, the unit of run, on the blade and the rise per foot on the tongue, as shown in the drawing. Mark along the line A-B. Then slide the square on the stock until the figure representing the spacing of the jack rafter touches the point B. The distance D to B will be the difference in length of the jack rafters.

"PITCH" is the amount of slope of a roof. "Rise" is the vertical distance the ridge is above the plate. The unit of measurement is one foot or 12 inches. To find the pitch, divide the rise by the span of the building. Rafter run is one-half the width of the building. The drawing above shows a number of rafter pitches in relation to the steel square.

FEATURE CRA REDWOOD

You’re bound to make friends where you sell CRA Redwood—the grade-marked, trade-marked, Certified Dry Redwood from California’s coastal counties. For this is Redwood at its best—uniform in quality—dependable in performance—ideal for any job that calls for Redwood’s durability, stability and paintability. That’s why you should feature grade-marked, trade-marked CRA Certified Dry Redwood—the Redwood you can be sure of—the Redwood processed by the reputable member firms of the

CALIFORNIA REDWOOD ASSOCIATION
576 Sacramento St., San Francisco 11

Hammont Lumber Co. • Holmes Eureka Lumber Co. • Northern Redwood Lumber Co. • The Pacific Lumber Co. • Rockport Redwood Co. • Simpson Logging Co. • Union Lumber Co. • Willits Redwood Products Co. • Arcata Redwood Co. • Coastal Plywood & Timber Co.
If you build for 

Modern Farm Buildings
That Save Chores Hours...Increase Farm Income
From the Weyerhaeuser 4-Square Farm Building Service

Regular Promotion Program
During the year, four sets of promotion material will be issued to help you sell more farm buildings.
the farm market...

Your Weyerhaeuser
4-Square Lumber Dealer

CAN HELP YOU OBTAIN MORE BUSINESS

Weyerhaeuser is helping to develop more profitable business in the farm market with a powerful selling program ... and if you build for that market you will want to talk to your dealer about it.

This selling program is built around the 4-Square Farm Building Service which contains designs, blueprints, and material lists for 16 modern farm homes ... and 171 service buildings and equipment items. It is available for your use, without charge, at the office of your 4-Square Lumber Dealer.

As a part of this program, Weyerhaeuser is running a series of page dominating advertisements in your state farm papers. This advertising is designed to create active interest in modern homes and efficient farm buildings.

The second part of this program is a strong merchandising promotion designed for local dealer use ... and there's material in it for your use also ... plan books and folders on homes ... buildings ... and equipment. Material that enables you to show your farm customers the newest and best in modern shelters.

Your 4-Square Dealer can supply you with quality lumber products ... efficiently manufactured, properly seasoned, carefully graded, accurately cut ... and trademarked "Weyerhaeuser 4-Square". Dependable lumber is an important factor in fast, profitable construction.

See your Weyerhaeuser 4-Square Lumber Dealer soon. Go over this program with him. It means more profitable farm business for you ... month after month.

WEYERHAEUSER SALES COMPANY
ST. PAUL 1, MINNESOTA

Farm Building Service

APRIL 1953 391
Rise in Inches Hip or alley per Foot of Run

<table>
<thead>
<tr>
<th>Rise in Inches</th>
<th>Equivalent Pitch</th>
<th>Common Rafter</th>
<th>Hip or Valley Rafter</th>
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<tbody>
<tr>
<td>1°</td>
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<td>.719</td>
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<tr>
<td>4°</td>
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TO FIND THE LENGTH OF A RAFTER for any roof pitch, multiply the span by the factor in the same horizontal line as the column marked "Common Rafter" or "Hip or Valley Rafter," as the case may be. The lengths obtained by this table do not include a projection over the plates. If rafters are to be continued over the plate, add twice the horizontal cornice projection to the span before multiplying by the factor above. If the rise per foot of run contains a fractional part of an inch, use the next larger number of inches.

ALLOWABLE SPANS FOR YELLOW PINE AND DOUGLAS FIR RAFTERS

(First table below is for Yellow Pine and the second is for Douglas Fir)

<table>
<thead>
<tr>
<th>Roof slopes greater than 3 in 12. Rafter = the actual length of the rafter between the plate and the ridge or an intermediate support</th>
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<table>
<thead>
<tr>
<th>Nominal size (inches)</th>
<th>Spacing c to c</th>
<th>1000-f Select Structural Framing, etc</th>
<th>No. 1 Framing, Joists, Plank, etc</th>
<th>No. 2 Framing, Joists, Plank, etc</th>
<th>No. 3 Framing, Joists, Plank, etc</th>
<th>Heavy roofing</th>
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ALLOWABLE SPANS FOR YELLOW PINE AND DOUGLAS FIR RAFTERS

(IN ALL TYPES OF BUILDINGS, including farm buildings, it is essential that the foundation be extended below possible frost penetration, even though firm bearing soil is found at a shallow depth. This will prevent upheaving by freezing temperatures.

STAIRWAYS SHOULD BE FRAMED with not less than three horses and of stock wide enough to leave 3½ inches of material behind each cut. Landing must be carefully supported and the stair braced against thrust. Accurately cut horses or stringers are important.

(Continued from page 385)
INTERIOR POSTS IN FARM STRUCTURES will, under certain conditions, move laterally or sideways. An iron pin or dowel embedded in the post footing and running into the post itself will prevent any possibility of movement to put building off plumb.

The outside pushing in or from the inside pushing out. Earth or manure is often piled against a wall in a spot where such pressure can cause a failure. A shallow footing can fail because of excessive moisture or be weakened by consistent stamping and tramping of animals.

Every permanent farm structure must be anchored solidly to its foundation. Barns do not blow down—they blow up. They are lifted off foundations, or roofs and sides blow off and out. The most common reasons for barn failures are: (1) the nature of wind pressures; (2) the method used in making joints; (3) improperly laid masonry block foundations which fail; (4) failures at points of anchorage. Drawings on these pages show some recommended anchoring methods.

Gambrel roof failures occur primarily at sill, plate and ridge—wherever toenailing is usually used. It is safer to lap members past one another and put nails, bolts or fastenings in shear. The ridge point can be further reinforced by a light strap iron over the rafter junction.

Good Joints

Good joints are so important in farm buildings that every builder should know the relative merits and strength of the principal methods of making wood joints. See diagrams on these pages which show the relative strength of joining methods. Further information regarding Correct Frame Nailing will be found elsewhere in this issue.

TIEING ALL FRAMING MEMBERS TOGETHER securely is essential in farm structures. Where a load-bearing post supports a girder on which either joists or rafters rest, an angle iron or similar device should be used to tie the post, girder and members.

SOME SUGGESTIONS for improving stud and joist framing are shown at the left. To eliminate toenailing at the common points of failure at sill, plate and ridge, it is always wise to lap members past one another and put nails, bolts or fastenings in shear. The ridge joint may be further reinforced by a light strap iron over the rafter junction, shown in Section E above.

DOUGLAS FIR

This strong, tough, straight-grained softwood is a first choice for any lumber use where unusual strength, stiffness, load-bearing capacity and nail-holding power are important. Popular, too, for paneling and interior trim and cabinetwork.

One of ten fine softwoods from member mills of the Western Pine Association. All are manufactured, seasoned and graded to exacting Association standards. Lumber dealers, builders, architects and wood users have found them dependable and best for many construction uses.

THESE ARE THE WESTERN PINES

IDAHO WHITE PINE
PONDEROSA PINE • SUGAR PINE

THESE ARE THE ASSOCIATED WOODS

LARCH • DOUGLAS FIR
WHITE FIR • ENGELMANN SPRUCE
INCENSE CEDAR • RED CEDAR
LODGEPOLE PINE

EXAMPLES OF STOCK MOULDING FROM THE "8000" SERIES OF STANDARDS

Millwork

Millwork consists of building items which are fabricated at the factory by the use of some type of machinery. For specific information on millwork relative to doors, windows and stairs refer to directory section titled windows, doors, frames, and stairs.

Millwork may be either assembled at the factory or delivered to the builder knock-down. Included in the many items referred to as millwork are balustrades, scroll work, bent work, casework, cupboards, mantels, mantel shelves, columns, colonnades and a wide variety of mouldings. While some standardization of size exists, designs may be unique with each manufacturer.

Mouldings, however, can be purchased by reference to a standard numbering system, generally adopted by moulding manufacturers, which indicates the size and design of the specific type of moulding. In addition to this accepted standard system of identification, certain stock mouldings have become standard within certain sections of the country. For example
Methods for Anchoring Frames to Foundations In Farm Buildings

Here, a 4 x 1 1/8-inch strap iron is bent to form an L shape. The foot of the L and part of the leg are imbedded in the concrete at the time the foundation is poured. The upper part of the leg, which has been previously drilled with holes, is fastened securely to the stud with large wood screws or lag screws. The double sill is anchored to the foundation in the usual manner and all the studs are toenailed to the sill. The steel straps must be carefully lined up and properly spaced.

Above, anchor bolts are placed at six-foot intervals in the foundation wall as it is poured. A 12-inch length of 4 x 3-inch strap iron is bent to form an L-shape bracket 4 inches long in one direction and 8 inches in the other. The 4-inch leg is drilled to fit over the anchor bolt and the 8-inch leg is drilled for two 3/8-inch bolts by which it is fastened securely to a stud. Every third stud is held down in this manner and the others are toenailed to the sill in the conventional manner. Existing buildings can be anchored in this manner by using lag screws to fasten the straps to the sill, provided the sill is well anchored to the foundation. In place of the L-shape bracket shown, a T-strap might be screwed to the inside of the studs and sill.

(Continued on page 396)
Headers of the same size as used for the studs can be placed between pairs of studs 8 feet apart along the foundation. Anchor bolts are placed in the foundation 8 feet on centers and anchor the headers as well as the wall securely to the foundation. The studs are toenailed to the sill and spiked to the ends of the header. The header should be separated from the sill by blocks spaced widely enough to prevent splitting the ends of the studs when spiking them to the headers. By using lag screws to fasten the headers to the sill, this method can be used to strengthen buildings already built if the sill is well anchored to the foundation.

Here, 4x1 1/4-inch iron straps are bent in an L-shape to extend across the under-side of the sill and up the side of the stud far enough to permit fastening them to the stud with large wood screws or lag screws. The sill is laid on a bed of cement mortar and secured to the foundation with anchor bolts spaced eight feet apart along the wall. The iron straps are inserted at four-foot intervals when the sill is laid.

Drawings and data courtesy Kansas State College.

Various types of joints discussed in text on page 393. At left are 2x5's fastened with the common nailed joint; next are 2x4's fastened with two 1/2-inch bolts; the third illustrates a timber connected joint with one 2 1/2-inch ring imbedded between two 2x4's. The fourth illustration shows a glued joint with two 2x4's lapped eight inches. This latter joint tested by far the strongest.
FOUR METHODS OF IMPROVING TOENAILED JOINTS

Quiet
Special SPIREX coating insulates against noise and protects balance from rust. SPIREX gives you quiet operation with years and years of trouble-free service!

Smooth
Patented spring construction with separated coils eliminates rasp and friction, makes windows slide smooth-as-you-please for the life of the building.

Adjustable
Tension can be adjusted after balance is installed for perfect lifting power according to sash weight. Requires only 4-5 turns for average sash.

Conventional toenailed joint is on the right, top line. The Timber Engineering Company's Trip-L-Grip anchor, made in six different shapes, is at the right in bottom row.

GREGG Quality Millwork

COLONIAL CORNER CABINETS
KITCHEN UNITS
Base and Wall Cabinets
FIREPLACE MANTELS
COLONIAL DOOR ENTRANCES
DOOR BLINDS WINDOW BLINDS
WOOD LOUVRES
GABLE SASH GABLE LOUVRES
BASEMENT WINDOW UNITS

To top grade materials and superior workmanship, GREGG adds sturdy packaging for easy storage and handling and to assure that every piece reaches the job undamaged, ready for installation.

Send free window unit booklet on Spirex and Caldwell tape balances.

GREGG & SON, INC.
Framingham, Mass.
MILLWORK OF QUALITY SINCE 1719
FOR SPECIFYING RO-WAY GARAGE DOORS
for your Residential, Commercial and Industrial Jobs

Again Ro-Way sets the pace in garage door improvements. Ro-Way engineers believe that along with the great strides made by the Automotive Industry there should also be constant advances in the Doors for buildings that house automobiles, trucks and buses. So in addition to Power-Metered springs, Double-Thick Tread track rollers, Crow's Foot outer bearing supports and many other exclusive Ro-Way developments you are now offered—

1. TAPER-TITE CLOSURE—Vertical tracks taper away from jambs at a pitch of 1/4" per door section; this "taper", or angle, is the foundation of the Ro-Way Taper-Tite Closure.

2. SEAL-A-MATIC HINGES—of graduated height guide the closing door tightly against side and head jambs; these same hinges immediately free the opening door from jambs to provide easy, frictionless operation.

You will find it well worth while to contact your nearby Ro-Way distributor. Look in the yellow pages of your telephone directory or write us.

For time-saving, intelligent, cooperative service on all garage door jobs, you'll find the Ro-Way distributor a good man to know. Remember he is one of a national network of hand picked distributors giving dependable satisfactory sales and installation service.

ROE MANUFACTURING CO., 701 Holton St., Galesburg, Ill.

there's a Ro-Way for every Doorway!
DETACHED GARAGE of this one-story ranch-type house is made a part of the overall arrangement by a connecting breezeway. The garage doors are placed off-center of front wall to provide for workbench on side wall. Roof ridge is centered on door, thus extending the roof line on one side and purposely establishing a lower eave line.

UNDER present conditions of high-cost construction, garages have come in for a certain amount of neglect. Roughly 50 per cent of houses built for sale over the past five years have been built without garage. For low-priced homes built for sale the garage has almost entirely disappeared; and for the medium-priced house the builder will often include a carport, a skeleton shelter which the owner in a cold-weather area can later fill in for more adequate protection.

When a garage is included as part of the job, special care should be taken with its planning. Garages should be thought of not only in terms of car protection and storage, but as utility space where equipment used in maintaining grounds and building may be stored, where extra-storage of all kinds may be accommodated, and as a potential workshop space for the man of the house.

Planning and Design

First of all, space for the car must be at least wide enough to permit car doors to be opened so individual may get in and out comfortably when the car is in the garage. Ten feet is about the minimum width for this. It must be at least 12 feet wide so a person can get around the car with the garage door closed. That means at least six inches in front and about 18 inches clearance in the rear. With the exception of about three of the largest American passenger cars made, 20 feet is adequate for this. The ceiling or deck above the car should be at least seven feet six inches above the floor. These figures approximate the minimum requirements for housing the family car. FHA requirements in many areas specify minimum inside width of 9 feet, 6 inches and length of 19 feet.

Size of the lot and location of the garage determine largely where additional space can be provided in the unit so it can properly fulfill its function as a utility building. If it must be single-car width then the extra space should be added lengthwise. Even though the family may never intend to have two cars, a double-car 20-foot wide unit is desirable where space

A LARGE single garage should be at least 14 or 15 feet wide. This permits doors on both sides of the car to be opened comfortably and still allow about two feet for storage or a work bench along one side. The recommended minimum size for a single garage is 10x20 feet. If it must be kept to this width and if storage space is desired, the extra area can be added to the length of the narrow structure. The recommended minimum size for a double garage is 20x20 feet. With two cars this leaves an inadequate amount of storage space but ample room for the cars.
permits. Variations in providing extra storage and recreational space in garages can take an infinite number of steps in different directions from these two standard setups.

The Urban Land Institute in its "Community Builders Handbook" says: "It is recommended that storage space be provided in garages even where houses contain basements. Provision of storage space in the garage for tools, garden furniture, and similar articles is desirable. For single car garages, it has been found feasible to add five to six feet to the length of the garage for this purpose. This is preferable to widening the garage as this may require a greater lot width."

Home buyers definitely prefer the attached garage with direct access to the street. Garages on the rear of the lot are unpopular because of the great amount of paving required and their interference with the use of yards.

When planning the garage, consider traffic between garage and house, garage and rear yard. Consider the housewife shopper with a load of bundles to carry from car to kitchen. A large door opening directly to the rear or side of the garage is usually preferred. When single garages are built wider than the 10-foot minimum inside but less than two-car width, the 8- or 9-foot entrance door for the car should be placed off-center so that maximum storage or work space is allowed at one side.

In addition to considering size of lot, building codes, climate, street traffic, and parking space for visitors, plan for adequate wiring, good lighting, and suitable ventilation to remove gasoline fumes and other odors from attached garages. There should be provision for running water as well as window area for light over work space.

Construction

No matter how well designed the garage is, it can soon start to fall (Continued on page 902)
The best feature of Barcol OVERdoors is that they can be used in so many different ways. They can be made to fit almost any size opening. You can get special design sections to match decorative ideas. You can get special hardware arrangements to take care of low headroom, high headroom, all-vertical and other situations. Yet you get the same distinctive and outstanding features for all these conditions. You get a cam closing action that insures weather-tight closing without sticking. You get easy working doors, due to anti-friction rollers, tailored twin coil springs, straight-line cable connections. You get long life and low maintenance costs, due to good engineering and quality construction all the way through. You get, in the Barcol OVERdoor — and at reasonable cost — practically all the value you could hope for; and you get it in any size door for any type of building.

Standardize on Barcol OVERdoors — others are doing it, with great satisfaction.
IMPORTANCE of the location of the garage on the home site should never be underestimated. Easy and preferably protected access to the basement or service portions of the house adds immeasurably to the full use of the garage as a utility building. The driveway should always be planned at the same time the garage is planned. Tricky turns, bad grades and obstructed views of danger spots are some of the results of poor driveway planning. A one-car driveway should be at least eight feet wide on straight stretches and 11 feet wide on the curves. Regardless of grade there should always be a level area at least 15 feet long in front of the garage to facilitate parking without the danger of the car moving because brakes are not set or because of tampering.

(Figure of drawing showing garage and driveway)

Framing. The one-story detached garage may be framed with 2 by 4's 24 inches on center. Studs do not have to be doubled around openings less than 3 to 3 1/2 feet in width. Corner posts can be 2 by 4's or 4 by 4's and single top plates can be used but should be lapped or tied at corners. The rafter ties can be 2 by 4's but should be spaced no farther than 6 feet on center. Corners should be braced, and these pieces can be fastened on the inside surface of the studs. Sheathing and building paper can be omitted, although these will help the home-owner avoid much hard starting in cold weather. In extremely cold climates, insulation is desirable. In temperate climates, open carports have proved popular, affording merely a roof and possibly one side wall for protection.

(Continued from page 401)
The New BERRY DOOR

Sets the Standard of the Industry

With the Strongest, Easiest Operating Garage Door Built

Here's why residential contractors—owners, too—want the garage door that’s setting new standards throughout the industry. Only the new Berry Door gives them beauty, the durability of welded steel construction, the easiest operation known and a choice from a complete line of models for all requirements. And all these features mean continued owner satisfaction.

- The strength and light weight of Diagonal Grid Design
- Rugged hardware, oversized bearings—continued easy operation
- Horizontal grooves blending with contemporary home design
- Durable zinc plating, plus bonderizing and a beautiful gray paint job
- Lights with “snap-in” rubber mouldings available for all models
- Half-hour installation of canopy type by one professional
- Latches on both sides—metal seals on both sides, replaceable rubber on bottom
- Prices which reflect the engineering and production methods of the automotive industry and years of garage door experience

The new Berry Door Line includes 8’ x 7’ and 9’ x 7’ canopy and track types and a rigid 16’ x 7’ track type—all available with owner-replaceable rubber mounted lights in two-piece mouldings used by bus and truck manufacturers for years. All hardware is packaged, complete with fastenings. Canopy extends 72”; track type disappears entirely within garage, requires 2 1/2” headroom. Easy-Guide Track eliminates “pin point” hanging. Balance and load requirements easily adjustable by owner. Opening dimensions are standard, exactly 8’ x 7’, 9’ x 7’ and 16’ x 7’, plumb and square, measured inside of trim.

Attach coupon to your letterhead for details and name of dealer in your area.

STEEL DOOR CORPORATION
364 S. Jessie Street
Pontiac, Mich.

Please send details of Berry Door Line

Name ____________________________
Company _________________________
Address __________________________
City __________ Zone __________ State __________
THE first four designs above suggest various types of parking areas and turnarounds that can be incorporated as part of the garage driveway where they are necessary or desirable. Where these large areas are concrete they are also ideal for children’s play or game courts. Dimensions shown are minimum. Where the driveway crosses the street curb, it must be flared at a three to five-foot radius.

(Continued from page 402)

Garage Doors

The garage door is usually the largest single unit of movable equipment built in as part of the housing establishment. It is also one of the largest and most conspicuous features of the average home. Designers and builders who desire to please their clients therefore accord the garage door problem much thought and consideration.

A large group of ingenious manufacturers, fully recognizing the problems of garage closures, have developed a host of excellent doors to meet an infinite variety of problems and tastes. There should be no valid reason why any modern garage door should not operate as easily as the front door of the home, and look just as attractive.

There are about six major types of garage doors on the market in a wide range of prices. These can be roughly classified as the roll-up or sectional door; the swing-up or panel type; sliding door; hinged doors; accordion doors and the two section upward-folding door. Upward-acting doors of one type or another are far (Continued on page 406)

CROSS-SECTION of a thick-edge slab, reinforced to form foundation and floor of garage

Illustrated above is one of the exclusive Raynor Carved Raised Panel designs. Raynor Mfg. Co. builds a door for every size residential, commercial and industrial door opening. Contact the nearest Raynor representative or write direct for detailed information and illustrations on the Raynor line.

BUILDERS are WISE—

...who take advantage of the appeal and satisfaction found in the Raynor complete line of Wood Sectional Overhead Doors. Features such as Patented Graduated Seal, co-ordinated construction,—built complete in the Raynor plant,—and many other outstanding features are your assurance that every installation equipped with a Raynor door will enjoy lasting dependable service.

RAYNOR MANUFACTURING CO.

River St., Dixon, Ill.
**OVERHEAD GARAGE DOORS**

- One-piece, single-width doors; easy to install, no maintenance.
- Sectional, single-width doors offer many exclusive features.

- One-piece double-width door has two full-length adjustable trusses.
- Sectional, double-width doors have two adjustable trusses.

Frantz, one of the largest manufacturers of overhead garage doors and hardware, offers a choice of one-piece or sectional-type doors for most openings. For further details please see your Frantz Dealer or write for Catalog No. 301.

**OVERHEAD DOOR HARDWARE**

For Custom and Mill-Made Doors

<table>
<thead>
<tr>
<th>OPENING W x H</th>
<th>WEIGHT OF DOOR HANDLED</th>
<th>SET NO.</th>
</tr>
</thead>
<tbody>
<tr>
<td>6'2&quot; to 6'7&quot;</td>
<td>100-150 lbs.</td>
<td>82</td>
</tr>
<tr>
<td>6'6&quot; to 7'0&quot;</td>
<td>100-150 lbs.</td>
<td>83</td>
</tr>
<tr>
<td>6'8&quot; to 7'0&quot;</td>
<td>60-95 lbs.</td>
<td>84</td>
</tr>
<tr>
<td>6'6&quot; to 7'3&quot;</td>
<td>100-150 lbs.</td>
<td>74</td>
</tr>
<tr>
<td>6'8&quot; to 7'3&quot;</td>
<td>100-150 lbs.</td>
<td>75</td>
</tr>
<tr>
<td>7'4&quot; to 8'0&quot;</td>
<td>150-250 lbs.</td>
<td>76</td>
</tr>
<tr>
<td>7'4&quot; to 8'0&quot;</td>
<td>150-200 lbs.</td>
<td>77</td>
</tr>
<tr>
<td>7'4&quot; to 8'0&quot;</td>
<td>200-300 lbs.</td>
<td>78</td>
</tr>
<tr>
<td>6'2&quot; to 6'7&quot;</td>
<td>100-150 lbs.</td>
<td>839</td>
</tr>
<tr>
<td>6'8&quot; to 7'0&quot;</td>
<td>100-150 lbs.</td>
<td>809</td>
</tr>
<tr>
<td>6'6&quot; to 7'3&quot;</td>
<td>100-150 lbs.</td>
<td>749</td>
</tr>
<tr>
<td>6'8&quot; to 7'3&quot;</td>
<td>150-250 lbs.</td>
<td>79</td>
</tr>
<tr>
<td>7'4&quot; to 8'0&quot;</td>
<td>150-250 lbs.</td>
<td>789</td>
</tr>
<tr>
<td>9' to 10'0&quot;</td>
<td>100-200 lbs.</td>
<td>810</td>
</tr>
<tr>
<td>9' to 10'0&quot;</td>
<td>125-225 lbs.</td>
<td>810</td>
</tr>
<tr>
<td>9' to 10'0&quot;</td>
<td>150-250 lbs.</td>
<td>93</td>
</tr>
<tr>
<td>9' to 10'0&quot;</td>
<td>150-250 lbs.</td>
<td>94</td>
</tr>
<tr>
<td>8' to 9'0&quot;</td>
<td>175-275 lbs.</td>
<td>716</td>
</tr>
<tr>
<td>7'4&quot; to 8'0&quot;</td>
<td>200-300 lbs.</td>
<td>782</td>
</tr>
<tr>
<td>9' to 10'0&quot;</td>
<td>200-300 lbs.</td>
<td>783</td>
</tr>
<tr>
<td>8' to 10'0&quot;</td>
<td>180-375 lbs.</td>
<td>718</td>
</tr>
<tr>
<td>8' to 10'0&quot;</td>
<td>210-425 lbs.</td>
<td>718</td>
</tr>
<tr>
<td>7'4&quot; to 8'0&quot;</td>
<td>240-475 lbs.</td>
<td>718</td>
</tr>
<tr>
<td>9' to 10'0&quot;</td>
<td>300-600 lbs.</td>
<td>912</td>
</tr>
<tr>
<td>10'1&quot; to 11'0&quot;</td>
<td>335-650 lbs.</td>
<td>912</td>
</tr>
<tr>
<td>9' to 10'0&quot;</td>
<td>375-720 lbs.</td>
<td>912</td>
</tr>
</tbody>
</table>

Frantz Overhead Door Hardware can be used with any carpenter-built or mill-made door, single or double-width, in heights to 12'. Proved and improved for more than 20 years. For further details see your nearest Frantz Dealer or write for Catalog No. 107.

**FRANTZ MANUFACTURING COMPANY**

STERLING, ILLINOIS
A PACKAGE DEAL
FOR
THE LUMBER DEALER
3 DOORS
TO GREATER PROFITS

CAPITOL PRODUCTS now offers you 3 fine garage doors that enable you to reach every market — to help you sell profitably, confidently and competitively.

CAPITOL FLUSH PANEL
Beauty and utility plus Taper Seal. Panels electronically bonded (not nailed) to frame — insures rigidity — prevents warping — stronger, lasts longer. Sizes: 8’ x 7”; 8’ x 7’6”; 8’ x 8”; 9’ x 7’. Thickness: 1 1/8”.

CAPITOL TAPER SEAL
The door for your average customer. Beauty with long, trouble-free life at reasonable cost—means faster sales for you—greater profits. Sizes: 8’ x 6’6”; 8’ x 7”; 8’ x 7’6”; 8’ x 8”; 9’ x 7”; 9’ x 8”; 10’ x 7”; 10’ x 8”; 10’ x 9”; and 10’ x 10’.

CAPITOL EASY LIFT
An attractive, competitively priced door with great appeal. “Timber Tape” treated — termite and rot proofed. Balanced, feather touch operation—long life. Sizes: 8’ x 6’6”; 8’ x 7”; and 9’ x 7’.

Doors are pre-drilled for lock hinges and handles—stop is also furnished.

(Continued from page 404)

AUTOMOBILE bumpers and tail pipes scrape the driveway unless careful calculation is made on grade variations. A change of not more than one inch per foot within any 10 feet of distance will usually allow adequate clearance in the lead in popularity with builders and home purchasers.

Prime consideration in planning any garage for the installation of an upward-acting door is provision for head room for the type of door to be installed. There are doors available to take care of all kinds of head room situations, with a number on the market which require no head room, some only two or three inches, on up the scale to others which require 15 to 16 inches. Stock sizes range from the smallest listed, which is 8 feet wide by 6 feet 6 inches high on up to the large full double garage width of 14, 15 and 16 feet. There are sectional roll-up doors available with removable center posts. Thus two or more doors can be installed to close a large opening and if found desirable, the center posts between the doors can be raised up and taken out of the way to provide a clear opening of any width structurally sound.

Manufacturers are bringing remote control by electricity or sound activation to garage doors at prices that often make it practical to install these units.

Their desirability and convenience to the home owner stem from the fact that the garage door can be opened or closed by merely pushing a button on the instrument panel or floor of the car. With garages fronting on the streets and being used more extensively as utility and storage structures, the need for keeping the door closed at all times is obvious. It not

(Continued on page 408)
Jobbers
Dealers
Builders—here is good news!

THE RELIABLE

Craw-Fir-Dor
OVERHEAD-TYPE GARAGE DOOR
is available again in quantity

Craw-Fir-Door No. 44
Craw-Fir-Door No. 45

This time-tested favorite is now available in any quantity you need. Immediate delivery is assured for popular Craw-Fir-Dors. Stocks of the easy-working Crawford hardware are now adequate to supply all demands for these units.

And the same outstanding Craw-Fir-Dor features are also back... attractive appearance in 2 styles; Douglas Fir durability, strength and weatherproof panels; automobile-type lock and keys... and low cost!

Pre-assembled Crawford hardware requires a minimum of handling and provides quick, easy installation and operation. Only 2" headroom is needed.

Sold only through lumber dealers, Craw-Fir-Dor is a fast-moving, profit building item... profitable for dealer, jobber and builder.

Be sure to include Craw-Fir-Dors in your next order of doors from mills of the Pacific Northwest door manufacturers!

APRIL 1952
Easy to Install . . . Lasting Satisfaction

ALLITH

50-50 PUSH-OVER

GARAGE DOOR HARDWARE

Combine the expertly-designed Allith garage door hardware with your own or any standard door. Result . . . a rugged, easily-operated overhead door that gives full and lasting customer satisfaction.

Quickly installed, standard set fits any opening up to 9' wide x 7 6" high when doors do not exceed 275 lbs. Other sets available for openings up to 10' wide x 10' high.

SEVERAL examples of garage framing showing practices which conform to common situations. Where there are storage rooms or living quarters above the garage, framing of course, is done to accommodate the extra loads. Exterior garage architecture and finish should closely match the house even though the garage is detached.

(Continued from page 408)

only obviates the danger of theft but also closes off from public view whatever weaknesses the home owner may have as a neat housekeeper where the garage is concerned. Because houses are designed to look their best with the garage doors closed, it is desirable that they be closed most of the time, whether the garage is attached or detached.

There are several different models of automatic door operators, but basically they consist of a simple sending unit mounted in the owner's car with an individual wave length set to activate the door operator mounted in his garage. His car unit will not open any other doors and no other owner of an automatic set of

(Continued on page 410)
Quick Installation and Trouble Free Performance — Always!

CHAMPION QUALITY
HAR-VEY ROLLING DOOR HARDWARE

Sizes for all Residential Doors

The Plywood Hanger (FW-6PH) is designed for plywood doors used on cabinets, closets, and similar installations. The Non-Adjustable Hanger (FW-6H) is designed for standard doors up to 100 lbs. The Adjustable Hanger (FW-6AH) is also for doors up to 100 lbs. and permits a 1" vertical adjustment of the door. In addition, Har-Vey Hardware is available for light wardrobe doors as well as for extra-heavy interior doors.

★ COMPLETELY RUSTPROOF — The durable, high-quality materials used for Har-Vey Hardware are completely rustproof — there's no corrosion to cause replacement or repairs.

★ POSITIVE LOCKING — A new engineering feature insures positive locking of the hanger to the door, for both the adjustable and non-adjustable models — hanger and door cannot become disengaged.

★ SMOOTH AND SILENT — Doors glide easily and softly on Har-Vey's new oil-cushioned Oilite bearings. These remarkable bearings are self lubricating, provide perpetual smooth rolling with no maintenance.

★ SIMPLE TO INSTALL — There's no trick to installation — any workman can handle details quickly and easily, with no special tools necessary.

The WARDROBE HANGER FW-5 is designed for wardrobe and cabinet doors under 35 lbs., offers several exclusive features: Doors can be hung from the outside (in a minimum of time), space between doors can be varied and any number of doors can be used in an installation. FW-5 Hanger and track are supplied as a package — details upon request.

Write for full details — Address Hardware Division "Q"
METAL PRODUCTS CORPORATION
807 N. W. 20th Street Miami, Florida
Western Division: Calmetco, Inc. 609 S. Anderson, Los Angeles, California

APRIL 1952

Please send me your free folder on rolling doors & Har-Vey Hardware

NAME __________________________
COMPANY _______________________
STREET _________________________
CITY ___________________________ STATE ________

©
MODERN TECHNIQUES in design and manufacture of automatic door operators make them efficient and trouble-free when properly installed according to manufacturer's specifications. A push button installed somewhere on the instrument panel of the car or on the floor is used to activate the mechanism from the car.

Photo & drawing courtesy Barber-Coleman Co.

Hardware

Proper installation is essential to good hardware and fittings. Follow strictly the manufacturer's specifications and directions on garage door and hardware installation, particularly on upward-acting types. Decide on the particular door to be installed before the rough opening is made so that it will fit the finished job, and so that any necessary headers and jamb framing members can be built in originally to keep the door plumb and rigid. Hardware of many types is available for the contractor who wishes to fabricate his garage door on the site. Follow manufacturer's instructions and avoid overloading or misuse of fittings and parts.

The renovation of old garages with new doors or with new hardware is an important aspect of remodeling work. Some companies offer hardware which will convert swinging or accordion doors to the upward-acting type.

Driveways

Poor driveway planning results in tricky turns, bad grades, obstructed views, accidents, and grief for the home owner. A one-car driveway should be at least eight feet wide on the straight and 11 feet wide on curves. The minimum width for 2-car drives is 15 feet, and wider is better. If the driveway slopes, there should be a level area the length of the car in front of the garage to prevent rolling if brakes are not set.

With modern automobiles, the smallest outside radius for a curve is 29 feet, and the smallest inside radius 18 feet. Curb returns at the roadway should be three to five feet in radius.

Sharp dips and sudden changes in grade are other faults to avoid. A change in grade of not over one inch per foot in any ten-foot stretch will allow adequate clearance for car overhangs. Slope the drive slightly to the sides for drainage.

Visitors and guests commonly park near the owner's driveway, and the garage and drive are frequently his first view of the place. This makes it essential that the driveway be in good order and the garage door attractive. Thanks to the ingenuity of designers and manufacturers, owners and builders can now obtain garage doors and fittings which are in excellent taste and make a handsome and inviting appearance.
9' x 7' RECEDING TRACK TYPE AND CANOPY

*Extra width gives extra clearance. No more bashed-up fenders from too-narrow garage openings. Horizontal line styling provides that wide, spacious look—new beauty for the garage. Swings open easily at a turn of the handle. Rugged, new 'X-type' steel bracing adds to the great strength and rigidity of the one-piece, all-steel door leaf. Deeper, stronger, steel frame. One-piece door leaf eliminates field assembly of separate sections; packaged hardware is factory-assembled. Installation is simple and easy. Requires less than 2" of headroom. Weatherstrip at bottom seals opening against drafts and snow.

8' x 7' RECEDING TRACK TYPE AND CANOPY

*New horizontal-line styling adds new beauty to this standard-width STRAND Door, and harmonizes with today's architecture. STRAND'S 8' x 7' Door is available in both Receding (Track) and Canopy Types. Wider, deeper frame gives greater strength. Ball-bearing rollers and strong adjustable springs assure easy, quiet and smooth operation of Receding Type. Strong adjustable springs do the lifting and permit easy opening and closing of Canopy Type. Requires less than 2" of headroom ... no interference with overhead ties or storage space. Heavy rubber weatherstrip at bottom of all-steel panel seals doors against drafts and snow. Can be trimmed to fit uneven floors. Factory-assembled hardware comes ready to install. Saves valuable installation time.

16' x 7' RECEDING TRACK TYPE

*The STRAND All-Steel, Horizontal-Line, Track- Type Door for double garages is shipped in two sections (each 8' x 7'), complete with necessary joining material and packaged, factory-assembled hardware. This beautiful double-width door assures the same easy, low-cost installation, and the same sturdy strength, ease of operation, and other advantages of STRAND Single Doors. STRAND Double-Garage Door eliminates the cost of building a center post—ensures an unobstructed opening 16' wide—and costs less than two Single Doors.
IF you are not a subscriber

THIS COUPON IS MEANT FOR YOU

MAIL IT NOW—while the extra-low rates are still in effect—and keep posted on all the latest building news—as it happens—as it directly affects you!

In these challenging times, a constant source of sound, qualified building information is a vital need that no forward-looking builder can afford to be without.

The advantage of knowing what to build and with what to build . . . the advantage of knowing how other builders are successfully solving today’s problems of labor and scarce materials . . . the advantage of money-saving ideas—short-cuts—new designs—new products—new building opportunities . . . These are the type of AMERICAN BUILDER advantages that pay for themselves—over and over again!

Send us your order today—and invest in your own building future!

"Biggest Bargain in the Building Field"
FOR AN Easy LIFT

McKEE OVERDOORS

WITH TWIN ROLLORS*
AND TWIN TORSION SPRINGS

*patented

McKee's patented Twin Rollors are furnished on all 1 3/4" overdoors. Each door section can be fitted snugly against the jamb by means of the twin adjustable Rollors. With twice as many rollers at each section joint, the door moves easier and reduces the wear on the rollers. The inclined track gives a weather-tight seal.

ELECTRONIC SERVICEMAN

Electric Serviceman is McKee's radio controlled residential electric operator. No coils to bury in the driveway. Just press the button in the car—the door opens automatically, the garage light turns on automatically!

Sold and serviced through nation wide McKee Distributors
Write Now For Catalog No. 19

McKee Door Company

110 HANKES AVENUE
AURORA, ILLINOIS

APRIL 1952
FACTS YOU SHOULD KNOW ABOUT THE

availability

OF PITTSBURGH CORNING GLASS BLOCKS

It isn’t necessary to tell you about the difficulties involved in obtaining certain building materials these days—because of short supply, or slow delivery. So, it’s big news—and reassuring to know—that such an important building material as PC Glass Blocks is immediately available and in ample supply! Also important to you is the fact that PC Glass Blocks involve no metal when used in small panels, and very little is required in large panels. In fact you can put in small panels of PC Glass Blocks—up to an area of 25 sq. ft.—without using wall ties, wall anchors or expansion strips. This adds up to a big saving in time, labor and material.

More and more builders are taking advantage of the immediate availability of PC Glass Blocks to speed up their work on new homes and on renovating jobs. They are using these glass blocks extensively around entrances, for cellar and other windows—as well as for bath stalls, room partitions and at stairwells. You’ll find it profitable to give more thought to the inclusion of PC Glass Blocks in all your work.

Other Facts: PC Glass Blocks admit adequate daylight and assure privacy; they have high insulating value, are easily cleaned, deaden outside noises, stop infiltration of dust and grit; rarely need repairs; never require painting.

Mail this coupon for FREE booklet... Now!

Pittsburgh Corning Corporation
Dept. 8-42, 307 Fourth Avenue
Pittsburgh 22, Pa.

Please send me a copy of your FREE booklet, "More Light, More Beauty, More Comfort in Your Home."

Name

Address

City ........................................ State

414 AMERICAN BUILDER
THE WALL OF GLASS and "picture window." are characteristic of modern design for increasing livability in both lower-priced and more expensive homes.

From the time that glass was first discovered or invented by some ancient Egyptian, it has been used by men for ornamental purposes. However, with the exception of the homes of the rich, glass played very little part in the lives of every-day people due to the crude and cumbersome methods of manufacture. The old method of making crown glass used by the Romans continued in use until after 1800 A.D., when the hand cylinder process was developed. Not until 1903 was glass-making mechanized by the machine cylinder method, and improved in 1917 by the sheet-drawing method, which is used to make most window glass today. Modern technology has made phenomenal advances in both process and product in glass manufacture, by far the greater part of it in the last 30 years, with improvements coming faster and product applications multiplying every year.

MODERN USES OF GLASS

Continuous window glass manufactured by the sheet-drawing method now makes it possible to produce the complete piece of glass, ready to ship, 10 hours after the raw materials reach the factory. Seventy-five per cent of all window glass is used in single strength thickness, the remainder being either double strength or greater.

HOW TO LAY GLASS BLOCK

(1) BRUSH HEAVY COAT of asphalt on

FOR SIMPLIFIED INSTALLATION of 6 inch and 8 inch glass block in residential construction: (1) Make panels not in excess of 25 square feet, with maximum width of 5 feet and maximum height of 7 feet. Larger sizes require standard installation including expansion joints, and wall ties. (2) Panels are not load bearing, must be framed with lintel support at head. (3) Recommended mortar mix is one part portland cement, one part hydrated lime, 4 to 6 parts plastering sand. (4) Brush heavy coat of asphalt 3 1/2 inches wide on sills and jambs; lay block using mortar joints 1/4-inch thick. Tool joints to smooth finish and clean panel; caulk with waterproof mastic compound.

(2) APPLY MORTAR joints 1/4-inch thick

(3) LAY BLOCKS with full mortar joints sills and jambs

(4) CLEAN OFF loose mortar. Caulk with mastic

APRIL 1952
Sheets measure up to 100 by 120 inches. Coloring and tinting for special purposes is also provided, to reduce glare, permit more sunlight to enter, and for other purposes.

In modern design the "wall of glass" has been much used. It permits a greater illusion of space in homes built with minimum floor space, a terrace or garden becoming a logical continuation of a room. Solar orientation of homes, using generous glass areas has been widely touted as making for better lighting and more enjoyable living.

Solar heating, considered by many as still being in the developmental stage, depends for its effectiveness upon the use of large areas of glass to receive the sun's rays and transmit them to the heat transfer and heat storage equipment involved in the system. Glass pipe is being used in some installations for soil pipe and other purposes, and in other ways glass products are finding increasing application in modern design for comfortable living.

**Interior Walls and Partitions**

"Open design" in modern living has meant the disappearance of traditional walls and partitions in many structures, so that the economical use of floor space might still permit a sense of spaciousness in the dwelling. With the virtual elimination of the dining room in favor of a dining nook or dining space at one end of the living room, plus the open kitchen feature, many designers have found that glass partitions, or partial partitions, add a sense of privacy and separation to the functional areas of the floor plan without destroying the over-all sense of spaciousness desired. These partitions may be glass block, or corrugated and patterned glass available in a wide range of patterns. In many instances, structural glass panels or architectural glass "tile" are utilized in producing both attractive and extremely serviceable walls for kitchens, bathrooms, utility rooms, and other spots where a bright, shiny surface is desired and where ease in cleaning is essential.

**WALLS OF GLASS**, fixed as well as movable are becoming increasingly popular in houses in all price ranges

**SEALED WINDOWS** of fluted opaque glass admit light and maintain privacy. Wood louvres ventilate

**HALLWAY** is transformed to attractive, light area with glass block wall treatment. Casement window at left
HEAVY PLATE GLASS is used for effective sliding panel treatment between kitchen and laundry.

Large mirror areas are much used both for the beauty of the surface and for the additional sense of depth and space which they give. Mirrors today are backed with silver, gold, or gun metal, and may be made of ordinary window glass, water-white plate glass, or of blue or flesh-tinted plate. Some are as large as 14 by 7 feet. Many charming possibilities exist, ranging from lining one entire wall of a room with mirrors to the mirror over the fireplace flanked by glass block. Some designers also consider the seeing-around-corners angle, so that many parts of the house are visible from almost any spot within the house.

Alocves with glass panels or complete glass walls are added as attractive features in some designs, and both bent glass and plate glass are frequently used in decorative cornices, shelving, counter tops, and trim. Special effects can be achieved with color, mural designs by etching or sand-blasting and other means. Glass for louvres in doors between rooms and in ventilators, both glass block and in connection with picture windows, has been found convenient and practicable. Some manufacturers produce a louvre-type window with movable glass louvres.

PLENTY of light without sacrifice of privacy achieved in powder room treatment; sense of spaciousness is gained through use of mirror-wall.

Glass for Decoration

GLASS BLOCK forms non load-bearing partition to screen entrance from living room.

PATTERNED SHEET GLASS adds privacy to dining alcove while admitting light from other rooms.

Almost any spot within the house.

Light Commercial and Industrial Uses of Glass

Glass plays a prominent part in modern store design. The old-fashioned store window, if not eliminated in the trend towards putting the whole store in the window, is at least modernized with larger glass areas, glass back panels, and architectural colored glass surfacing on the store front. Tempered plate glass doors and windows reaching from floor to ceiling combined with modern fluorescent lighting make for dramatic entrances and displays for commercial buildings of many types. The perpetually shining, clean, and colorful appearance...
GLASS BLOCK custom-built shower stall keynotes bathroom with walls of structural glass "tile" of a building faced with architectural glass gives impetus to the store's merchandising activities, and offers builders numerous opportunities for remodeling and store modernization. Glass block, both for lighting and decorative effects, has an equally important place.

Interior walls of architectural glass add not only beauty but additional light by reflection and this increases the impact of the merchandising design and display. Small office buildings find that glass block and structural or patterned glass panels provide privacy, some measure of sound control, and at the same time increase the admitted sunlight to the point where foot-candles delivered to each desk are at a comfortable level.

Air Conditioning
There is an increasing demand on the part of tenants of office buildings and commercial structures for more or less complete air conditioning. The double-pane window with insulative dead air space, and the glass block composed of two lenses with entrapped air both provide a measure of insulation and facilitate temperature and humidity control. Small industries such as dairies, candy manufacturers and bakeries, have found that glass block walls not only provide more light without glare but also reduce condensation on interior wall surfaces, as compared to ordinary glass; and by maintaining relatively higher temperatures on inside surfaces in winter and cooler temperatures in summer such walls reduce the load on the heating and air conditioning units installed in the building.

Skylights and Roof Hatches
The old glass skylight is being replaced with modern plastic-glass or wire-glass, in some cases colored or tinted. Roof hatches of plastic and plastic glass are also available; so that interior rooms and arcways may receive additional light, weather protection, and provide security. In some instances, where an industrial building is roofed, for example, with corrugated metal sheets, some of the roofing sheets may be replaced with structural corrugated glass or plastic glass materials; this increases available light and does not increase heat loss from the building.

Cabinets, Displays, Decoration
In addition to factory-built glass cabinets and display counters, there are many opportunities in store modernization for the builder to profit by the installation of attractive displays utilizing glass panel, sliding glass doors, and similar materials.

Glass on the Farm
Glass block in particular is finding increasing use in farm buildings, and is being installed in both new and old structures to provide light and maintain the insulating quality of masonry (Continued on page 420)
Here is the doorway opposite but with a panel of regular single glazed glass. With a random clear glass block panel, prying eyes cannot see inside.

By night, the entranceway glows with a light that radiates welcome to friends. By day, inside rooms are flooded with natural daylight.

GLASS BLOCK “GOES” WITH ANY ARCHITECTURE

Whether a home is traditional or modern, it can have the advantages of Insulux Glass Block®. Block patterns are available in a wide variety of face designs that “go” with any architectural design.

What other material offers you the opportunities to create such interesting, new architectural effects that are so decorative . . . so useful . . . yet so practical?

For information, write to Insulux Division, American Structural Products Company, Box 1035, Toledo 1, Ohio;

INSULUX GLASS BLOCK
A product of the Owens-Illinois Glass Company
AT LEFT: typical units are built in combinations of one or nine. Right: sections through window wall using 2 by 6 members for frame

(Continued from page 418)

or wood walls. Farm homes, of course, offer the same opportunities for modernization and application of all types of glass for windows and ornamentation as do other residences.

TYPES OF GLASS

There are many types of flat glass available to the builder today which were unheard of 30 years ago. In addition to the centuries-old spun glass or crown glass and blown glass, there are heavy drawn and fluted drawn sheet glass, polished plate, rough plate, rolled sheet, fluted rolled, rough cast, figure rolled, tempered plate, opal and colored opal, safety glass, pressed glass, ultra-violet glass, heat-resistant glass, and a host of others including corrugated, glass block, and architectural glass.

Sheet Glass

Sheet glass used for windows is commonly single strength. The safe glazing size must always be considered so that the glazed area will have sufficient strength to withstand wind stresses. The table below summarizes this information and indicates some of the basic sizes of window glass available.

PLEXIGLAS blister skylights throw direct sunlight into rooms

PLASTIC MATERIALS permit curved contours that are smooth, shining, sanitary, permit use of colors, may be transparent or opaque

420 AMERICAN BUILDER
STORE FRONTS can be modernized with tempered plate glass, with doors and windows designed for maximum visibility and ability to withstand heavy use.

<table>
<thead>
<tr>
<th>Weight per sq. ft.</th>
<th>Thickness</th>
<th>Manufactured Sizes</th>
<th>Safe Glazing Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>15 oz.</td>
<td>3/16&quot;</td>
<td>60 x 40&quot;</td>
<td>24 x 24&quot;</td>
</tr>
<tr>
<td>21 oz.</td>
<td>1/8&quot;</td>
<td>81 x 42&quot;</td>
<td>30 x 30&quot;</td>
</tr>
<tr>
<td>26 oz.</td>
<td>1/8&quot;</td>
<td>81 x 45&quot;</td>
<td>35 x 35&quot;</td>
</tr>
<tr>
<td>32 oz.</td>
<td>3/16&quot;</td>
<td>74 x 49&quot;</td>
<td>40 x 40&quot;</td>
</tr>
</tbody>
</table>

Sheet glass is made in various qualities: "firsts" for cabinet work; "seconds" for picture framing and glazing; "thirds" for houses, schools, and offices; "fourths" for general glazing; and "horticultural" for greenhouses. Heavy drawn sheet glass is used as a substitute for plate in cheaper construction.

**Plate Glass**

Plate glass contains more lime and less soda and magnesia than sheet glass, and is made by the semi-continuous method of rolling, while sheet glass is made by the fully continuous method of drawing. Prior to 1923 plate glass was made by pouring molten glass onto a casting table. Plate glass is ground and polished, which may remove as much as half of its original thickness, leaving a smooth, glossy, and optically true glass, structurally sound and highly attractive. Thicknesses range from 1/8 inch to 1/4 inches and sheet sizes are available up to 127 by 286 inches.

Heat-absorbing plate glass excludes much of the heat in the sun's rays while transmitting most of the light. It is especially useful in industry where it is desirable to reduce interior temperatures which would otherwise be raised by the sun's heat. Exclusion of this solar heat means substantial savings of cooling costs in air-conditioned buildings. Such glass may be plain, corrugated, or wire-meshed.

**Tempered Plate Glass**

Tempered plate glass is made by re-heating a piece of plate glass and then rapidly cooling the surface with air jets. This sets up a system of balanced stresses and strains in the material which makes it many times as strong as ordinary plate glass. It cannot be cut once it has cooled, for this would shatter the balance of strain and stress and reduce the whole piece to fragments. Consequently, it must be cast to exact size before it is tempered.

Widely used in modern store fronts and entrances, as well as in display cases and some shower stalls, tempered plate glass is available in a wide range of colors, and may also be colored on one side for use in signs and lighted displays.

**Patterned and Diffusing Glass**

The use of obscure glass to prevent vision while admitting light is not new, but in recent years manufacturers of glass have come up with a wide range of attractive designs worked into the surface of both sheet and plate glass, either by pressing, etching, or sandblasting. The size of the individual pane of glass and the amount of vibration which it will receive from walking or street traffic will govern the thickness of the glass to be used.

If protection against breakage and fire, as well as privacy, are desired, a figured wire glass may be installed. Glare reduction and heat reduction are also built into various types of...
PLAIN SHEET GLASS windows form sound-control interior panels in well-lighted architect's office.

WHITE CORRUGATED plastic panels mesh with galvanized iron sheet sidings, provide light with privacy.

obscure glass for industrial and commercial purposes.

**Double Glazing**

Few modern homes are being built today without at least one large double-glazed picture window. A double-glazed unit is composed of two lights of glass held in place with a metallic spacer and rubber bond, making an hermetically sealed air space. In some instances, windows may be similarly triple glazed, and a few cases have had as many as five lights of glass separated by sealed air spaces.

Double-glazed units are available in approximately 50 standard sizes ranging from 35 1/2 by 36 inches to 72 by 96 inches. When needed, special sizes may be obtained. Installation can best be accomplished by following closely manufacturer's instructions, which include roughly the following data:

1. Openings must be square, free of twists or glazing obstructions. Units should not be set in poorly constructed frames inadequate to bear the weight of the sash (6 lbs. per sq. ft.).

2. Sash must literally float in the opening.

3. Use of elastic glazing compound is recommended. Do not use putty.

4. Two lead or treated wood setting blocks as wide as the thickness of the unit are to be placed one-fourth of the opening width from each end of the unit.

5. Place sufficient glazing compound on the back of glazing rabbit. This allows unit to be positioned, filling voids behind edge of glass.

**Structural Glass**

Structural glass was originally developed for sanitary purposes for washroom partitions and walls, but is now widely used also for store fronts and similar installations. Stronger and cheaper than either marble or tile, it is uniform in size, available in many different colors, and provides a permanent exterior surface of durability and beauty. It is not tempered, and may be cut, laminated, or otherwise worked in process of construction. It is also popular for bathrooms and kitchens.

Corrugated structural glass, a heavy cast or rolled glass, is available either clear or sandblasted, and may be obtained in two corrugations, one with waves one inch deep on 2 1/2-inch centers, and the other 3/4 inch deep on 2 1/2 inch centers. The former meshes with structural steel corrugated siding and may be installed along with corrugated steel in industrial buildings.

**Architectural Glass**

Architectural glass, as a special classification, is similar to obscure or patterned glass, but it includes as a group those sheets or panels which have very deep corrugations or patterns and are frequently patterned on one side and flat on the other. Surface finishes may be clear, fire-polished, matte, mirrored, sand-fused; actual (Continued on page 427)
PUT EXTRA APPEAL INTO YOUR HOMES WITH PLENTY OF

Pittsburgh Glass

POLISHED PLATE GLASS
All types of homes, even in the low-price class, can make efficient use of this aristocrat of flat glass products. In picture windows, shelves, furniture and cabinet tops, shower doors, bar and table tops, sill covers and push plates, it lends smartness and appeal. It is brilliant and accurately reflective of surface; it permits clear, undistorted vision at any angle. Thicknesses from 1/8" to 1 1/4".

SOLEX HEAT-ABSORBING PLATE GLASS
Solex Heat-Absorbing Plate Glass provides the ultimate in comfort for rooms exposed to the direct rays of the sun. While transmitting 70% to 75% of the sun's total light, the soft, greenish tint of Solex absorbs solar radiation and keeps the interior 10 to 20 degrees cooler than outside temperature. Glare is reduced and fabrics and carpets are protected against bleaching action of the sun's rays. "The best glass under the sun" is available in 3/8" thicknesses.

FOR YOUR COMMERCIAL JOBS, TOO
You'll find all the products you need for store modernization in the complete line of Pittsburgh Store Front Materials. These include Plate Glass, Carrara Structural Glass, Twindow Insulating Units, Pittsburgh Mirrors, PC Glass Blocks, Pittsburgh Doorways, Herculite Doors, Pittsburgh Paints and Pittco Store Front Metal. Free, illustrated literature, showing how you can use glass effectively in store modernization jobs, will be sent to you on request.
TWINDOW, Pittsburgh's window with built-in insulation, is as simple to install as a single pane of glass. Completely prefabricated, it consists of two or more pieces of glass enclosing a small hermetically sealed air space.

The entire edge of each TWINDOW Insulating Unit is encased in a stainless steel channel. This channel protects the seal as well as the edges of the glass during handling and provides a firm and even edge for installing.

TWINDOW adds an exceptional amount of "buy-appeal" to any home. It admits an abundance of daylight, frames a striking view. It cuts heat loss and eliminates down-drafts. Under normal conditions, it reduces the tendency for condensation to form.

For the ultimate in comfort, install Solex TWINDOW. The inside light is regular plate glass, but the outside light is green tint Solex Heat-Absorbing Glass that keeps out heat and glare while admitting plenty of useful light.

HOW TO GLAZE

1. Openings must be square, free of twists and glazing obstructions. Units should not be tilted in flimsily constructed frames, inadequate to bear the weight of TWINDOW, or frames of green wood which will warp later in drying out, then introducing a strain in the TWINDOW setting.

2. To avoid glass breakage, TWINDOW, especially in large units must literally float in the opening, as shown in the diagram below.

3. Place only a small amount of glazing compound at the back of the glazing rebate. This will permit the unit to be positioned more easily than if glazing rebate is full. Fill the void behind the edges of the TWINDOW unit and apply face glazing compound before the stop is set.

4. If TWINDOW units are to be installed in the standard steel sash, special TWINDOW unit wire glazing clips are available, bent to accommodate the additional thickness of TWINDOW.

PICTURE WINDOW GLAZING

- GLAZING COMPOUND: Exclusive use of elastic glazing compound or other material that retains some resilience permanently.
- LATERAL CLEARANCE: At least ⅛" for glazing compound.
- EDGE COVERAGE: Stainless steel channel-covered for uniform appearance and maximum edge insulation.
- SETTING BLOCKS: Two, lead or treated wood, 3" to 4" long, located ¼ of the width in from each end of the unit on all units wider than 36" or heavier than 50 lbs. Shims equally helpful in spacing smaller, lighter units.
- STOP: Glass stop does not bear on unit.

PITTSBURGH PLATE GLASS COMPANY
## TWINDOW Standard Sizes for Picture Windows

Twindow Insulating Units Composed of 2 Pieces of Polished Plate Glass with \( \frac{1}{2}'' \) Air Space

<table>
<thead>
<tr>
<th>GLASS WIDTH</th>
<th>HEIGHT</th>
<th>SASH WIDTH</th>
<th>HEIGHT</th>
<th>SASH MANUFACTURER</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>GROUP I</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>48(\frac{1}{2})&quot; x 46</td>
<td>4&quot; x 4&quot;</td>
<td>Anson &amp; Gilkey, Merrill, Wis.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>56(\frac{1}{2})&quot; x 46(\frac{1}{4})</td>
<td>5&quot; x 4&quot;</td>
<td>Curtis Companies, Inc., Clinton, Iowa &amp; Wausau, Wis.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>72(\frac{1}{2})&quot; x 46(\frac{1}{4})</td>
<td>6&quot; x 4&quot;</td>
<td>Farley &amp; Loetscher Mfg. Co., Dubuque, Iowa</td>
<td></td>
<td></td>
</tr>
<tr>
<td>48(\frac{1}{2})&quot; x 50</td>
<td>4&quot; x 4&quot;</td>
<td>Hugill Mfg. Co., Muscatine, Iowa</td>
<td></td>
<td></td>
</tr>
<tr>
<td>56(\frac{1}{2})&quot; x 50</td>
<td>5&quot; x 4&quot;</td>
<td>Morgan Co., Davenport, Iowa</td>
<td></td>
<td></td>
</tr>
<tr>
<td>64(\frac{1}{2})&quot; x 50</td>
<td>6&quot; x 4&quot;</td>
<td>Rock Island Millwork Co., Rock Island, Ill.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>72(\frac{1}{2})&quot; x 50</td>
<td>7&quot; x 4&quot;</td>
<td>Semling-Makou Co., Merrill, Wis.</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>GROUP II</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>64(\frac{1}{2})&quot; x 46</td>
<td>5&quot; x 4&quot;</td>
<td>Andersen Corporation, Bayport, Minnesota</td>
<td></td>
<td></td>
</tr>
<tr>
<td>48(\frac{1}{2})&quot; x 50</td>
<td>4&quot; x 4&quot;</td>
<td>Cupples Products Co., St. Louis, Missouri</td>
<td></td>
<td></td>
</tr>
<tr>
<td>56(\frac{1}{2})&quot; x 50(\frac{1}{4})</td>
<td>5&quot; x 4&quot;</td>
<td>Andersen Corporation, Bayport, Minnesota</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>GROUP III</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>35(\frac{1}{2})&quot; x 36</td>
<td>3&quot; x 3&quot;</td>
<td>Cera Steel Products Co., Chicago, Ill.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>50(\frac{1}{2})&quot; x 36</td>
<td>4&quot; x 4&quot;</td>
<td>Hopes Windows, Inc., Jamestown, N. Y.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>56(\frac{1}{2})&quot; x 36</td>
<td>5&quot; x 4&quot;</td>
<td>Mackinster Iron Co., St. Louis, Mo.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>64(\frac{1}{2})&quot; x 36</td>
<td>6&quot; x 4&quot;</td>
<td>J. S. Thone Co., Philadelphia, Pa.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>50(\frac{1}{2})&quot; x 47(\frac{1}{2})</td>
<td>4&quot; x 4&quot;</td>
<td>Trojan Steel Co., Youngstown, Ohio</td>
<td></td>
<td></td>
</tr>
<tr>
<td>56(\frac{1}{2})&quot; x 47(\frac{1}{2})</td>
<td>5&quot; x 4&quot;</td>
<td>The sizes included were developed in cooperation with the Metal Window Institute, an association of steel sash manufacturers, to be used as picture windows in steel sash, with or without flanking casement windows.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>64(\frac{1}{2})&quot; x 47(\frac{1}{2})</td>
<td>6&quot; x 4&quot;</td>
<td>Sash and frames also available without flanking casement windows.</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>GROUP IV</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>44(\frac{1}{2})&quot; x 52(\frac{1}{2})</td>
<td>4&quot; x 4&quot;</td>
<td>Aluminum Window Corp., Garden City, L. I.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>58(\frac{1}{2})&quot; x 52(\frac{1}{2})</td>
<td>5&quot; x 4&quot;</td>
<td>Sash and frames also available without flanking double hung windows.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>72(\frac{1}{2})&quot; x 52(\frac{1}{2})</td>
<td>6&quot; x 4&quot;</td>
<td>(&quot;UNIFAX&quot; PICTURE WINDOW GROUPS)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>GROUP V</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>44(\frac{1}{2})&quot; x 66</td>
<td>4&quot; x 4&quot;</td>
<td>Farley &amp; Loetscher Mfg. Co., Dubuque, Iowa</td>
<td></td>
<td></td>
</tr>
<tr>
<td>58(\frac{1}{2})&quot; x 66</td>
<td>5&quot; x 4&quot;</td>
<td>(&quot;UNIFAX&quot; PICTURE WINDOW GROUPS)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>72(\frac{1}{2})&quot; x 66</td>
<td>6&quot; x 4&quot;</td>
<td>Sash and frames also available without flanking casement windows.</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>GROUP VI</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>48 x 48</td>
<td>4&quot; x 4&quot;</td>
<td>Rolscreen Co., Pella, Iowa</td>
<td></td>
<td></td>
</tr>
<tr>
<td>64 x 56</td>
<td>6&quot; x 4&quot;</td>
<td>Sash and frames also available without flanking casement windows.</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>GROUP VII</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>42 x 56</td>
<td>3&quot; x 3&quot;</td>
<td>Six miscellaneous even inch sizes have been added for simplicity.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>56 x 56</td>
<td>4&quot; x 4&quot;</td>
<td>These sizes are not intended for any specific type of sash.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>64 x 56</td>
<td>5&quot; x 4&quot;</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Twindow units in all groups may be stop glazed in structural wood members without using sash as such.

*Extreme care should be taken that any built-up wood members are true, structurally sufficient to support the weight of Twindow, and constructed from well-seasoned wood.

*Twindow sizes in all groups may be reversed, width and height, making, in effect, 94 sizes.
CARRARA STRUCTURAL GLASS

FOR BATHROOMS. When you use Carrara Glass on bathroom walls, you give buyers a plus value they can readily see. Carrara is so attractive in appearance . . . so easy to keep clean and sparkling at all times.

FOR SILLS. Waterproof Carrara sills are the kind of added feature that makes your house stand out above all others on the market. They are both attractive and highly practical.

FOR TUB SURROUND. Prefabricated Carrara units are available for use in bathroom recesses. Panels are shipped to your job ready to install with all cut-outs made and holes drilled to your specifications. No cutting is necessary on the job. You have a variety of colors and a choice of 24- or 28-inch panels.

FOR TRULY DISTINCTIVE, EASILY-SOLD HOMES, give people the added beauty and advantages of Carrara Structural Glass. Like fine Plate Glass, Carrara is mechanically ground and polished to a flawless, brilliant surface. It is unmatched in color, richness and elegance. It lasts indefinitely and is easily kept clean and sparkling with a damp cloth. 10 colors to choose from.

PITTSBURGH MIRRORS

PITTSBURGH DOOR MIRRORS. Several full-length door mirrors made of Pittsburgh Plate Glass — installed in bedrooms and entrance halls, for example — give your homes that "extra-value" look. The additional cost is slight and well worth while. Five standard sizes: 16, 18, 20, 22, 24" wide x 68" high — fit 90% of all interior millwork doors.

PITTSBURGH STRUCTURAL MIRRORS. To make rooms look larger, dark corners brighter, nothing can equal well-placed Pittsburgh Structural Mirrors. They are made from genuine Pittsburgh Plate Glass and offer superior reflectivity.
PANELS OF GLASS BLOCK admit flood of daylight that is softened and diffused throughout entire office

(Continued from page 422)

materials may be those of ordinary glass, Pyrex chemical-resistant glass, or colored in various hues.

Glass Block

Glass blocks are made of two sections, or lenses, fused together with a hollow, moisture-free chamber between. This dead air space makes an effective temperature barrier. Mortar edges are coated with a grit-bearing plastic coating to insure adherence to the mortar. Masons with ordinary tools can lay glass block without difficulty. In most installations it is necessary to use an expansion strip at jambs and heads of panels, plus a good gun-grade non-hardening caulking compound around all joints. Wall ties and panel anchors may be used to tie the panel to the masonry wall and to anchor the panel to the jambs.

Glass blocks have a compressive strength of between 400 and 600 pounds per square inch. However, glass block construction should never be used for load-bearing walls, and adequate provision must be made for support of construction above glass block panels.

Blocks are available in a wide range of patterns and several standard sizes, including radial blocks and curved corner blocks. Some manufacturers are offering "prefabricated" panels of glass block, and one at least is marketing a complete window unit in steel frame with sliding vision strip at the bottom. Ventilator blocks with stainless steel or glass louvers are also available to provide ventilation in situations where a solid glass block wall panel is not desirable.

Mirrors

Mirrors are sometimes made of ordinary drawn sheet glass, but better grades utilize polished plate glass, with highly polished surfaces and backs of either silver, gold, or casting bronze. Maximum sizes of mirrors are governed by maximum sizes of plate glass. Copper back mirrors are made up to 86 by 168 inches.

Mirrors may be fabricated with beveled edges 1/4 inch to 2 inches in width; the edges may be ground or polished and also mitered where mirrors butt together at an angle. Mirrors may also have surface-mitted lines where decorative effects are desired, or may be etched or sandblasted with decorative patterns. They are also obtainable in a wide range of color.

PLASTIC GLASS PRODUCTS

There are two main types of plastic glass products: those which are "pure" plastic, and those which are a combination of glass and plastic. The well-known "plexiglas," bombardier's lookout in military aircraft finds its civilian counterparts in roof hatches and skylights, in "blister" which admit sunlight into modern ranch-type homes, in shower screen installations, decorative interior panels and partitions of many kinds.

Among plastic and glass combinations are the familiar types of security glass and more recent types developed to reduce shattering of glass. One popular plastic and glass material comes in a number of attractive colors, is frequently corrugated to correspond with the corrugations in metal sheet, and is used extensively in roof panels, siding, as awnings over doors and entrances, and on edge as interior partitions. It may be cut, sawed, and nailed and otherwise worked very much like wood. It does not shatter like glass, but has all of glass's normal
CAULKING COMPOUND being applied around outside of window frame to insure weather-tightness

heat-resistant and weather resistant quality. It is available with 2½ inch corrugations in 8, 10 and 12 foot lengths and in widths from 26 to 40 inches, as well as in other sizes and in corrugations up to 4.2 inches.

GLAZING AND CAULKING COMPOUNDS

For glazing wood sash, it is recommended that putting putty or whiting putty and white lead conforming to U.S.G.M. Spec. No. 283 be used. For glazing metal sash, use whiting putty with 5 per cent litharge or a metal sash elastic glazing compound. FHA specifications which call for whiting putty require a type consisting of finely powered natural chalk, a minimum of pure tinting color, and pure raw linseed oil.

Elastic glazing compounds differ from ordinary putty chiefly in that specially treated oils are used so that the compound will remain elastic even under extreme conditions of vibration and exposure to the elements.

Litharge, which is lead oxide, is added to putty to make it set from the bottom rather than just skimming the top. White Lead and Whiting Putty consists of 10 per cent white lead with regular whiting putty. However, the trend today is definitely towards proprietary mastic glazing and caulkling compounds. These are easy to use, are said to remain permanently elastic, are unaffected by heat and cold, do not harden in the container, and do not waste before being used, as is frequently the case with small amounts of unused putty. While many caulking compounds are today used for application by gun or from a tube, some are made in pre-moulded strips for easy application by hand. Almost all are available in a wide range of tints to match wall surfaces.

SPECIFICATIONS FOR POLISHED PLATE GLASS

General Principles Involved in Grading Glass—All flat glass contains some imperfections and the principle employed in grading is to exclude all defects that would be objectionable in a given grade. This is difficult to do since there are sharp lines of demarcation between grades, and experienced inspectors will differ in judgment as to the limits of the grades. Small lights must be quite free from imperfections, as compared with larger ones, and the center of any sheet should be clear, whereas the edge may contain more pronounced defects.

Method of Examination—The method of examination is described in these specifications in order to make the results more uniform, and to determine the condition under which glass should be examined because the distance from the glass, the angle between the glass and the line of sight, and the intensity of light all affect the visibility of imperfections.

These specifications should be interpreted by examining the glass in the following manner, with reference to the definitions of defects listed in the glossary:

The glass should be examined when placed in a position similar to that of a glazed light with the observer's eye on a level with the center of the sheet, and looking through the glass from a distance of about 36 inches into the light from a clear sky without any sun or any close background.

The visibility of waves, lines or cords depends chiefly upon the angle of observation, and the intensity of these defects can be classified on this basis. The values given for angles are the angles the line of sight makes with the sheet of glass when in a vertical position. Slight movement of the head horizontally through an angle of two or three degrees will make waves or lines more perceptible.

Acceptance or Rejection—Acceptance or rejection of a shipment or delivery should be based on an examination of the following quantities:

For orders of 100 lights or less, all should be examined; for orders of 101 to 500 lights, at least 50 per cent should be examined; for orders of 501 or more lights at least 25 per cent should be examined. Boxes are selected from the shipment at random.

If not more than 10 per cent of the lights examined are below quality, the shipment should be accepted provided the lights below the specified grade are not distinctly below the upper limits of the next lower grade.

If, however, an entire shipment of 500 lights or more is examined, not more than 5 per cent may be below quality.

Sizes and Thicknesses—The standard of thickness of plate glass are ½, ¾, ¾, 1, 1¼, 1½, 1¾, 1¾, 1¾, 1¾, and 1¼ in. Sheets are available ¾ in. thick in sizes having a maximum area of 250 sq. ft. Glass of ½ in. thickness may be furnished having almost any desired dimension under the following maximums: 120 x 280 in., 144 x 260 in., 160 x 240 in.

Tolerance in Thicknesses—The maximum and minimum thicknesses allowed should not be more than given thickness plus or minus one-half the difference between the standard thicknesses. The general variation in thickness should not be more than ½ in. for individual lights under 10 square feet in thickness up to ¼ in. The variation in lights over ¼ in. in thickness should not exceed one-half the total tolerance for that thickness.

Polished plate glass ½, ¾, and 1¼ in. thick is carried in stock in the larger cities.

Tolerance in Dimensions—Variation from dimensions ordered should not be more than ½ in. per ½ in. thickness.

Grades—Plate glass should be furnished for glazing purposes in one of two grades as specified. These grades are known as silvering and glazing qualities.
Details on Curved Glass Block Panel Construction

Glazing Details for Double-Glazed Sealed Insulating Glass Units

It is extremely important to remember that double-glazed sealed insulating glass units are factory-fabricated and, once made to specifications, their dimensions cannot be changed at point of use. Proper glazing clearances must be allowed on all units, as well as sufficient rabbet depth, so that the seal does not show. The chart below gives recommended data:

| Glass Size             | under 80 inches | under 80-120 inches | under 120 inches | under 80 inches | under 80-120 inches | under 120 inches | under 80 inches | under 80-120 inches | under 120 inches |
| A - Glazing compound  | A | A | A | A | A | A | A | A | A |
| Bed - Width             | A | A | A | A | A | A | A | A | A |
| B - Glazing Clearance | A | A | A | A | A | A | A | A | A |
| (all edges)             | A | A | A | A | A | A | A | A | A |
| C - Metalized Edge     | A | A | A | A | A | A | A | A | A |
| Depth                  | A | A | A | A | A | A | A | A | A |
| D - Total Rabbet       | A | A | A | A | A | A | A | A | A |
| Depth                  | A | A | A | A | A | A | A | A | A |

*Allowance made for dimensional tolerance.
Sum of length plus width.

Heat Transmission Table on Double-Glazed Sealed Units

<table>
<thead>
<tr>
<th>Description</th>
<th>Glass Thickness</th>
<th>Air Space</th>
<th>1 Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Single Glass</td>
<td>1/4&quot;</td>
<td>None</td>
<td>1.16</td>
</tr>
<tr>
<td>Double Thermopane (one air space)</td>
<td>1/4&quot; or 1/2&quot;</td>
<td>0.55</td>
<td>0.58</td>
</tr>
<tr>
<td>Triple Thermopane (two air spaces)</td>
<td>1/4&quot; 1/2&quot;</td>
<td>0.65</td>
<td>0.58</td>
</tr>
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</table>

Sealed Double-Glazed Windows Available in 45 Standard Sizes

PICTURE WINDOW STANDARD SIZES—The 45 standard sizes below apply only to a construction of 2 pieces of 1/4" Polished Plate Glass with a 1/2" air space.

<table>
<thead>
<tr>
<th>Width</th>
<th>Height</th>
<th>Width</th>
<th>Height</th>
<th>Width</th>
<th>Height</th>
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<td>35 1/2&quot; x 36&quot;</td>
<td>48 1/2&quot; x 72&quot;</td>
<td>56 1/2&quot; x 70 1/2&quot;</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>35 1/2&quot; x 48 1/2&quot;</td>
<td>48 1/2&quot; x 55 1/2&quot;</td>
<td>58 1/2&quot; x 64 1/2&quot;</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>35 1/2&quot; x 60 1/2&quot;</td>
<td>48 1/2&quot; x 75 1/2&quot;</td>
<td>58 1/2&quot; x 72 1/2&quot;</td>
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<td></td>
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<tr>
<td>36 1/2&quot; x 55 1/2&quot;</td>
<td>48 1/2&quot; x 50 1/2&quot;</td>
<td>58 1/2&quot; x 80 1/2&quot;</td>
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<tr>
<td>36 1/2&quot; x 75 1/2&quot;</td>
<td>50 1/2&quot; x 55 1/2&quot;</td>
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<td>42 1/2&quot; x 66 1/2&quot;</td>
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<td>50 1/2&quot; x 96 1/2&quot;</td>
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<td>46 1/2&quot; x 52 1/2&quot;</td>
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<td>66 1/2&quot; x 72 1/2&quot;</td>
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<td>47 1/2&quot; x 66 1/2&quot;</td>
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<td>56 1/2&quot; x 58 1/2&quot;</td>
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<tr>
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<td>72 1/2&quot; x 96 1/2&quot;</td>
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</table>

Outside Temperature Required to Produce Condensation in Room Side Glass Surface

ROOM TEMPERATURE: 70°F
OUTSIDE WIND VELOCITY IS 15 MPH
ALL GLASS 1/4" THICK
WINDOW AIR SPACE 1/2"

Percent Relative Humidity

Light Reflection Values of Colors

<table>
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<tr>
<th>Color</th>
<th>Value</th>
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<tr>
<td>Black</td>
<td>2%</td>
</tr>
<tr>
<td>Pink, Shell</td>
<td>55%</td>
</tr>
<tr>
<td>Orchid</td>
<td>67%</td>
</tr>
<tr>
<td>Brown</td>
<td>16%</td>
</tr>
<tr>
<td>Green, Pale</td>
<td>59%</td>
</tr>
<tr>
<td>Caen Stone</td>
<td>76%</td>
</tr>
<tr>
<td>Green, Forest</td>
<td>22%</td>
</tr>
<tr>
<td>Buff</td>
<td>63%</td>
</tr>
<tr>
<td>Cream</td>
<td>77%</td>
</tr>
<tr>
<td>Tan, Olive</td>
<td>43%</td>
</tr>
<tr>
<td>Blue, Sky</td>
<td>65%</td>
</tr>
<tr>
<td>Yel, Canary</td>
<td>77%</td>
</tr>
<tr>
<td>Gray, Silver</td>
<td>46%</td>
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<tr>
<td>Tan, Ivory</td>
<td>66%</td>
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<tr>
<td>66%</td>
<td></td>
</tr>
<tr>
<td>Sage, Bright</td>
<td>52%</td>
</tr>
<tr>
<td>Gray, Cream</td>
<td>66%</td>
</tr>
<tr>
<td>White</td>
<td>89%</td>
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</table>
Layout Tables For Glass Block Panels

Using 3/8 inch mortar joints in face brick

These tables show masonry opening sizes required when shape of glass block panel and number of blocks to be inserted have been determined.

### 5 3/8" SQUARE BLOCKS 3/4" MORTAR JOINTS

<table>
<thead>
<tr>
<th>No. of Units</th>
<th>Panel Width or Height</th>
<th>Type &quot;A&quot;</th>
<th>Type &quot;B&quot;</th>
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<td>16 1/4&quot;</td>
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<td>7</td>
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<tr>
<td>10</td>
<td>30 3/8&quot;</td>
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### 7 3/8" SQUARE BLOCKS 3/4" MORTAR JOINTS

<table>
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<th>No. of Units</th>
<th>Panel Width or Height</th>
<th>Type &quot;A&quot;</th>
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<td>29 1/2&quot;</td>
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<td>25 1/2&quot;</td>
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<tr>
<td>10</td>
<td>32 3/4&quot;</td>
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### 7 1/4" SQUARE BLOCKS 3/4" MORTAR JOINTS

<table>
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### Dimensions for Five Types of Glass Block

#### BLOCK DIMENSIONS

<table>
<thead>
<tr>
<th>Type</th>
<th>Dimensions</th>
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<tbody>
<tr>
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<tr>
<td>B</td>
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</tr>
<tr>
<td>C</td>
<td>1 1/8&quot; x 1 1/8&quot;</td>
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<tr>
<td>D</td>
<td>1 1/8&quot; x 1 1/8&quot;</td>
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<tr>
<td>E</td>
<td>1 1/8&quot; x 1 1/8&quot;</td>
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</table>

#### Table Showing Radii Limits for Curved Glass Block Panels

<table>
<thead>
<tr>
<th>Outside of Block Radius in 90°</th>
<th>Joint Thickness in Inches</th>
<th>Remarks</th>
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<td>6&quot; SQUARE BLOCK</td>
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</tr>
<tr>
<td>60</td>
<td>15</td>
<td>Minimum</td>
</tr>
<tr>
<td>50</td>
<td>15</td>
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<tr>
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<td>15</td>
<td>Minimum</td>
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<tr>
<td>2&quot; RADIAL BLOCK</td>
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<td>Minimum</td>
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#### Details on Chase Construction

**Type "A"—CHASE CONSTRUCTION LIMITATIONS**

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<th>Panel Width</th>
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**Type "B"—WALL ANCHOR CONSTRUCTION LIMITATIONS**

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</tbody>
</table>

Pittsburgh Corning Data

430

**AMERICAN BUILDER**
Recommended Erection Techniques
For Glass Block Panels

Conventional Construction – Modular Coordination—
12-Inch Masonry Walls

Erection Procedure

STEP NO. 1
(PRELIMINARY PREPARATION)
FORM CHASE OF SIZE SHOWN — IN
MASONRY OR BY METAL SHAPES.
APPLY ASPHALT EMULSION TO SILL.
APPLY EXPANSION STRIP CONTINUOUSLY AT HEAD AND JAWS.

STEP NO. 2
(LEAVING INSULUX)
KEEP MORTAR OUT OF EXPANSION JOINT.
USE FULL HEAD AND BED JOINTS.
BED WALL TIE IN CENTER OF MORTAR JOINT.

STEP NO. 3
(BRACING PANEL AFTER MORTAR HAS SET)
BRACE PANELS TEMPORARILY WITH WOODEN WEDGES.
RAM OAKUM TIGHT IN SPACES AT SIDES OF BLOCK.

STEP NO. 4
(CLEANING AND CALKING)
REMOVE WOODEN WEDGES.
CLEAN PANEL.
CALK TO DEPTH OF 1/8 MINIMUM.

Use above in conjunction with typical details and specifications.

APRIL 1952
REVOLUTION IN BUILDING

Gypsum Sheathing replacing old style sheathing just as Gypsum Lath replaced old wood lath!

★ SAVES TIME. Gold Bond Gypsum Sheathing comes in one easy-to-handle size, 2' x 8'. Workman can place these in position in one-fourth the time required to handle four 6' x 8' wood boards. One man can do an average size small house in a single day!

★ SAVES LABOR AND NAILS. One panel of Gold Bond Gypsum Sheathing requires only 28 nails compared with 56 for wood sheathing covering the same area. This means 50% less time needed to drive half as many nails. Up to 60% fewer man hours than needed for wood sheathing.

★ LESS WASTE. No random lengths, no lap loss...each panel 2' x 8'. 1000 sq. ft. of Gold Bond Gypsum Sheathing covers 1000 sq. ft. of area.

★ PERMANENT FIRE PROTECTION. The gypsum center of Gold Bond gypsum Sheathing is fireproof. It can't burn.

★ GREATER STRUCTURAL STRENGTH. Rock-like panels of Gold Bond Gypsum Sheathing add greater structural strength to houses by actual test...they can't buckle, warp, contract, expand or twist.

Today when every nickel counts, Gold Bond Gypsum Sheathing is one sure answer to real savings for yourself and your customers, plus extra benefits for both of you. See your local Gold Bond Lumber and Building Materials Dealer today!

NATIONAL GYPSUM COMPANY
BUFFALO 2, NEW YORK

You'll build or remodel better with
Gold Bond
INSULATING boards made from wood fibers are waterproofed or otherwise treated with preservatives to make them resistant to moisture, rot, drastic changes in dimension, and fire. They combine insulation against heat and sound with structural strength and interior finish. They are a practical material for covering big areas quickly and economically. As a base for plaster, their insulating value is combined with high bonding strength.

Decorative insulating boards include sheets, plank and tile boards which are well standardized. Sheets are made in standard 4-foot widths, 8, 10, and 12 feet long. Plank is manufactured in 8, 10, 12, and 16-inch widths and lengths of 8, 10 and 12 feet. Tile is generally made in 12 by 12, 12 by 24, 16 by 16 and 16 by 32 inch sizes. They are prefinished in a variety of plain and colored surfaces and are as adaptable for remodeling and redecoration as for new construction.

Planks feature long edges which are beveled, with interlocking joints for which some manufacturers have also developed special clip systems for fastening to eliminate exposed nailing. Board plank may be put on either vertically or horizontally and in either uniform or random widths. When applied vertically, a single board will provide floor-to-ceiling coverage. Applied horizontally, one sheet will span up to 12 feet of wall area. When plank which varies in width is applied, furring strips must be at right angles to length of plank and preferably on 9- or 12-inch centers.

Sealing Joints

Either vertically or horizontally, there will be joints to be treated. The simplest joint treatment is to bevel board edges and bring butts into moderate contact. Joints are then concealed with cement and special tape. Paneling effects may be obtained by covering joints with hatten strips or moldings which may be of wood, metal or insulating board. Joints can be accentuated in other ways for unusual decorative effects. One method is to insert a wood molding between boards, or insert molding strips into joints; or an open joint can be achieved by leaving a space of about 3/4 inch between units and painting the space a contrasting color.

Installation

Ease of handling and speed of application have popularized insulating board. However, it is important that manufacturers' recommendations be followed as to specifications and procedures. When nails or clips are used, framing members or furring to which board is to be attached must conform to the size of the units used, in order
Attic has been insulated and crudely partitioned before contractor was called in.

to avoid use of extra materials. If the board is fastened with adhesives to continuous, solid, sound looking, there is no problem, but attention should be given to the kind of adhesive recommended by the manufacturer.

Where nails are exposed, 16-inch finishing nails or brads should be employed. Nails should be driven at an angle, set below surface, and loose fiber tapped over the surface. Where beads and grooves permit, nails can be driven there to make them less noticeable. If nails are to be covered by moldings or battens, 1/2-inch box, common or galvanized nails can be used with the regular 1/2-inch boards.

**GYPSUM BOARD**

There are three thicknesses of gypsum wallboard—1/8, 5/16, and 3/8 inch. The length varies from 4 to 12 feet. The 1/2-inch board is made with square edges only. It is a lower-priced product designed to serve specific purposes, such as (1) temporary repairs and alteration work; (2) as a covering over old wall surfaces, and (3) for ceiling repairs where light weight is needed.

The 3/8-inch standard gypsum board and 1/2-inch wall board is available with square, beveled and recessed edges.

Insulating gypsum wallboard is made with all types of edges and thicknesses. Aluminum foil is firmly attached to the back surface of this board to provide reflective insulation and act as a vapor barrier.

Gypsum tile board is made in 3/8-inch thickness only, and from 6 to 12-foot lengths. These boards have a square edge and an ivory surface but with tile indentations 1/2 inches square.

Wood-grained gypsum board is made in 3/8-inch thickness and from 6 to 12-foot lengths. Edges are square or beveled. A paper having a photographic reproduction of knotty pine, bleached or ribbon mahogany, walnut, or figured aspen is used.

**Preparing the Framework**

Gypsum wallboard, like any other wall or ceiling finish, requires level and true framework. The wood supports should be properly spaced and leveled in a workmanlike manner. Faces of studs should be lined up with the face of plates at top and bottom. Studs and joists should not exceed 16 inches on centers, except that their spacing may be increased to 24 inches when 1/2-inch wallboard is used. Substantial nailing surfaces should be supplied at all interior and exterior corners so that the ends of boards forming the corners may be securely nailed.

Window and door frames should be ordered for 3/8 or 5/8-inch grounds, depending upon the wallboard used.

**Double Wall System**

The gypsum double wallboard system calls for two layers of gypsum wallboard, each 1/8-inch thick. The base layer is nailed vertically to the studs, and the face layer is applied horizontally over the base layer with.
Gypsum wallboard, easily cut to fit around windows and into odd shapes under eaves. Converted barren attic into attractive apartment. Wallboard takes casein or oil-base paint, wallpaper or other decorative materials.

Wallboard fits well into odd-shaped wall or ceiling areas; stands up when used around coves and for valances.

Second stage in double-wall construction: nailing is done with wallboard in horizontal application as finish layer. Omitting, they can be subsequently countersunk. The ceiling is applied first. The first, finish layers are attached to the upper section of the sidewalls in a horizontal position. The facing layer is nailed here also to afford temporary fixation until the cement sets.

After the face layer has been in place long enough for setting and drying of the adhesive, usually about 24 hours, all temporary nails in the face layer are countersunk, unless they were dimpled when originally driven.

The horizontal application of the face layers to the walls makes for fewer joints, and less ladder climbing or scaffold erecting. The "cross application" of the face and base layers of the gypsum wallboard add strength to the wall, which, with the two layers of 1/8-inch wallboard, is 3/4-inch thick.

Nailing is Important

Proper nailing for single and double-wallboard application is highly important to achieve maximum strength and durability of the wall. Use only 5-penny cement-coated nails 1-1/2 inches long (13 ga., 1/2 head). Start nailing at center of the board and work outward, spacing nails 5 to 7 inches apart, but not closer than 3/4-inch to edges or ends of board.

Area of the board immediately surrounding each nail must be held tightly against the framing while the nail is being driven. A crown headed hammer should be used. Each nail should be driven until the head rests in a slight depression in the board so the head can be concealed by cement. Surface of the paper must not be broken by the nailhead or hammer.

Concealing the Joints

Gypsum wallboard joints can be so effectively concealed that it is im-

April 1952
HOW TO CONCEAL CRACKS AND NAIL HOLES

1. Apply cement to channel of joint
2. Reinforcing tape is embedded in cement, and excess cement removed. Tape is covered with cement
3. Second coat of cement applied over tape and edges is feathered out evenly
4. Nail holes are first "dimpled" gently so as not to break surface of the board. Dimples are then filled with cement
5. Sandpaper surface lightly after cement has dried to remove any rough spots
6. Corner joints are finished similarly to flat-wall joints. Tape is creased down the middle before applying
7. Tape is folded over corner and cemented as in flat-wall joints to cover outside corners
8. Outside angles of curves are tapered with tape cut as shown to allow for bend. Board is scored on back to follow curve
9. Each board must be tight against furring before concealing nail heads. Care must be taken to avoid breaking surface of board when nailing or dimpling

possible to see them once the walls are decorated. In concealing a joint, a special cement is first applied (see illustrations). Only joint cement recommended by the gypsum manufacturer should be used. This is mixed to a putty-like consistency. It is applied by a broad knife into the channel formed by recessed edges of adjoining boards. Moderate pressure is used, making sure that the channel is filled evenly.

A perforated reinforcing tape is then applied over the cement to the full length of each joint. Tape is imbedded in the cement. Excess cement is removed, then the tape is covered with a thin layer. At this time, all nailheads should be concealed by "spotting" with cement.

A second coat of cement is applied over the joint area, and feathered out as far as necessary to obtain a smooth, even surface. Cement is applied to end joints in this manner, but feathered out a few inches farther than recessed joints. A third coat is recommended and the surface should be left as smooth as possible.

Before concealing nailheads, it should be made certain that each board is tight against the framing and will not move on shanks of the nails. Depressions should be filled surrounding the nailheads, with the first coat of cement. After drying, a second coat is applied. For better concealment, a third coat is recommended, left as smooth as possible.
If necessary, the last coat can be sanded lightly with fine sandpaper. There is little difference between finishing corners (both inside and outside) and flat wall joints. The exception is that the tape is folded lengthwise down the center to fit the corner. These joints are also treated with at least three coats of cement, feathered out and left as smooth as possible.

**Special Problems**

Gypsum wallboard is quickly made to conform to curved surfaces. It is done by scoring the back paper of the board at intervals and breaking the core beneath each cut. The board is then nailed to the curved contour and corners are treated with the reinforcing system described previously, except that the tape is snapped at intervals along one side and applied so that it conforms to the arch. Gypsum wallboard may be painted, calceined or wallpapered. A varnish size should be applied to the surface of the board before papering or applying calceine. This size will permit ready removal of paper or calceine when redecorating. A primer should be applied to the surface of the board when paint is used.

**ASBESTOS-CEMENT FLAT BOARDS**

An attractive stone gray in color, asbestos boards are hard and smooth on one side and slightly textured on the other. They are a practical material for structural wallboard use and are highly serviceable for exterior surfaces as well as interior walls.

Made in sheets 1/2 to 5/8-inches thick, four feet wide and eight feet long, the boards are light enough to be handled easily. Nailing is the usual method of application, although they can be put on with a special adhesive, supplemented by nails, moldings or other overlapping devices. As an alternate to nails, wood screws may be used.

The boards may be cut by sawing, shearing, or by scoring and breaking. Special cutting jigs also are available. When cutting, the finish side is placed up so that any roughness will be on the underside. A carpenter's key point saw with little set will cut satisfactorily. Mechanical saws with abrasive blades also are used effectively.

**Scoring and Breaking Boards**

Scoring and breaking is one of the simplest ways to cut the thinner boards. The sheet is scored against a straight edge, deeply on both sides, with a tool such as a knife, ice pick or awl. A scoring tool can be made from a 12 to 14-inch flat smooth file set into a heavy wooden handle. Shape it like a wood chisel, then "relieve" the back of the point by grinding the long face edge of the file at about 30 degrees so that a face about 3/8 inch wide is produced across the back of the cutting edge. Improvised "C" clamps hold the sheet in place on a cutting table while it is snapped across the scored line.

All 3/4-inch thick boards may be nailed directly. Other thicknesses may require driving or punching of holes to receive nails. Manufacturers vary in their recommendations as to the maximum thicknesses that can be nailed directly. Nails are driven in straight, snug against the board, but are not sunk into the surfaces. Nailing recommendations vary somewhat with different makes of boards and manufacturers' instructions should be obtained on that point. The same applies to spacing of nails away from the edges. Nails first are driven near the starting edges of the sheets, working toward the opposite edges.

**Barbed Nails Recommended**

Barbed or ring-shanked nails having sharp needle points are recommended. They should be long enough to penetrate well into good sound wood. For inconspicuous interior work, small countersunk head nails may be used. For ordinary interior work, and for nailing against wood sheathing or studding, use a hot dipped galvanized asbestos shingle nail. Galvanized lead-headed nails are employed for exterior work. Large headed nails should be used for ceiling work.

Any punch used for steel or metal work having a female die and male punching bit will work with asbestos-cement sheets provided the “hold-down” is not tight. Cold or drift punches that do not taper at the end are satisfactory. Holes also can be drilled with standard twist bits in hand or electrical drills. The holes are formed slightly larger (3/8 inch) than the nail or screw to allow for expansion, except when using countersunk fasteners, in which case the hole is countersunk slightly smaller than the head of the fastener to assure a neat, tight job.

**Painting**

For interior work, painting systems which are suitable for application over plaster walls are satisfactory, but call for a special primer. The primer should be applied according to the paint manufacturer’s directions.

**WALLBOARD AND TILE**

Wallboard and ceiling tile made of layers of wood or fiber or paper bonded with resins are available. Wallboard panels are waterproofed and measure up to 8 feet wide and 18 feet long. Panels 3/8-inch thick with p ebbled surface are ideal for either painting or papering.

Dry-built, full-wall construction is economical with the use of these laminated fiber panels, waterproofed and with strong insulation value. The wall panels come in standard sizes 4 feet wide by 6, 8, 10, 12 and 16 feet long, and full-wall sizes 8 feet by 12, 14, 16, and 18 feet long. Surfaces are presized to provide a perfect painting surface. Ceiling tiles of similar material are cut to 12-inch squares, with edges moderately beveled. Manufacturers claim they are so completely waterproofed that they can withstand even unusual moisture conditions. Their natural finish is decorative, washable, and will take oil-base paints.

**Installation Procedures**

This type of board has its own “floating” fastener which makes face nailing unnecessary and eliminates visible nails and nail holes. It is applied by nailing it to the ceiling or wall. The nails are driven in with a hammer, then the fasteners are applied. The fasteners are then driven with a hammer, followed by the application of cement to the back of the tile. The tile is then applied to the ceiling, starting at the center with temporary straight-edge nailed up for a guide.
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..cut the dead load
ceilings like these!

Save man-hours, expedite the job! Whether your next ceiling job is new construction, remodeling or repair, Insulite tileboard can save you important time! Insulite, you see, goes up quickly and easily in just one simple operation...goes up in a fraction of the time required for heavy plaster ceilings!

Reduce dead load, save steel! With present limitations on the use of steel, dead load can often mean the difference between a new building and no building at all. Lightweight Insulite tileboards cut your dead load to the bone...often eliminate the need for steel beams entirely!

For complete facts on the complete line of Insulite ceiling and acoustical tileboards, contact your Insulite dealer, or drop us a card today!

Pictured at left: Insulite Lusterlite Tileboard, available in both square and rectangular shapes with a smooth, durable factory-painted finish. Easy to clean or repaint. Has high light-reflectance. Goes on quickly, easily and securely with staples, nails or adhesive.

For low-cost acoustical treatment, ask your dealer for Fiberlite. It's a double-duty acoustical tileboard that insulates as it hushes sound! Has a rich, travertine texture and adds beauty to any interior. Made from tough, natural wood fibers. Easy to clean. Can be repainted.

Want a perforated tileboard? Get Acoustilite from your Insulite dealer. This new perforated tileboard is available with Insulite's heavy-duty flanged tongue-and-groove joint for application over hurring strips or the butt-edge joint for adhesive application. Both are extra-easy to apply, clean and repaint!

Build and insulate with double-duty Insulite

Made of hardy Northern wood

INSULITE DIVISION MINNESOTA AND ONTARIO PAPER COMPANY, MINNEAPOLIS 2, MINNESOTA
Common Patterns Used in Application of Ceiling Tile

CEILING PATTERNS: This design utilizes units 12x12 inches and 12x24 inches or 16x16 inches and 16x32 inches. This simple square pattern is easy to apply with either 12x12-inch or 16x16-inch tileboards for a trim effect. Here square and rectangular units are combined. Large units are best for big area installations. This loose basket weave pattern results from combining squares and rectangles in manner shown.

HERE 12x12-inch or 16x16-inch units are applied diagonally to achieve an attractive diamond pattern especially good for large rooms. Ashlar patterns may be obtained by the staggering of joints. In this pattern squares and rectangles are alternated. Suitable for uniform or varied colored ceilings. A variation of the basket weave pattern, this design is most effective when used in large interiors.

(Continued from page 437)

Applied directly to studs or furring, wall panels are fastened securely from the back. The fastener is so constructed as to permit movement of the panel, due to normal structural settlement, both vertically and horizontally.

These wall panels are easy to handle; even a large 8 by 18-foot panel can be handled by two men using wooden “U” clamps. Panels come with vapor barrier applied if desired. Moldings for cornice, panel, inside corner and outside corner are also furnished by the manufacturer and are commonly stocked by lumber dealers; when used, panels should be painted before moldings are installed.

Decorative Wallboards

Also available are 7-ply laminated fiber panels in stratified design, guaranteed to be permanently crackproof and possessing effective insulating qualities. They are compressed to ½-inch thickness, and are available in sizes 4 by 8 feet or on special order in larger sizes. They are applied directly to studs with the same type of fasteners previously mentioned. For baths and kitchens a pre-finished fiber board is available in giant size panels 8 feet wide by 12 feet long, as well as standard 4 by 8-foot size with the glossy tile-like surface embossed in various colors in squares.

One manufacturer offers a wallboard which comes in a rich simulated leather finish closely resembling fine split cowhide, which is recommended for wainscoting, decorative panels or over-all wall treatments. Panels are 8 feet long in 3-foot and 4-foot widths, available in colors and textured designs. No further treatment is required after installing.

Board, tile board, finish plank, and beveled interior board are also available in new colors and a variety of textures and sizes which do not require painting or papering and can be put up with nails or staples.

Decorative Tile and Tileboard

Decorative tileboard is used almost exclusively on ceilings. These boards have interlocking tongue-and-groove joints with extra-wide nailing flange so that adjoining units fit together firmly and smoothly, and allow concealed fastening. They can be applied with stapling gun, without use of special clips. Many attractive patterns may be worked out with ceiling tile, used with or without color variations and combinations. Intricate patterns, however, require extra care in installation. They start from the center of the ceiling, and care must be taken to insure adequate furring where tiles of varying sizes and shapes are used.

Acutual Materials

Perforated acoustical fiberboard tile are particularly desirable because of their comparatively low cost and ease of maintenance. Most are factory painted and require no finishing treatment on the job but may be painted without losing acoustical qualities. The beveled units may be cemented to plaster, concrete, plasterboard ceilings, or mechanically fastened to wood furring or directly to plasterboard. The manufacturer provides a special self-clinching nail for attaching directly to plasterboard.

Other acoustical units consist of panels with perforated asbestos cement facing ½ inch thick, used in conjunction with sound-absorbing elements. Popular sizes are 24 by 24 inches and facing is installed with square edges and butt joints which minimize or eliminate all tile lines.

Glass Fiber Tile

Acoustical boards and tile made of glass fiber are well-suited to suspended ceiling constructions because of their low weight and dimensionally stable characteristics. Standard acoustical adhesives may be used. However, they are not recommended for use on surfaces which are subject to frequent condensation or under conditions where the tiles will remain wet, as water-staining may result.

American Builder
HOW TO USE CLIPS IN THE APPLICATION OF CEILING TILE BOARD AND PLANKS

Application of T & G TileBoard and Plank

1. Insulite Clip, double pronged. Slot for adjustable nailing.

2. First, insert clip by sliding prong along lower surface of tongue of Unit A as indicated.

3. Push the prong into the board until the clip is firmly against the edge of the joint and using a 2d (1°) box nail, secure clip and board in desired position. Drive nail flush with clip.

4. Now, slide Unit B onto the protruding prong of the clip. Keep prong flush with lower lip of groove.

5. Bring units together gently so that the tongue of Unit A is properly seated in groove of Unit B.

6. In working from the groove side of tileboard, the clip is first inserted into the groove with the nailing slot extending outward.

Application of Lok-Grip Joint TileBoard and Plank

1. Nail through nailing range of first unit (Fig. 1).
2. Start Lok-Pins just below tip of tongue of second unit (Fig. 2).
3. Push Lok-Pins half way into tileboard and at a slight angle with the surface (Fig. 3).
4. Place this second unit so that Lok-Pins enter groove behind nailing range of first unit (Fig. 4).
5. Firmly press second unit into position, engaging the interlocking joint and firmly anchoring Lok-Pins into both units (Fig. 5).
6. Secure opposite edge of second unit by nailing through Range.
7. Continue in same manner with succeeding units.

Common sizes in glass fiber tile are 12 by 12 by 3/16-inch and 1-inch beveled; 12 by 24 by 3/16-inch and 1-inch beveled, and cross-grooved to simulate 12 by 12-inch; and bevels of 3/8-inch. Either plain or perforated types are available. Both are factory decorated with a white water-base paint and may be repainted with water-base paint, although oil-base paint is recommended if repeated washing is necessary.

The glass fiber board is manufactured in four sizes: 25% by 48 by 1-inch beveled, cross-grooved to represent 12 by 12-inch; 24 by 48 by 1-inch beveled, cross-grooved to represent 12 by 12-inch; 24 by 37% by 1-inch beveled on two length edges, cross-grooved at 12-inch intervals

(Continued on page 445)
Exclusive TONGUE AND GROOVE Nu-Wood Tile for Clip Application!

A Nu-Wood exclusive—the Nu-Wood Clip System that assures beautiful wall and ceiling surfaces for years to come. The clips are reversible, fitting either the tongue or groove joint of tile. "Center of ceiling" starting is made possible with the Nu-Wood Clip System, for easier and fool-proof application.

Complete wrap-around support—the Nu-Wood Clip completely "wraps" tile tongue and groove edges with metal—supporting both tiles. Thus, ceiling tiles stay in place when applied with Nu-Wood Clips, assuring a level surface.

Self-aligning—the Nu-Wood Clip invisible nailing "floats" the tile in perfect alignment, compensating for slight irregularities in the nailing surface. Also, minor adjustments in tiles may be made to true up joint lines, even after clip is fastened in place.

Tighter joints with Nu-Wood Clips—surfaces stay cleaner because air movement through tile joints is reduced, thus minimizing collection of surface dirt. Insulation value of tile is improved because of tongue and groove joint.

New WIDE FLANGE Nu-Wood Tile for Staple Application!

Sturdy, thicker flange for better staple application—staples hold securely with less chance for "pull through" in the Nu-Wood Wide Flange Tile.

Nu-Wood Wide Flange Tile is available with the famous Sta-Lite light-reflecting surface, which actually grows lighter with age... reflecting 76% of light directed to surface without harsh glare.

Shadow-Line Bevel—just as with Nu-Wood Tongue and Groove Tile, the Wide Flange Tile has the distinctive Shadow-Line Bevel... providing "pencil-thin" jointings, preferred for beauty.
No other manufacturer offers you this
Complete line of insulation board products

A superior interior finish line—including
tile, plank, board and Lok-Panel; also in
thin board. Predecorated—Sta-Lite, Kolor-
Fast or Variegated finishes provide special
wall and ceiling decorative effects.

Famous Nu-Wood Shadow-Line Bevel gives
"pencil line" joint lines to suit the modern
trend toward simplicity in interior decora-
tion. Elimination of bead on Nu-Wood Plank
also gives modern, streamlined appearance.

Nu-Wood sturdy structural insulation board products

Supplementing the Nu-Wood interior finish line is a com-
plete line of Nu-Wood structural products, including extra
strong Nu-Wood impregnated insulating sheathing, Nu-Wood
insulating lath, Nu-Wood roof insulation, Nu-Wood shingle
underliner and Arrowhead board.

Plus Nu-Wood acoustical tile

Provides modern sound correction—better looking application because
of the famous Nu-Wood Tongue and Groove Joint and Clip System
application for self-aligning tiles. Distinctive Shadow-Line Bevel for
new beauty.

Nu-Wood Insulating Sheathing
—exceptionally strong nail-holding
sheathing impregnated with asphalt
waterproofing agent for maximum
weather protection. 25/32" and
1/2" thicknesses.

Nu-Wood Insulating Lath—easy-
to-handle units—V-type tongue and
groove joints provide interlocking
long edges—square cut ends—low
thermal conductivity for maximum
insulation.

Nu-Wood Shadow-line Board—
distinctive, pencil-thin shadow-line
bevel, at no extra cost, eliminates
need for batten strips or other
special joint treatments—provides
pleasing wall appearance.

Nu-Wood Shingle Underliner—
provides popular deep shadow lines
when used as first course—gives
added insulation when shingles are
applied—cushions shingle nailing
shock—saves time, eliminates waste.

Arrowhead Board—a utility-grade
insulation board fulfills a multitude
of uses—predecorated for low-cost
interior finish for farm buildings,
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Makers of Nu-Wood Insulation Board Products
and Balsam-Wool Sealed Insulation
Sold by Lumber Dealers only
CEILING TILE BOARD INSTALLATION DETAIL

Cement application over furring. When the base surface (masonry, rough plaster, rough concrete, or open joists) does not provide a satisfactory base for cement application, a recommended method is to install 1x3-inch cross furring, 12 inches on center and cover with gypsum board or lath. This provides a sound base for cementing.

Mechanical installation of acoustical tile. There are several mechanical suspension systems which can be used for application of acoustical tile. The diagram above shows one recommended method. Metal carrying channels and furring strips support a surface of gypsum sheathing. Ceiling tile is screwed to this surface.

Application of acoustical tile to wood furring by nails or screws. By the use of cross furring 12 inches on center, acoustical tile may be applied by nailing or screwing, in spite of an unsatisfactory base surface. When this method is used it is important to cover the furring with a layer of building paper to prevent "breathing" at the joints.

Mechanical suspension of ceiling tile. The metal T-runners, to which the ceiling tile metal pans are clamped, may be nailed or screwed directly to wood, or suspended from metal hanger angles, as shown above at left. Another method, shown at right, calls for wire suspension of channels, to which T-runners are clipped 24 inches o.c.
(Continued from page 441)

-47-inch from selvage on width; and
24 by 36 by 1-inch beveled on all four
edges. Boards will span 24 inches
without sag and without cross sup-
port. Longer spans need stiffening
with simple members inserted into the
long edges of the board during ap-
lication.

Mineral Fiber Tile

Another type of acoustical tile is
made from mineral fibers. It is de-
signed in both a marble pattern and
etched surface. The various methods
of installation with adhesives, me-
chanical erection, or nailing direct to
wood strips according to manufact-
urers' specific recommendations all
have advantages depending upon the
specific type of construction, but ad-
hesive application is the most widely
used method and is recommended
where a suitable base exists.

MECHANICAL
SUSPENSION METHODS

Cold-rolled, 16-gauge steel chan-
nels are wired in some installations
to furring channels for suspended
ceilings or fastened directly to ceiling
or wall construction for directly ap-
plied acoustical finish. Channels are
set at approximately the center line
of the ceiling tiles, eliminating the
lining-up with the joints. Combina-
tion "clip-snap-on" metal acoustical
wall trim composed of extruded alu-
mum or rolled gal-

AMIDALL
DECORATIVE PLASTIC LAMINATE

BECAUSE IT APPLIES SO EASILY: So easy to put up right-on-the-job
because of its unusual structural strength and rigidity. Large, easy-to-handle
panels of ½" thickness are quick and simple to cement to walls and top surfaces with
adhesive...can be cut, trimmed and shaped with ordinary carpenter tools.

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strength plus economy, you'll want to use
Lamidall...and you can in hundreds of
applications for institutional, commercial and
residential building.

MATCHING MOULDINGS! Easy-to-use,
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possible the greater beauty of continuous
wall decoration.

PERFECT FOR TOP SURFACES! Lamidall
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PARTITION SYSTEMS

Of particular interest to the builder who has occasion to erect small offices or light commercial and industrial structures, office partition systems are available in various combinations of wood and steel, pre-finished boards, insulating boards and other combination materials.

Steel and Glass Panels

Several types of steel and glass panels are available, most of which offer interchangeable panel and door sections, universal doors, reversible hardware, identical fittings between panels and linking panels to posts, and other conveniences of erection. Provision is made within the panels for wiring and similar facilities. Installation is by simple channels set in floor and ceiling, with the panel fastened quickly in place; removing it to another location at a later date is easily accomplished.

Movable Asbestos Walls

Asbestos panels which are integrally colored at the factory are now available for industrial and commercial office installations where light weight and fireproof qualities are important. The panels may be installed in either vertical or horizontal position for design effects. They look and function like permanent walls, but are easily taken down and reassembled.

Parts are hung on standard steel studs to form a rigid double-faced 4-inch thick partition having great strength and rigidity. For schools, blackboards and chalk rails can be incorporated as part of the partition, and panels are equally useful in laboratory installations. Steel studs which carry the panels are set at top and bottom in steel channel which is fastened to floor and ceiling, easily removed and relocated.

Insulating Board Partitions

Partitions are also made of laminated cane fiber insulation board, surfaced on both sides with asbestos cement board and bonded with a moisture-proof highly vapor-resistant bituminous adhesive. Result is a strong, insulating, and maintenance-free exterior and interior finish in a single-thickness material. These panels are used in industrial and commercial buildings as partition walls, as well as in home construction.

Readily workable with regular
carpenter tools. Panels may be sawed, drilled and nailed. Partitions are available in three types: (1) splined non-bearing partition grooved on long edges to receive a 3/16-inch by 1/4-inch wood spline. This type of construction eliminates need of framing members or battens at the joints. (2) Load-bearing partition—panels are framed between 2 by 4 or 4 by 4 inch studs set approximately 4 feet 2 inches on center and held in place with wood stops nailed to studs around all edges on both sides of panels. Stubs are tied together by a suitable top plate of proper size to carry required loading. (3) Battened non-bearing partitions are similar to splined non-bearing partitions except that the spline is omitted and 1 by 3 inch or heavier wood battens or equivalent metal battens are placed on opposite sides of all vertical joints and fastened together by nailing or bolting through batten on one side and through panel into batten on other side. Top and bottom plates are rabbeted to receive panels and batten stop at plates.

Research Proves Value of Thin Wall Closets

Closets, designed with full-access fronts and engineered so they can be built with studless walls, were recommended by the Small Homes Council to the assembled builders and contractors that attended the seventh annual short course in residential construction, conducted recently at the University of Illinois. The design of the closets was the result of a

(Continued on page 448)
year-long study made under a research grant given to the University by the Lumber Dealers Research Council.

These closet-walls are for the type of house where the loads are placed on the exterior walls through roof trusses or other methods of framing, thus relieving the interior partitions of all structural weight. It was pointed out that closets as generally built today are "over engineered" and expensive. They occupy more floor area than necessary, and often result in inefficient storage space, much of which is inaccessible. The conventional door-in-a-wall closet limits the access to the closet because the side and the space near the ceiling are blocked by the jamb and head of the door. Due to these restrictions much space is either wasted or is difficult to reach.

The recommended closet-wall construction presented by Professor Kapple of the Small Homes Council, utilizes the principle of "three-way stiffening." The closet shelf becomes a structural element and also serves to divide the closet into two compartments—the lower one six feet high, the upper one two feet high.

"The closet," Professor Kapple said in explaining this construction, "can be considered as a series of small compartments. We all know how a box can be made very stiff with rather light construction because of the 'three-way stiffening.' In this closet we achieved 'three-way stiffening' by making a structural element out of the closet shelf.

"Hence, we have the shelf, the divider partition or side wall of the closet, and the back wall all fastened together so as to stiffen each other. When we consider this form of stiffening, it becomes possible to use much lighter panels for the back wall and dividers in the closet. This new concept of closet construction makes it possible to use studless walls."

Three types of "thin-wall" panels which equalled or exceeded the performance of stud walls were developed. These survived impact and load tests to which more than 20 types of panels were subjected. The "thin-walls" are made of two pieces of wallboard, laminated.

The dimensions for the single closet, 4x2x8 feet, are based on the principle of modular design—that is, the dimensions are related to those of building material so that materials can be used with a minimum of cutting and fitting. The back walls, for example, can be built from whole 4x8 foot sheets of wallboard; the panels between double or triple closets from half sheets.
WHEN FINISH FLOORING 1/2 by 2-inch or 1/2 by 1 1/2-inch is used, 6d bright wire casing nails are best—one nail every 10 inches. Flooring 3/8-inch thick takes 4d nails spaced 8 inches apart.

ALL types of flooring materials fall under one of three general categories: wood floors, resilient floors, or non-resilient floors. The majority of wood floors are made from woods botanically classed as hardwoods. Several excellent flooring woods fall into the classification of softwoods, but are from the harder species. For reference purposes, composition flooring materials are considered resilient flooring while those floors composed of concrete and stone products make up the non-resilient category.

Medium and light duty hardwood floors are used in business offices, hospitals, institutions and residences; structures where less rigorous wear is to be expected. Today there are three basic types of wood flooring: Strip, parquet or pattern, and plank. Reference is sometimes made to a type of block flooring. This is simply flooring blocks, pre-assembled at the factory, for parquet installation.

Five species of wood make up the vast majority of all types of floors: oak, maple, birch, beech and pecan. Other species used, which are limited because of economy and scarcity reasons, are hickory, teak, cherry, ash and walnut. The last mentioned species are also very durable and their grain patterns afford outstanding and distinctive floors. Generally, only wood flooring producers specializing in these distinctive species make an attempt to classify and grade their output.

Flooring Types

Strip flooring consists of pieces, available in varying thicknesses, cut in narrow strips and of uniform widths. Pieces are tongued and grooved at the factory.

Parquet or pattern flooring consists of equal short lengths, generally governed by multiples of the width, which is installed in geometric patterns such as herringbone, squares, and rectangles. A parquetry flooring is also available which consists of factory assembled blocks; sometimes referred to as block flooring.

Plank flooring consists of boards milled in random widths to produce the effect of early American heavy plank floors. Plank flooring is available with or without beveled edges; beveled edges being used when a more authentic early hand-hewn treatment is wanted. The Colonial wood peg fastening effect is simulated by wood plugs glued in holes on top of the counter sink screws which fasten the planks.

Standard sizes, counts and weight charts are shown elsewhere on these pages.

Pre-Finished Hardwood Flooring

Some manufacturers produce flooring which is completely pre-finished at the factory. It is ready for use immediately after being laid. All species and types of hardwood flooring may not be readily available in this form; however, a producer equipped to make factory finished flooring can usually furnish it in any species and type he ordinarily produces unfinished.

Delivery and Storage Care

Factory kiln-dried hardwood flooring has a moisture content of five to
PARQUET FLOORING may be nailed to a wood subfloor or an old finish floor in the same manner as strip flooring. Proper construction of the subfloor is essential. Floor joists must be on 16-inch centers and covered solid with 25/32 by 4-inch or 6-inch subflooring thoroughly dried and nailed securely. The surface must be even-bearing.

Strip Floor Application

When possible lay strip floors lengthwise of the building. When applying over old finish floors, apply at right angles with the old floors. Thresholds are omitted in the modern home. Flooring should run continuously through doorways. Care should be exercised to stagger end joints to avoid grouping them closely together.

On Joists and Concrete

If necessary for economy measures, strip flooring may be laid directly on joists. Such floor strips should be at least 25/32-inch thick. Joists should be spaced no wider than 16 inches on center.

Strip floors may be installed over basement or other concrete floors by laying the strips directly on wooden sleepers properly secured to the concrete. Conditions cited in the previous paragraph apply.

In cases where strip flooring is to be laid over concrete and heavy traffic is anticipated, a wooden subfloor often is recommended as a base. The subfloor should be nailed to wooden sleepers installed in the concrete. Spaced at no more than 16 inches, the sleepers should be securely attached to the concrete.

Subfloor Requirements

Hardwood strip flooring should be laid on a soundly constructed subfloor. Subfloor boards should be between six and eight inches wide. Face nail them solidly at every bearing point with two or three 10-penny nails. All butt joints should rest on bearings. Use adequate nailing to avoid squeaky floors. Subfloors laid diagonally afford additional bracing strength for the building. Bracing strength will be further improved if diagonal direction is reversed on alternate floors. Before laying finish flooring, be sure subflooring is dry and clean, with all bits of plaster or other dirt scraped off.

six per cent. Care must go into handling and storing of flooring to help maintain this low moisture content. It should not be unloaded, trucked or transferred in rain or snow and must be covered with tarpaulin if the atmosphere is foggy or damp. Storage areas in colder climates in cold weather should be heated and maintained at 10 degrees above the outside temperature. Good ventilation is a must. Storage floors should be 18 inches or more above the ground. Store flooring on the job only after plaster and cement work have thoroughly dried. During winter construction keep building heated to 70 degrees and leave flooring piled loosely four or five days before laying.
He knew what he wanted ... BUT HOW TO ACHIEVE IT?

... and so, too, with your clients when they place their problem in your hands. They depend on YOU — on your experience and knowledge to take advantage of specific material and methods to achieve the end result they have in mind.

For that reason, you'll want to know about Flexi-Flor and Wall-Flex, so that you can make use of these new RUBBER materials to your best advantage and to the complete satisfaction of your client.

You have many specifications where the cushion resilience, the exceptional color and design range, the low maintenance and lifetime durability of Flexi-Flor and Wall-Flex can make an installation outstanding. We'd like to be sure you have all the details on R.C.A. — the only line for COMPLETE rubber installations.

WALL-FLEX
walls of rubber. New — exclusive — flexible ½" gauge fabric-back rubber in 28 colors. Simple, quick, one-man installation with the advantages of continuous corners and curved surfaces, sanitation, low maintenance and economy. You'll want to include the versatility and colorful beauty of Wall-Flex in your plans.

FLEXI-FLOR
Tough rubber. Available in 28 colors, in public form, ½", ⅞" and 1" thickness. Complete range of uses in addition to floors — counter tops, display tables, bulletin boards, desk tops, revenue booths, etc.

ACCESSORIES
Design-planned to complete the ensemble feature strips — borders — face — corners — and tread strips in the same 28 colors, stair treads for residential and commercial use — all of the same dependable R.C.A. rubber. Everything you need for complete planning.

He knew what he wanted ... BUT HOW TO ACHIEVE IT?
Preventing Dampness

A good quality building paper, such as 15 pound asphalt saturated felt, should be laid between the subfloor and the finish floor. Besides resisting moisture, the building paper prevents dust from seeping through the floor seams. In basement installations the building paper should also be used. It is advisable to place double weight building paper or standard insulating board in rooms directly over heating plants. Apply either on the basement ceiling or between floor joists to provide protection against heat which might cause the floor to shrink excessively.

Moisture should be provided beneath buildings without basements. Vents or openings in the foundation walls should be at least 1/4 per cent of the first floor area.

At least 1/2-inch expansion space should be allowed between flooring and framing.

Nails and Nailing

The use of proper nails (see Nail Schedule) and care in nailing holds the flooring in place, makes the floor rigid, and prevents squeaks. Start the nails through the strip where the tongue leaves the shoulder and drive inwardly at an angle of 45 to 55 degrees to the floor. Countersink all nail heads by use of a steel set or use a nail for setting.

Do not try to hammer each piece of tongue and grooved strip flooring into its final position as soon as it is nailed. After laying three or four pieces, place a short piece of straight-edge hardwood against the tongue of the outside piece and drive the pieces up snugly, taking care not to break the tongue. Repeat this after every three or four pieces have been laid.

Parquet Flooring

Parquet flooring, including prefabricated blocks, may be nailed over a wood subfloor or old finish floor, or may be laid in mastic over concrete. The subfloor should cross the joists at right angles rather than on a diagonal.

Parquetry Over Concrete

When parquetry is to be laid in mastic directly over concrete, extreme care must be taken that the concrete surface is perfectly clean, dry and level. Brushing the surface with a hair broom is recommended for ridding the concrete of loose dirt. A heavy coat of asphalt primer should then be applied evenly, brushed in well, and allowed to dry for 24 hours before the mastic is applied and the finish floor laid. Mastic usually is spread to a minimum average thickness of 3/16-inch.

When parquetry is to be laid over concrete directly on the ground or over unventilated spaces and there is a consequent danger of floor dampness, the concrete floor should be waterproofed. This may be done by applying a coat of hot asphalt and covering it with asphalt rolled smoothly on each layer. If there is danger of water seepage, use five layers.

Finishing Suggestions

Unfinished hardwood flooring is smoothly surfaced at the factory.

### STANDARD SIZES, COUNTS and WEIGHTS

Nominal is the size designation used by the trade, but it is not always the actual size. Sometimes the actual thickness of hardwood flooring is 1/32 inch less than the so-called nominal size. Actual is the mill size for thickness and face width, excluding tongue and groove. Counted size determines the board less in a shipment. Pieces less than 1 inch in thickness are considered to be 1 inch.

#### OAK

<table>
<thead>
<tr>
<th>Nominal</th>
<th>Actual</th>
<th>Counted</th>
<th>Weights M Ft</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 1/8 in.</td>
<td>1 1/4 in.</td>
<td>1 3/4 in.</td>
<td>2500 lbs</td>
</tr>
<tr>
<td>1 1/4 in.</td>
<td>1 3/4 in.</td>
<td>2 x 4 in.</td>
<td>2250 lbs</td>
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<td>1 1/2 in.</td>
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<td>1 3/4 in.</td>
<td>2500 lbs</td>
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<tr>
<td>2 in.</td>
<td>2 1/2 in.</td>
<td>1 3/4 in.</td>
<td>2500 lbs</td>
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#### SQUARE EDGE

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<th>Actual</th>
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<td>2 in.</td>
<td>1 3/4 in.</td>
<td>2500 lbs</td>
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<td>2 in.</td>
<td>2 1/2 in.</td>
<td>1 3/4 in.</td>
<td>2500 lbs</td>
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#### BEECH, BIRCH, HARD MAPLE AND PECAN

<table>
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### JOINTED FLOORING—i.e., SQUARE EDGE

<table>
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<td>2 in.</td>
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### NORTHERN HARD MAPLE FLOORING BLOCKS, TO BE LAID IN MASTIC OVER CONCRETE (OR WOOD) SUBFLOORS IN HERRINGBONE PATTERN, IN SQUARES, CONTINUOUS STRIP OR OTHER PATTERN

#### SINGLE PIECE BLOCKS

<table>
<thead>
<tr>
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<th>Actual</th>
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<tr>
<td>2 in.</td>
<td>2 1/2 in.</td>
<td>1 3/4 in.</td>
<td>2500 lbs</td>
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#### FABRICATED BLOCKS

Squares of 1/2-inch thickness: face widths of 1 1/2, 2, 2 1/2 and 3-inch and proportionate face length, as desired, from 8 1/4 to 15 1/4 inches. Also edge-grain stock in 1 1/2-inch face width and in thicknesses from 1 to 3/16-inch. Lengths principally 12 inches.

#### CONTINUOUS STRIP BLOCKS

1/8 in. and 3/16-inch thicknesses—face widths 1 1/2, 2, 2 1/2 and 3-inch, lengths from 8 1/4 to 18 inches, but principally 12 inches. Some of above sizes are also available in Beech and Birch.

Some of above sizes are also available in Beech and Birch. For list of manufacturers producing block and patterned flooring and information on installation procedure, write for list of manufacturers producing block and patterned flooring and information on installation procedure.

American Builder
OAK FLOORING HELPS GIVE LOW-COST HOMES ALL BASIC FUNDAMENTALS

Laying oak over concrete adds beauty, durability and "healthfulness" to every home.

Builders who include all the basic fundamentals such as "healthfulness", durability, economy and beauty—in the low-cost homes they build will find them easier to sell. Cost cutting should be confined to "frills" and size.

All the basic fundamentals are provided by oak flooring. And, with new methods of laying oak over concrete, low-cost homes need not forego the benefits of oak. Oak can now be nailed to screeds set in mastic* And, there are grades of oak priced for even the lowest-cost homes.

Housewives know that oak flooring will have that "just-installed" look for a lifetime—with a minimum of care. That's one reason 85% of all prospective homeowners want oak in their next home. The clean, sanitary appearance of oak makes it the "healthiest" flooring on the market.

*SEND TO NATIONAL OAK FLOORING MFRS. ASS'N., STERICK BLDG., MEMPHIS 3, TENN., FOR FREE, FHA-APPROVED INSTRUCTIONS FOR LAYING OAK OVER CONCRETE

APRIL 1952
IN LAYING PARQUET FLOORING it is
necessary to remove all sawdust and trash. Mastic is usually spread to a
minimum average thickness of 3/32-
inches thick. Surface must be
thoroughly dry and swept free of dust and
trash. Mastic is usually spread to a
minimum average thickness of 3/32-
inches thick. Surface must be
clean and perfectly level.

Scratches and other small marks
caused by handling may be removed
by sanding or scraping. An electrically
operated sanding machine is used for this work. For fine floors
most manufacturers advise at least
four sandings, starting with No. 2
sandpaper and graduating down to
No. ½, No. 0, and No. 00. A final
buffing with No. 000 assures an even
smooth surface. Authorities recom-
mand that final traverse be made by
hand.

Stain and Filler

Apply first coat of stain or other
finish the same day as the last sand-
ing. This is important. Otherwise the
wood grain will have risen and the
finish consequently will be slightly
rough. Stain is not used if the natural
color of the wood is desired for the
final finish. When used it is applied
first. It should be put on evenly with
a 3- or 4-inch brush.

Paste wood filler is used to fill the
minute surface crevices in oak and
other hardwoods having large pores.
Filler is applied after stains and some-
times after floor seals but always be-
fore other finishing materials. It
should be allowed to dry 24 hours
before the next operation is begun.
Wood filler may be colorless or may
contain pigment to bring out the grain
of the wood.

Heavy Duty Wood Floors

Floors laid in mills, factories, re-
tail stores, gymnasiums, schools and
other heavy traffic locations are
heavy-duty floors. Such floors are
often called for the better grades of floor
materials and are installed with more
consideration given the floor base.
Close attention is also paid to the ex-
ansion factor since such areas are
more often much larger per unit area.

Edge-grain Flooring is pretty well
confined to the heavy-duty installa-
tion. Method of installation usually
includes the use of mastic. Pieces
approximately 12 inches in length are
placed with what would normally be
considered the edge of the board be-
ing used as the floor surface. Thick-
nesses run from 33/32 to 2 1/4 inches
while face surface is about 1 1/2 to
1 1/4 inches wide. Northern Rock
Maple is usually used.

Corkboard may be used between the
subfloor and the edge-grain floor-
ing, particularly on such installa-
tions where resiliency is a factor,
such as gym floors. An additional
method of binding has been de-
volved which involves the driving of
lengths of saw-toothed, steel splines
along the edge of the flooring as
each section is laid.

End Grain Floors. Grooved or lug
type, creosote treated, blocks made of
yellow pine or oak and installed with
the end grain as the floor surface,
are widely used for heavy-duty fac-
tory floors. Blocks are creosote
treated at the factory by pressure
methods which leave about 6 pounds
of creosote in each cubic foot of tim-
ber. Blocks are available with 2-
2 1/2- or 3-inch depth, approximately
2 1/2 to 4 inches wide and may vary
from four to 8 1/2 inches in length.
It is recommended they be installed
on a smooth, level, seasoned con-
crete base. After a priming oil coat
has been applied and dried on the con-
crete, a coating of hot pitch is ap-
plied, not over 3/4-inch thick, and the
blocks laid with the grain vertical.
After this pitch coat has hardened,
Joists should be broken by a lap of
at least one inch. Whenever possible,
blocks should be laid with their
length at right angles to the prevail-
ing line of heaviest traffic; across
aisles, for example. Leave a bitum-
inous expansion joint of at least one
inch against walls and around col-
umns and obstructions. A pitch filler
compound is used for the final finish.
Make sure all joints are filled within
3/4-inch of the surface.

Transverse Expansion Joints. Try
to avoid transverse expansion joints
in the concrete base. If they do exist,
the joints must be far enough below
the surface of the floor to elimi-
nate the possibility of expansion ma-
terial being forced out and bulging
the blocks above the floor surface
during expansion of the concrete base
floor.

Strip End Grain Floors. Flexible
strip end grain blocks are installed in
factories, gymnasiums, drill halls,
schools and such heavy duty loca-
tions. Blocks of kiln-dried yellow pine
are held together by wire trusses in
strips from two to eight feet. Blocks
are factory-impregnated with a color-
less, odorless preservative which does
not stain the wood. Strips of blocks
are cemented to the concrete floor
with bituminous cement applied at
approximately 275° F. Cork board
base may be preferred, depending on
floor use. For factory floors, a seal
coat is applied with a squeeze after
floors have been laid. Joints are
provided necessitating a finer surface,
the floor is sanded and then a paste
filler is squeezed over the surface
and rubbed in. Additional finish
coats, depending upon surface de-
sired, may then be added.

Other Heavy Duty Floors

Strip and parquet floors are also
extensively used in both medium and
heavy duty installations. The heavier
weight sizes used are governed by
the extent and type of traffic to which
the floor will be subjected. Of pri-
mary concern, for heavy duty and
medium duty installation, is the floor
base. In the majority of cases a

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(Continued on page 458)
MULTI-PURPOSE FLOORING simplifies planning... cuts building and remodeling costs

LOW-COST, STANDARD-GAUGE

ARISTOFLEX VINYL-ASBESTOS TILE FLOORING

- Resistance to acid, grease, and alkali make it ideal for such installations as laboratories, cafeterias, hospitals.
- Durability is outstanding. It's vinyl-asbestos through and through—no felt backing.
- Sparkling colors and easy-to-clean surface make it perfect for all installations.
- Recommended for installation ON, ABOVE, or BELOW GRADE.
- May be laid direct on concrete, terrazzo or ceramic.
- Can be installed on wood over 15-lb. saturated felt over gypsum, plank or unfinished concrete slab with suitable underlayment... and over magnesite, above grade.
- LOW COST is comparable to grease-proof asphalt tile.

ARISTOFLEX is vinyl-asbestos from top to bottom—no felt backing. It resists household acids, alkalis, petroleum solvents, oils, greases, turpentine, and fire... is tough and flexible... and has excellent indentation recovery. Vivid colors and marbleization go clear through each tile. As a result, ARISTOFLEX is one of the most durable of floorings. It wears for years and years... and steadfastly maintains its sparkling beauty. The smooth surface sheds dirt... wipes clean with a damp mop. Maintenance costs are low. Available in 9" x 9" standard gauge and 1/8" tiles.

For vinyl-asbestos flooring quality with economy, look to ARISTOFLEX.

Joliet, Ill. • Long Beach, Calif. • Newburgh, N.Y.

MASTIC TILE CORPORATION OF AMERICA
Member: Asphalt Tile Institute

Send specification data and complete details about low-cost MATICO ARISTOFLEX vinyl-asbestos tile flooring.

NAME
FIRM
STREET
CITY...
ZONE...
STATE...
Grading of Hardwood Floors

The principal American producers of hardwood strip flooring have, through two major trade associations, adopted uniform grading rules and regulations for commercial practice. Approved by the Bureau of Standards of the U.S. Department of Commerce, these rules and regulations are enforced rigidly, in part by the organizations themselves. As a result dealers and consumers are assured of high standard merchandise and the industry is protected against sharp practices. The two organizations are the National Oak Flooring Manufacturers' Association, with headquarters at Memphis, Tenn., and the Maple Flooring Manufacturers' Association, Oshkosh, Wis.

Every bundle of flooring produced by a member of either association is identified as to grade, and is guaranteed to meet all established specifications. Often the manufacturer's name and a mill mark of identification are stated on each bundle.

There are no official grading rules for plank, parquet and block flooring, but generally the different grades correspond to those of strip flooring.

Hardwood flooring grades are based principally on appearance. All regular grades possess adequate strength, durability and resistance to wear, hence these qualities are not factors. Chiefly considered are such imperfections as knots, streaks, pin worm holes and in some cases sapwood and variations in color. Imperfections in processing also are factors.

OAK — In Clear Grade Oak the amount of sapwood is limited. Otherwise, variations in color are disregarded in grading. Red and White Oak ordinarily are separated, but that does not affect their grading. In most cases the average length of strip flooring pieces is greater in the higher grades. Oak is classified into three grades of quarter-sawn stock and four of plain-sawn. In descending order the quarter-sawn grades are: Clear, Sap Clear and Select. Plain-sawn grades are: Clear, Select. No. 1 Common and No. 2 Common. (See Table below).

MAPE, BEECH, BIRCH — Rules governing the grading of Maple. Beech and Birch are virtually identical for all three species. Neither sapwood nor varying natural color is considered a defect in standard grades. These species are produced in three standard grades — First, Second and Third, with First being the highest. Each also is available in a special grade selected for uniformity of color.

PECAN — Pecan is processed in seven standard grades, two of which specify all heartwood, and one bright sapwood. Otherwise color variation is not considered.

STANDARD OAK FLOORING GRADES

Quarter Sawed

Clear — The face shall be practically free of defects except ¼ of an inch of bright sap. The question of color shall not be considered.

Bundles to be 2 ft. and up, not to exceed 25% under 4 ft. Average length 4½ ft.

Sap Clear — The face shall be practically free from defects but will admit unlimited bright sap. The question of color shall not be considered.

Bundles to be 2 ft. and up, not to exceed 25% under 4 ft. Average length 4½ ft.

Select — The face may contain sap, and will admit pin worm holes, streaks, slight imperfections in dressing or small, tight knots, not to exceed one to every 3 ft. in length.

Bundles to be 2 ft. and up. Average length 4 ft.

Plain Sawed

Clear — The face shall be practically free of defects except ¼ of an inch of bright sap. The question of color shall not be considered.

Bundles to be 2 ft. and up, not to exceed 25% under 4 ft. Average length 4½ ft.

Select — The face may contain sap, and will admit pin worm holes, streaks, slight imperfections in dressing or small, tight knots, not to exceed one to every 3 ft. in length.

Bundles to be 2 ft. and up. Average length 4 ft.

No. 1 Common — Shall be of such nature as will make and lay a sound flooring without cutting.

Bundles to be 2 ft. and up. Average length 3 ft.

No. 2 Common — May contain defects of all characters, but will lay a serviceable floor.

Bundles to be 1½ ft. and up. Average length 2½ ft.

Bundles to be 2 ft. and up, not to exceed 25% under 4 ft. Average length 4½ ft.

BEECH, BIRCH AND HARD MAPLE

First Grade — Shall have the face practically free of all defects, but the varying natural color of the wood shall not be considered a defect. Bundles shall be 2 to 16 ft., as the stock will produce; the proportion of 2 and 3 ft. bundles shall be what the stock will produce up to 25%.

Second Grade — Will admit of tight, sound knots and slight imperfections in dressing, but must lay without waste. Bundles shall be 1½ to 16 ft., as the stock will produce; the proportion of 1½ to 3 ft. bundles shall be what the stock will produce up to 40%.

Third Grade — Must be of such character as will lay and give a good serviceable floor. Bundles shall be 1½ to 16 ft., as the stock will produce; the proportion of 1½ to 3 ft. bundles shall be what the stock will produce up to 60%.

Special Grades — First Grade White NOFMA Hard Maple is special stock, selected for uniformity of color. It is almost ivory white and is the finest grade of NOFMA Hard Maple Flooring produced.

First Grade Red NOFMA Beech and NOFMA Birch are special grades produced from all redface stock and are specially selected for color. The color is rich, being a soft tint which lends distinctiveness to these two woods.

American Builder
America's most beautiful walls are an inexpensive luxury with CORONET Plastic Wall Tile. Bevel edged for body and accurately sized for perfect installation, it is durable, sturdy and easy to wash down. Available in sixteen soft colors and bright decorator-approved pastels in plain or marble-tones. Coronet Plastic Wall Tile is resistant to common household acids and greases. It is customer-tested as the most profitable plastic wall tile you can sell.

**PARQUETRY**

Recommend PARQUETRY where hardwood effect is desired! Adaptable to any architectural plan, its true Natural Oak appearance enhances the beauty of modern or period furniture. Recommend PARQUETRY — for any room.

HAKO Asphalt Tile Flooring is a double-profit companion for CORONET Plastic Wall Tile. Each precision-cut square has the self-decorating features of style, design and lasting beauty. Its wide variety of rich warm solid or marbleized tones will delight any customer. Factory waxed and conditioned for heavy wear, it resists stains and indentations. A HAKO Asphalt Tile Flooring customer is a happy and satisfied one.

**HACHMEISTER-INC.**

General Offices
PITTSBURGH 13, PA.
move good bond produced underlayment Flooring in Rolls. Cut resilient flooring to fit accurately at all points with a mini thin, even coat into place. Phe roll well roller to remove air pockets and assure adhesion. Except for pattern goods, all resilient flooring should be overlapped slightly at the seams and cut through both thicknesses to insure a tight finished seam joint. Pattern goods must be carefully butted without further cutting to retain symmetry of design.

Flooring in Rolls. Cut resilient flooring to fit accurately at all points with a minimum of cross seams. A thin, even coat of paste is spread on the floor and the covering is pressed into place. Then roll well with a roller to remove air pockets and insure adhesion. Except for pattern goods, all resilient flooring should be overlapped slightly at the seams and cut through both thicknesses to insure a tight finished seam joint. Pattern goods must be carefully butted without further cutting to retain symmetry of design.

Tile Flooring. Determine the exact center of the area to be covered with tile flooring. Do this as shown in diagram shown elsewhere in these pages. Starting at the center line, spread adhesive in a thin even coat with a notched trowel. Cover enough area for several tiles and apply at once. Start laying tiles from the center point and work toward the walls so that last tile is set on perimeter or border of the room. Cut and fit tiles carefully around all projections and fixtures. When laying tiles, butt firmly against each other but do not slide into position as this may force adhesive up between the seam joints. Borders should follow the line of permanent fixtures and border

Laying Linoleum on a Plywood Subfloor. The plywood subfloor saves time and labor in this operation, since each panel covers 32 square feet. Large size means minimum linear footage of joints, producing superior base for wood finish flooring as well as for tile or linoleum.
Have you noticed how many prospects have been asking if the floors are Kentile?

Sure, and that's why we're going to use them in the new subdivision. It's good business to give customers what they want.

Long-lasting Kentile adds colorful beauty to any room... offers low-cost sales appeal by giving prospects a quality brand they know and trust.

Lower building costs and raise quality with Kentile Floors

Progressive builders and architects know that a house has to be built to sell... and they know that the nationally-advertised quality of Kentile provides them with a plus feature that home buyers recognize and appreciate... a brand name that stands for low-cost quality and industry leadership.

Kentile can be speedily and economically installed any place... over any smooth, firm, interior surface... even below grade over concrete in direct contact with the earth. And, once in place, Kentile's wide range of modern decorator colors bring beauty for years and years... because the colors go all the way through the tough tiles and can't wear off.

Yes, the obvious advantages of Kentile's low cost and long life have made it first choice with the designer, builders and buyers of small homes... Everyone who demands a quality product to design, install, sell or live with.
SAFETY-CUTS used to prevent damage when laying linoleum. (A) Corner safety-cut is used to relieve strain on material. This allows the goods to be shoved closely into a corner and also flash slightly up both walls so that nailing the linoleum to the wall is easy. (B) Sidewall safety-cut relieves buckling. The cut is never made deeper than the width of the trim to be removed when the material is cut to fit the wall. (C) An outside corner safety-cut allows for fitting around projections. This cut frees one section of the goods so that it falls to the floor. The other section can be trimmed off at the floor line of the projection.

Regular or cove base or moulding, can be installed after entire application of resilient flooring is finished. Mouldings are available of wood, metal or resilient composition. Such resilient cove bases may be used in colors to match the flooring or lend attractive color complement.

Non-Resilient Floors

Installation of non-resilient floors is handled nearly exclusively by installation contractors specializing in such types. Concrete falls in the non-resilient classification and consists of portland cement, sand, gravel and water, in varying amounts upon which, in great measure, the smoothness of the finished floor depends. Skillful troweling combined with use of final sealing compounds result in a smooth surface of durable hardness. Such floors must be applied over a strong, rigid subfloor.

To create a terrazzo floor, marble chips are added to a matrix of portland cement. When the floor is thoroughly hardened, the entire floor is honed to a smooth, almost glass-like surface by use of a wet grinding machine. Metal dividers are used to sectionize the floor. Pre-formed metal designs and pictures are often used to place trade-marks, names and decorative treatment to the floor.

You can NOW lay resilient or wood flooring directly on on-grade concrete slabs.

STAFCO does the job!

Gannett Homes specify use "Stafco" ON-GRADE. Scaler to seal the concrete slab before the finished Parkay floor is installed.

STAFCO makes possible the installation of linoleum, rubber tile, carpet, wood, or similar type of flooring on concrete which is in contact with the ground. Stafco is easily applied and forms a membrane through which capillary moisture or alkali cannot penetrate.

Write today for complete installation details

STANDARD FLOOR CO.

Oxychloride cement, magnesium oxychloride cement or magnesium floors are the same. Oxychloride cement hardens to form a dense, stone-like material of fine, smooth texture. It is made up of both organic and inorganic materials which gives it a resiliency not found in other floors falling in the non-resilient classification.

THIS DIAGRAM shows the steps taken to determine direction for diagonal installation of tile. (1) With point M as center and using any convenient radius, mark A, B, C, and D on lines SR and TU. (2) With B and C as centers and using a radius greater than the distance between points C and M mark intersecting arcs at E. (3) With A and D as centers, mark intersecting arcs at F. (4) Strike a chalk line using points E and F through M to establish points Y and Z. (5) Use centers A and B to find point G. (6) Use centers C and D to find point H. (7) Strike chalk line using points G and H through M to establish points W and X.

REGULAR OR COVE BASE OR MOULDING can be installed after application of a resilient flooring has been completed.
How to Estimate the Amount of Hardwood Flooring Required for a Given Space

Strip Flooring

To determine the board feet of flooring needed to cover a given space, first find the area in square feet, then add to it the percentage of that figure which applies to the size flooring to be used, as indicated below:

<table>
<thead>
<tr>
<th>Percentage</th>
<th>Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>50%</td>
<td>25.32 x 1 1/2</td>
</tr>
<tr>
<td>37 1/2%</td>
<td>25.32 x 2</td>
</tr>
<tr>
<td>33 1/3%</td>
<td>25.32 x 2 1/4</td>
</tr>
<tr>
<td>25%</td>
<td>25.32 x 3 1/4</td>
</tr>
<tr>
<td>33 1/3%</td>
<td>36 x 1 1/2</td>
</tr>
<tr>
<td>25%</td>
<td>36 x 2</td>
</tr>
<tr>
<td>33 1/3%</td>
<td>36 x 2 1/2</td>
</tr>
</tbody>
</table>

The above figures are based on laying flooring straight across the room. Where there are bay windows or other projections, allowance should be made for additional flooring. It is always well to order 5% additional flooring to take care of floor layers’ cutting and possible damage.

Block and Plank Flooring

These are sold on the basis of floor coverage. It is necessary to provide only an additional 5% to floor area to compensate for floor layers’ waste and possible damage.

Rules Governing Re-Inspection

In the manufacture and grading of oak flooring the very best types of machinery, equipment and workmen are employed, but occasionally some pieces get into wrong grades by error.

Therefore, if the re-inspection results in a difference in favor of the purchaser of more than five (5) per cent in feet, as shown in the invoice, then the shipper will be considered as being in the wrong and shall issue a corrected invoice in accordance with the re-inspection, and pay all the expenses of the re-inspection.

If on the other hand, the difference is only five (5) per cent or less in feet, then the party making the complaint shall not be entitled to any reduction from the invoice and shall furthermore, be charged with all the expenses of the re-inspection.

The quality and condition of the oak flooring when it leaves the manufacturer is held to govern the re-inspection.
NEW Simplified BUILDING BOOK

CUTS YOUR JOB 'FIGURING' TIME

Catch up on your orders — Step up your production
1225 Drawings, Materials Lists save valuable hours

BUILDERS, CARPENTERS, CONTRACTORS, ELECTRICIANS, LUMBER DEALERS, MASONs, PLUMBERS

Here, in 1,225 of the clearest, most informative drawings ever made and with short, easy-to-read instructions—HOW TO EXPAND AND IMPROVE YOUR HOME, gives you the step-by-step directions for dozens of the building, repairing, modernizing, and remodeling jobs most in demand today.

Every single step for each specific job such as finishing an attic, building a garage or installing a picture window is complete in this book. No need to dig one part out of your memory, this part from one book and another part from some other book.

HOW TO EXPAND gives you every detail of the latest experience-proven techniques, using the newest materials. Step by step — of course it will! And look at this — there's a complete materials list drawn up for each job—everything from cement to baularades to nails, and including a 10% allowance for waste.

YOUR TIME IS MONEY

In the building business these days it's not lack of jobs but lack of time that keeps a man's income lower than he'd like. That's particularly true of those profit-loaded modernizing and remodeling jobs. HOW TO EXPAND's up-to-date methods save you an amazing amount of time on jobs like these:

- Finish an Expansion Attic
- Build a Porch
- Enclose an Existing Porch
- Modernize a Kitchen
- Build a Garage
- Broodway
- Add a Bathroom
- Build a Cellar Playroom
- Add Dormers
- Add a Wing
- Make Two Rooms Out of One
- Modernize the Exterior
- Install Partitions
- Windows
- Build Closets and Storage Areas
- Hang Doors
- Build Stairs
- Apply Roof Shingles
- Install Kitchen Cabinets
- Build a Breakfast Nook
- Replace Floor Covering
- Make Screens and Storm Sash
- Lay Flooring
- and Many More Jobs for Every Type of House, Old or New

PERFECT FOR TODAY'S MARKET

You've never seen any building book so convenient, so well organized, so marvelously clear and easy to use. It's the perfect answer to your needs in today's gigantic home modernization and remodeling market. Drawings, photos, and specific directions follow through on every step of carpentry, masonry, plumbing, electrical work, etc.

USES TESTED PROFESSIONAL METHODS

Its extra-easy methods are professionally accurate—presented by the author of such top-notch building books as "Small House Carpentry," "Interior and Exterior Finish," and "The Masonry House"—checked and approved by leading manufacturers, builders, associations and government agencies. Designed originally with the amateur craftsman in mind, this remarkable guide is its most effective tool in the hands of a professional builder like yourself.

CLINCHES SALES TO HOMEOWNERS

HOW TO EXPAND AND IMPROVE YOUR HOME has other advantages, too. Organized for self-instruction, it's an exceptionally fine manual for anyone starting out in the trade. With its entirely different style of presentation, its accent on the highly active remodeling field, and its helpful content of modern methods, HOW TO EXPAND is the sort of building book no wide-awake person in the building trade would think of passing up.

Of extreme importance, also, is the fact that the book is written in language to be understood by the layman—by the homeowner and thus, by reading HOW TO EXPAND and putting yourself in the customer's place you are able to "get yourself across" to the customer and clinch more sales.

No matter how many short-cuts you now employ, or how many building books you've owned or read, there's a great new experience ahead for you in HOW TO EXPAND AND IMPROVE YOUR HOME.

MODERN TECHNICAL DATA

for HOW TO EXPAND AND IMPROVE YOUR HOME was supplied by such leading manufacturers, trade associations and government agencies as these:

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- Armstrong Cork Co
- E. L. Bruce Co
- Congoleum-Nairn Inc
- F. W. Dodge Corp
- Flintkote Co
- Johns-Manville
- Montgomery Ward
- National Gypsum Co
- Owens-Illinois Glass Co
- Revere Copper and Brass Inc
- Sears, Roebuck and Co
- United States Gypsum Co
- Westinghouse Electric Corp
- Westernyan Sales Co
- The Wiremold Co
- Yale and Towne Manufacturing Co
- Amer. Roofing and Siding Contractor
- American Society of Architectural Hardware Consultants
- Asbestos Cement Products Assn
- Construction Research Bureau
- Gypsum Association
- Portland Cement Association
- Structural Clay Products Institute
- Red Cedar Shingle Bureau
- Department of Commerce
- Bureau of Standards
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Please send at once copy (copies) of the new-type time-saving building book HOW TO EXPAND AND IMPROVE YOUR HOME to examine FREE for 10 days. If you are not completely satisfied, return the book(s) within 10 days of receipt and owe nothing. Otherwise, I will keep the book(s) and remit the price ($5.95 each) plus a few cents for postage and handling.

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Street ____________________________
City ____________________________ State ____________________________

AMERICAN BUILDER
KNOWLEDGE of the fundamentals of how insulation works is essential to any intelligent discussion of the subject with the public. It is also essential to any understanding of the correct choice of the type of insulation to be used, how much to use and its proper installation. The primary purpose of insulation is to retard the passage of heat, either from the outside or from the outside into a structure.

Heat is a form of energy. It always travels from a warm surface to a cooler one. Heat travels in three ways.

1. **By conduction.** Heat passing through solid materials, as through steel or dense concrete, travels by conduction. Dense materials conduct heat more rapidly than materials in which particles are separated by tiny air cells.

2. **By convection.** When heat travels through the air, it travels by convection. Air in contact with the cold side of a wall or a cold window tends to settle as it cools. Air in contact with a warm wall or unit rises. These reactions of air to cold and warm walls and objects set up a continuous circulation which moves heat across air spaces.

3. **By radiation.** Radiated heat moves at high speed through air without heating the air and flows in direct lines from a warm surface to a cooler surface. Sun heat is radiated heat. Heat moving from a human body to a nearby colder surface, such as a wall or ceiling, is radiated heat. Radiated heat is absorbed by the object or wall which it reaches in proportion to that object’s affinity to absorb heat.

All building materials such as wood, masonry, and even wide air spaces permit the passage of heat from the interior to the exterior in winter or from the exterior to the interior in summer. This rule also applies to insulation. Insulation never completely stops the passage of heat, but it is manufactured for the express purpose of retarding the greatest possible amount in areas insulated.

Insulation’s function then is simplest—to keep walls, ceilings and floors resistant to the escape of heat from indoors and to keep the indoor surfaces of rooms at a temperature close to the temperature of the air in the rooms. In summer outdoor heat is held within the walls, maintaining lower interior surface temperatures than would be possible without insulation.

**ABBREVIATIONS AND TERMS**

**B.T.U.—**British Thermal Unit. The amount of heat required to raise the temperature of one pound of water one degree Fahrenheit.

**"k"—**This represents conductivity. It is used to show the amount of heat B.T.U.'s which will pass through one square foot of a specified material one inch thick for a temperature differential of one degree F between the two surfaces.

**"C"—**Used to designate conductivity of a material or combination of materials to show the amount of heat B.T.U.'s that will pass through for the thickness or type under consideration per hour, per square foot, per degree F temperature difference between the two surfaces. The "C" value of an 8-inch hollow concrete block is 1.00.

**"U"—**Designates the total or over-all transmission of heat B.T.U.'s from air on one side to air on the other side of a wall, roof, ceiling or floor per hour, per square foot, per degree temperature difference between the air on the two sides of the section or combination of materials. The "U" value of an uninsulated frame wall consisting of wood siding, wood sheathing, 2x4 studs, gypsum lath and plaster is 26. If insulated with two inches of typical mass insulation, the "U" factor becomes .095.

The three measurements, "k," "C," and "U," as defined above are basic and should be understood by anyone discussing insulations so that they may be interpreted in an intelligent manner when dealing with the public on insulation matters. The lower the figure used, the greater is the resistance to the flow of heat.
WHERE TO INSULATE

VENTILATION above attic insulation is essential to summer comfort and to help control any moisture vapor and condensation conditions which might develop in winter. Two standard methods are louvers and ridge and eave ventilators.

ALL dormers should be insulated with special care. The entire surface of the exposed walls as well as the ceiling sections must be enclosed with insulating material. All narrow spaces around windows should be carefully packed to assure maximum efficiency.

INSULATION should form an envelope to separate the heated rooms of a house from the unheated porches, garage, attic and crawl space. If the attic is not used, insulation should be placed in the attic floor. If a room is built in an attic or low upper-story area, insulation should be installed in the walls and ceiling by following the outline of the room. Flow of air from the eaves to gable or ridge louvers should not be blocked at the knee walls.

OPEN porches are frequently converted into year round living quarters so it is desirable to insulate the ceiling at time of construction. If space above an open porch is occupied, the floor of the occupied space should be insulated.

CONCRETE slab floors in cold climates should be insulated with one or two inches of slab insulation or with insulating concrete. The amount depends on climatic conditions. In extremely cold areas, two inches of rigid water-proof insulation placed along the exposed edge of the floor and extending two feet under the floor on the perimeter, or an application of insulating concrete, is recommended.

IN DETERMINING where to insulate in a structure the general rule to follow is to insulate the walls, ceilings and floors immediately surrounding the area to be heated in cold weather. For maximum comfort in warm as well as cold weather, exterior walls should always be insulated. The builder has a wide choice of insulating materials from which to choose in the two motor groups or combinations of the two motor groups which depend on bulk or thickness for heat resistance, and reflective insulations which depend on the character of surfaces for efficiency.

FLOORS over all unheated areas such as crawl spaces, bay windows and porches should be well insulated. These spaces must also be well ventilated and prevented from giving an excessive amount of moisture to living quarters.

WHERE HEAT IS LOST OR GAINED IN A BUILDING

Studies of typical buildings as to relative heat loss and gain through various parts or sections are given below. These values are not for the same structure and are typical enough to be indicative of heat transmissions:

<table>
<thead>
<tr>
<th></th>
<th>Heat Loss in Winter</th>
<th>Heat Gain in Summer</th>
</tr>
</thead>
<tbody>
<tr>
<td>Walls</td>
<td>32.9%</td>
<td>33.6%</td>
</tr>
<tr>
<td>Ceilings</td>
<td>22.2%</td>
<td>24.2%</td>
</tr>
<tr>
<td>Floors</td>
<td>3%</td>
<td>3.7%</td>
</tr>
<tr>
<td>Glass and doors</td>
<td>29.9%</td>
<td>26.4%</td>
</tr>
<tr>
<td>Infiltration</td>
<td>14.7%</td>
<td>12.1%</td>
</tr>
<tr>
<td></td>
<td>100.0%</td>
<td>100.0%</td>
</tr>
</tbody>
</table>

The above figures were assembled from studies of typical two-story houses. The percentages would vary somewhat on one-story houses because the ceiling area would be proportionately greater and the wall area less.
INSTALLATION TIPS

The efficiency and economy of any installation can be largely nullified if the products are not properly applied. Insulation products must be used in places and conditions for which they were intended. If special problems or unusual conditions develop, manufacturers are always ready to lend assistance to assure maximum satisfaction from the product.

Insulated walls should be so constructed to avoid high heat conductance through the insulation. Fill materials must be installed so that they will not settle and leave vacant spaces in the insulated areas.

INSULATION VALUE

When air spaces within walls constitute a part of the insulating value, the material must be installed so that the air spaces are sealed and prevent interchange of air between warm and cold air areas. If reflective insulating materials are used they must be so installed that the reflective surface will be protected from any foreign materials which would increase the emissivity coefficients and should not be laid in contact with other materials.

The insulating value of many materials is affected by moisture. It is now common practice to protect these materials by applying some moisture-resistant membrane as near as possible to the warm surface of walls where moisture-producing conditions exist.

Install materials in such a manner as to avoid air circulation between hot and cold spaces. For instance, a wood frame wall of standard type, with a 1/2-inch blanket insulation well installed in the central vertical plane of the stud section, gave a test coefficient of .12. This same wall, with 3/8-inch cut off, from the top and bottom of the blanket, so as to allow air circulation between the two air spaces, gave a test coefficient of .18. Similar reduction in the insulating value of a reflective material may be expected if it is not properly sealed to prevent air circulation between the hot and cold air spaces.

A similar condition may exist in masonry walls with vertical air spaces, when the mortar between the joints is buttered only around the edges, as is common practice. The webs, or partitions, between the air spaces are not sealed in the central part of the block, and there is direct communication between the air spaces on the cold and warm side of the wall.

Permanent ventilation in attics above insulation is essential to good performance. In summer it permits the escape of sun heat and in winter it carries off vapor that passes from the house into the attic. Any arrangement that permits free circulation between the insulation and roof is suitable. Two standard methods are louvres, and ridge and eave ventilators. Louvres should be placed as high as possible at the peak of the gables. Ridge and eave ventilators must be constructed to allow circulation in at the eaves and out at the ridge. If knee walls are constructed, they must not block this circulation. To insure adequate ventilation, there should be at least one-quarter square inch of free opening in each of two permanently open vents for each square foot of insulated attic area.

LOOSE FILL

Various types may be packed, poured or blown into the spaces formed by framing members or masonry. Normally, they are used for insulating existing buildings.

Mineral Wool includes three types of noncombustible insulation known as rock wool, slag wool or glass wool. They may be fabricated into nodules, into batts or blankets. Mineral-wool filled partitions have been accorded a one-hour fire rating when faced with wood lath, or equivalent, and plaster. When faced with metal lath and plaster the fire rating is 1 1/2 hours.

Wood fiber, wool fill includes several insulations made from wood fiber to produce a lightweight fleecy material. These are generally treated to render them flame resistant, vermin repellent and moisture resistant.

Vermiculite is an inert, lightweight, granular insulating material manufactured by exploding an aluminum magnesia silicate mineral, which is a form of mica.

The final product is graded into different sizes for various uses, including building insulation, lightweight insulating concrete aggregate and aggregate for insulating plaster.

Application

Loose fill insulation of the granular or fibrous types may be poured from bags into the spaces between the ceiling joists to the desired depth, usually four inches. It may be poured in place as soon as the plaster base or interior finish is applied, except where open lath are used. In these cases, it is necessary to wait until the plaster has been applied and has thoroughly dried. This is true whether the insulation is used in sidewalls or ceilings. If a vapor barrier is to be installed in the ceiling it should be put in place on the under side of the joists before the interior finish is applied.

APRIL 1952
poured to insure a complete fill below plaster clinches and around other obstructions such as conduit or pipes.

Double (cavity) masonry walls can be satisfactorily insulated with fill insulations. Variation in materials used and in construction methods make it advisable to follow the manufacturer's recommendations closely when this is done. Concrete block walls are sometimes insulated during construction by filling cores of blocks with insulation. Because of the conductance through the solid portion of the block, such a wall does not provide as much insulation as the insulated double or cavity wall but it does provide more insulation than the wall would with the cores left open. *Extreme care must be taken under these conditions to make sure insulation will always remain dry.*

In insulating existing structures with fill insulation, either poured or blown in, the use of a vapor barrier is not mandatory, but it is good insurance against condensation troubles as a result of housekeeping methods which produce high humidities.

**BLANKETS**

Blanket insulations are flexible units more than 48 inches in length and wide enough to fit between studs on conventional 16 or 24-inch centers. This material is manufactured to control thicknesses and either folded in cartons or packed in rolls. It is made of mineral wool, wood fiber, cotton and animal hair. The fibers are either naturally fire resistant, moisture and vermin resistant or are treated to make them so.

Because of the variety of material used for blanket insulations, the manufacturing processes vary a great deal. The felted or wool-like matting, however, are of three general types: 1—Those having the fibers completely encased on all sides with Kraft or other paper, one side of which is a vapor barrier; 2—Those which have a vapor barrier on one side only and are not completely encased; 3—Those which have no paper covering. These depend on the interlaced fibers for sufficient strength, with or without stitching, to hold the material into a compact matting or blanket.

Blankets in the first two classifications are usually provided with a nailing flange to conform to standard spacings in wood framing. Those in the second classification are usually made sufficiently wider than the standard framing spaces to permit edge fastening through the material.

Blanket insulations are generally produced in one, two, three and 3½ inch thicknesses. The thicknesses in

When granular or fiber insulation is applied to existing structures in the side walls, a plumb bob should be dropped into each stud space to check for fire stops or headers which might obstruct the insulation flow. When vermiculite fill insulation is installed in sidewalls of existing structures it is well to vibrate the walls slightly with a rubber mallet or short 2 x 4 as the insulation is

(Continued on page 468)
For the speedy, economical construction of FIELD OFFICES and TOOL SHEDS...

...use a material that's strong and crackproof—that's completely weatherproof, light in weight and easily worked...a material that's made in Big Sheets—up to 8' x 14'—in sizes two men can handle easily and at considerable savings in labor and materials.

Use Homasote—the oldest and strongest insulating-building board on the market. Here is a board that has proved itself in industrial, residential and farm buildings—and in every climate from Alaska to Little America. Homasote's resistance to weather makes it the perfect protective material for field offices and tool sheds.

Homasote saws and nails like wood and need not be painted. The Big Sheets mean that you build better, faster and at less cost. Field offices and tool sheds may be easily transported from job to job.

For comfortable working conditions for men in the field—for full protection of records and tools—specify Homasote... Let us send you literature and specification folder showing its many uses.

BLANKETS are cut in continuous strips to required length for each stud space. In installing batts or blankets, large pipes in walls may require removal of part of the wool, but the vapor barrier is always retained. To protect water pipes from freezing, insulation should be on the cold side whenever possible and none on the warm side, but keep vapor barrier intact. Vapor barrier must fit snugly around outlets.

(Continued from page 466)

the framing members with nailing flanges or edges of the paper or vapor barrier backing nailed to the inside edges of the studs or other framing members. When blanket insulation which is thinner than the depth of the framing members is applied entirely between the framing members, it should be installed so that two air spaces are formed. The blankets should always be cut slightly longer than the opening to be filled and the ends secured to the plates in the same manner that the edges are fastened.

One type of blanket insulation is installed between studs by first securing the upper end with a lath strip, stretching the blanket to the desired length and attaching the other end to the sill in the same manner. After this is done the edges of the blanket are fastened along the sides of the studs by stapling at regular intervals of about 18 inches.

There are a number of thin flexible insulations that can be applied directly to the studs, either on the inside or outside edges, and the interior or exterior finish applied directly.

Blanket insulations may be applied to masonry walls if the furring strips are thick enough to prevent close contact of the insulation with any rain borne moisture which might be conducted through to the inside of the masonry.

Wherever insulating blankets or batts are used with new masonry, an effective vapor barrier should be installed on the warm side of the insulation.

Some compressible types of blanket insulations can be run over the furring strips and compressed over them by the lath or other interior finish which is applied. This method is common with builders who prefabricate houses or wall panels.

BATTs OR BLANKETS should always be worked carefully around pipes and conduits. Water pipes should be protected from freezing with insulation on the cold side but the vapor barrier retained on the warm side.

IN INSTALLING batts start at the bottom of the stud space and completely insulate by snugly butting successive batts together. Where there is a flange on the vapor barrier, it should be stapled to the studs. At sills, plates and in odd-shaped places, the vapor barrier is cut a little larger than the opening, the insulation tucked back and the barrier stapled to members. Same rule applies to blankets.

IN FLOORS over crawl spaces batts can be installed in several ways. A suitable supporting material, vapor permeable, is first installed, shown as (1) in the drawing. Each joint space is completely insulated with all batts butted snugly together, worked around bridging and fitted snugly at ends of joint runs. Vapor barriers are always up, next to the floor. Flanges are stapled in positions shown in the three drawings, depending on which method is adopted. If flooring is already installed, the insulation can be applied from below with the vapor barrier up, and supported with a suitable vapor permeable material attached to the bottoms of the joists. When insulation is installed in a floor over a cold area or crawl space, good vapor barriers plus adequate ventilation will add to the efficiency of insulation and comfort.

BATTs

A number of manufacturers who produce blanket insulations also make batts, using the same raw materials. Batt insulation is 48 inches or less in length and the same widths as the blankets—15 inches to fit between studs 16 inches on center and 24 inches for the 24-inch O. C. studs. The most common thickness for batts is three inches, although they are also produced in one and two-inch thicknesses. They may be obtained with the insulation completely ensased in paper, one side of which is a vapor barrier; with the vapor barrier only on the one side; or without the integral vapor barrier. Some manufacturers provide a nailing flange as part of the vapor barrier.

Application

Work should always be started at the bottom with batts, and each stud space completely filled by snugly butting each batt against the other. Where there are pipes, conduits or other obstructions to work around, (Continued on page 470)
Insulating efficiency without bulk

... Costs less ... Perfect vapor barrier, too!

**REYNOLDS ALUMINUM REFLECTIVE INSULATION**

**TYPE B**— Embossed aluminum foil on both sides of kraft paper.

**TYPE C**— Embossed aluminum foil on one side of kraft paper.

Quickest to apply, easiest to handle! You cover 250 square feet with one 15-lb. roll... just staple the bright sheets in place. Reflects up to 95% of radiant heat from whatever direction it comes... from the sun in summer, from stove or furnace in winter. And it’s the perfect vapor barrier, too. All this, at half the cost of most bulk insulations! Write for information. Reynolds Metals Company, Building Products Division, 2003 South Ninth Street, Louisville 1, Kentucky.

In rolls of 250 sq. ft. — 25”, 33” and 36” wide.

Military needs for aluminum limit supply, but Reynolds is rapidly expanding primary capacity. Check your supplier.

REYNOLDS ALUMINUM

APRIL 1952
INSULATING BOARD

Common insulating board products used in light construction are known as building board, sheathing, lath, tile board, plank and roof insulation.

Building board is a product for general usage produced in four-foot widths and in lengths from six to 12 feet. Popular thickness is ½-inch, although it is available in thicker grades. It can be used satisfactorily with the natural finish but a number of manufacturers apply various colors to the surface at the factory. When applied, insulating board is usually the finish wall. Various decorative effects can be achieved by cutting V-joints, grooves and designs with special cutting tools.

INSULATING BOARD SHEATHING is applied by nailing to intermediate studs first with the nails about six inches apart. Nails around the edges are then spaced three inches apart.

Applications

The board can be nailed directly to studs or any solid backing. Where nailing is exposed, ½-inch board should be fastened with 1¼-inch galvanized finishing nails, cadmium plated needle point No. 17 gauge with ½-inch flat heads or No. 16 gauge brads. The finishing nails or brads should be driven at an angle and heads set flush with a nail set to avoid hammer marks. No type of nail should be set below the surface of the board. Concealed nailing can be done with ½-inch galvanized shingle nails, galvanized roofing nails or box nails. The flat-headed nails, where covered, can be driven slightly below the surface.

Nails should be about ½-inch from the edge of the board and about three inches apart around the edge. On intermediate framing members the nails can be six inches apart. All board joints should be centered on framing members.

It is always well to unpack the board and set the pieces singly about the room or structure where they are to be used about 24 hours before application for adjustment to atmospheric conditions. Even after this is done, no boards should ever be forced tightly together. A moderate contact at the joints is recommended by manufacturers. Where the board is to be painted after it is installed, the manufacturer's specifications on priming and paint to use should be followed.

Insulating board sheathing is a structural board usually heavier in weight than building board. All of the sheathing on the market today are waterproofed either with an asphalt coating or with an integral asphalt treatment. Insulating board sheathing is supplied in two main size groups—½ or ¾-inch thick, four feet wide, in lengths from eight to 12 feet with square edges, two by eight-foot sheets. ¾-inch thick, usually with some kind of tongue and groove or fitted edge joint on the long edges.

This type of insulating board can be used as regular sheathing in frame construction with the various types of exterior finishes such as wood siding, shingles, stucco or brick veneer. FHA minimum requirements do not specify building paper where insulating board sheathing is used except under stucco or masonry veneer.

INSULATING BOARD LATH is applied with the long edges at right angles to framing or furring. When small areas are to be filled out insulating lath must be used: not wood.

Commercial Building Insulations

<table>
<thead>
<tr>
<th>Insulation Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Loose Fill Insulations</td>
<td>Fibrous: Mineral wool, Rock wool, Glass wool</td>
</tr>
<tr>
<td>Insulating Board Insulations</td>
<td>Building board, Sheathing, Lath, Tileboard, Plank, Roof insulation board</td>
</tr>
<tr>
<td>Slab Insulations</td>
<td>Corkboard, Wood fiber and cement, Mineral wool with binder, Insulating board slabs, Asphalt-veermiculite slabs, Hard rubber, Cellular glass</td>
</tr>
<tr>
<td>Reflective Insulations</td>
<td>Aluminum foil, Paper backed foil, Combination of aluminum foil with other types of insulation such as blankets and structural insulation board</td>
</tr>
<tr>
<td>Miscellaneous Insulations</td>
<td>Confetti-like material sprayed on with adhesive, Combinations of aluminum foil with other types of insulation such as blankets and structural insulation board</td>
</tr>
<tr>
<td>Insulating board core surfaced on one or both sides with cement board, metal or other material, Multiple layers of corrugated paper, Cellular mass made from liquid resin</td>
<td></td>
</tr>
</tbody>
</table>

Reflective insulations, with their bright metallic reflective surfaces, differ from other types of insulation.

(Continued on page 472)
**PLASTER with PERMALITE**

Base coat plaster with lightweight Permalite aggregate adds built-in insulation... fireproofing... crack resistance... and saves up to 4 tons dead-weight in an average 5 room house. Its use means less settling and minimum maintenance, plus important fuel savings and added Winter and Summer comfort. It’s the finest wall finish you can use. These important factors make a big impression on home buyers... make them want to buy!

**CONCRETE with PERMALITE**

Concrete with Permalite aggregate gives up to 20 times more heat insulation than ordinary concrete. Use it for floor fill insulation. It screeds smooth in one operation, forms a hard surface free from flaking and provides adequate structural strength. It’s a superior base for floor radiant heating system. Permalite adds much to building quality... little to building cost.

Permalite lightweight aggregates, rigidly controlled for uniform quality, are packed in 4 cu. ft. bags. They’re convenient to store indoors, easy to handle, to mix. Meet all building code requirements. Get the full story on Permalite aggregates and how they’re being used with outstanding success in houses of all sizes. Send in the coupon today.
ceilings below an unheated attic space above unheated spaces. (A) shows it on not floored, foil may be placed on the space at least 1/4-inch deep: (C) shows typical foil reflective insulation in floors when the attic is floored. If the attic is installing foil reflective insulation in a THREE different methods of installing two layers of this foil, one of which has top of the joists, indented to form an air space at least a 1/4-inch deep. Both sides have reflective surfaces. TWB and Plaster

(Continued from page 470) because they depend entirely on their surface characteristics for insulating value. Insulation value is achieved with reflective insulations only when they face a 1/4-inch or larger air space.

Application
Reflective insulations are manufactured to be installed either between framing members or with nailing surfaces brought over the inside edges of the framing members and the reflective surface set in between the members. This type of insulation can also be installed on furring strips on masonry walls.

When foil-backed gypsum board is installed, the conventional application techniques for gypsum board are used, except that the side of the board with the foil on it must always be nailed to face the framing members or furring strips.

SLAB
Slab insulations are made of a number of materials in small, rigid units usually one inch or thicker in sizes up to 24x48 or 36x36 inches square. The general kinds are: 1—corkboard; 2—wood fiber and cement; 3—mineral wool; 4—cellular glass; 5—vegetable or wood fiber board.

In home building and light construction the slab insulations are being used at an increasing rate to retard heat loss from concrete slab floors laid directly in contact with the ground. In cold climates it is essential that the perimeter of concrete slab floors in structures designed for human occupancy, particularly houses, have adequate insulation from the foundation and from the ground, not only to avoid heat loss but to add to the comfort and health of the occupants. Forming on the room surfaces of exposed walls, floors and ceilings. Because the insulated areas, however, make the outside surfacing materials colder than those of uninsulated construction, it is especially important that the insulation be properly in-

VAPOR CONTROL
Two reasons why excessive moisture vapor is more prevalent in present day houses than in those erected a few years ago are (1) a greater number of small, basementless-type houses are being built, and (2) improvements in materials along with caulking, weather stripping, storm windows and storm doors make houses more nearly air tight. The use of thermal insulation, more widespread than ever, increases the inside surface temperatures of exposed walls, floors and ceilings, providing added physical comfort with savings in fuel. This also effectively minimizes the possibility of condensation forming on the room surfaces of exposed walls, floors and ceilings. Therefore, moisture vapor is more prevalent in present day houses than in those erected a few years ago.

IN CRAWL spaces under basementless houses condensation control can be assisted by laying roll roofing weighing at least 55 pounds per 108 square feet on the surface of the soil with edges lapped at least two inches. Covers of this kind greatly restrict the evaporation of water and somewhat less ventilation is required then when no covers are used. Crawl space ventilation should be placed in the corners and as high as possible in the walls or foundation. The minimum number of ventilators recommended is four with one near each of the corners installed, along with whatever collateral materials or means which will prevent the passage of excessive moisture vapor to these cold exterior surfaces.

Moisture vapor in a house is beneficial and necessary, but it must be controlled through proper application of moisture barriers and ventilation. Moisture sources may be many and will vary with types of construction, climate, weather changes and living habits of occupants of the house. Usually moisture sources come under these three classifications: (1) Moisture due to soil or structural conditions; (2) Moisture-creating equipment and living habits in the home; (3) Tightness of construction, without allowance for the escape of excess moisture vapor.

Application
Basement moisture sources can be minimized by the following corrective measures:

1. Install adequate drainage tile at the foundation footings, with drain into dry well.
2. Waterproof foundation walls and concrete floor according to recommendations of the Portland Cement Association.

(Continued on page 474)
Here's the only rock wool batt that can guarantee year 'round comfort and top fuel economy — plus greater fire-safety for all types of structures! Carey Fire-Guard rock wool batts feature an exclusive Carey development — a vapor barrier that resists fire, doesn't feed it! They are the only rock wool batts with Underwriters' Laboratories, Inc. highest fire-protective rating!

Other client-pleasing advantages of Carey Fire-Guard batts include resistance to moisture, vermin, decay; high thermal efficiency and excellent noise absorption characteristics. With Carey Fire-Guard batts, installation proceeds with cost-cutting speed and ease. Firmly-felted, easy to handle Fire-Guard batts come in full-thick and semithick sizes that fit snugly between standard framing members.

Let the plain, hard facts be your guide to insulation value. Be sure Fire-Guard rock wool batts are in the specifications for your jobs. Carey dealers stock Fire-Guard batts for immediate delivery.

Mail coupon today for FREE Samples of Carey Fire-Guard and informative literature

THE PHILIP CAREY MFG. CO.
Lockland, Cincinnati 15, Ohio
Department AB-4

Please send me a FREE sample of Carey Fire-Guard rock wool batts and informative literature.

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ADDRESS
CITY ZONE STATE

The Philip Carey Mfg. Company, Lockland, Cincinnati 15, Ohio
In Canada: The Philip Carey Co., Ltd., 277 Duke St., Montreal 3, P. Q.
3. Install bituminous joints between the concrete floor and the foundation with a waterproof membrane under the concrete floor.

4. Install a drain in the concrete floor, sloping the floor to the drain.

5. Install adequate gutters and downspouts that drain to storm sewers or well away from the foundation.

**IN THIS method of construction a vapor barrier is recommended between the subflooring and the finish floor, with cold or lower side of the floor left permeable. Blanket, batt or loose fill insulation is shown supported on wire cloth and wood slats nailed to the joists. Note the corner pack. This must be installed so it will remain permanently in place. Where these corner packs are used it is especially important that the crawl space be well ventilated and that soil covers as shown at the left be used in damp locations to prevent condensation on the sill.

6. Make certain the chimney is of adequate size.

7. Ventilate the basement in dry weather.

*Moisture from crawl spaces under first floors usually amounts to more than that from any other source.* Good practice in condensation control in crawl spaces includes the following:

1. At least four ventilating openings, with one near each corner of the building. Placed high.

2. Do not close ventilation any time during the year.

3. Stopping the moisture from the ground from entering the air in the confined space by covering the ground with a vapor-resistant durable material. A good water-proofed concrete slab or heavy roof rolling has been shown to be effective. A roll roofing, either mineral surfaced or plain, weighing at least 55 pounds per 100 square feet, laid with 2-inch lapped joints over a rough-graded surface, may be expected to serve satisfactorily for many years.

The fault lies in lack of control of moisture vapor, lack of good ventilating practices, and failure to eliminate stubborn sources of moisture.
BUILDERS REVEAL SECRETS
of New Ways to Insulate and Plaster,
Get Better Results, Cut Time and Cost

RADIANT HEATING SPECIALIST FINDS INSULATING CONCRETE INCREASES EFFICIENCY!

CRYSTAL LAKE, ILL., Nov. 5, 1950 — More than 300 floor panel radiant heating installations have taught Miles Westbrook, local heating contractor, some interesting facts about insulation. As a result of his experience, he specifies that a layer of Zonolite Insulating Concrete must be laid over the levelled ground before radiant heating coils are installed. Says Mr. Westbrook, "Heat loss to the earth from a floor slab without insulating concrete is usually high. Zonolite Insulating Concrete keeps heat from going downward and, over a period of time, saves a good deal of fuel."

Mr. Westbrook adds, "Over several seasons, we have found in homes where floor coils were laid over Zonolite Insulating Concrete, that over-ride and lag were much less of a problem... than when coils were laid over cinders or other insulations. Also... panels without a Zonolite insulating base needed much higher water temperatures to maintain comfort."

Veteran Contractor Tells How He Does Better Plastering with Zonolite!

CINCINNATI, OHIO, Nov. 15, 1950 — C. W. Sittason, local contractor who has been in the plastering business for over 29 years, has found that he can eliminate many plastering difficulties by using Zonolite Plaster Aggregate. After using Zonolite plaster on a large Cincinnati ceiling job he said, "Zonolite plaster adhered to the base coat better... drop-outs and over-night laps gave no trouble... screeding alone produced a finish that looked like troweling!" He also found his men showed great enthusiasm in working with Zonolite.

Mr. Sittason himself enthusiastically states, "I heartily recommend Zonolite Plaster Aggregate and Zonolite Acoustical Plastic to improve the quality of any plastering job!"

House completely insulated in 2 hours!

SIOUX FALLS, SOUTH DAKOTA, Oct. 10—Robert Stoneall, local building contractor, reveals his unique use of Zonolite Vermiculite Insulation to completely insulate a home in only 2 hours with just 2 men— including time spent unloading bags and cleaning up after the job is finished! His time and money-saving method enables him to complete side-wall and attic insulation in a 24' x 30' house in a fraction of the normal time. Mr. Stoneall says, "You can't beat ZONOLITE for insulation and ease of installation."

This is Stoneall's method: By putting the 2 x 4 plates on top of the ceiling joists, he leaves access in the attic so that ZONOLITE may be poured down the sidewalls from the top. Sidewalls are poured first. The light granular nature of the material permits it to run freely between the studding, all the way to the foundation, filling the space to a uniform thickness. The wall is vibrated lightly with a rubber mallet to produce settlement. Spaces under window openings are filled after the lath is installed.

When sidewalls are full, the remaining bags of ZONOLITE are dumped in the center of the attic, then raked and leveled between the joists to a 3/4 in. thickness.

ZONOLITE COMPANY, 135 S. LaSalle St., Chicago 3, Ill., Dept. AB-42

PUT NEW TIME AND LABOR SAVING ZONOLITE INSULATION TO WORK FOR YOU! GET FULL DETAILS TODAY!

Zonolite is a registered trade mark

Zonolite Company, 135 S. LaSalle St., Dept. AB-42
Chicago 3, Illinois

Please send me booklet G-24 on Zonolite products, including Zonolite Insulating Fill.
Name:
Address:
City State
**Tons of THORO System Materials used by George Sheaf & Co.**

Birdseye view of Franklin County Children's Home, in Columbus, Ohio. All exterior foundation walls given two coats of THOROSEAL. All interior foundation walls given one coat of THOROSEAL and one coat of QUICKSEAL. Specified by Inscho, Brand, & Inscho, Columbus, Ohio.

40 Years of service

This year marks our 40th year in the manufacturing of high quality masonry materials. Today, from coast to coast, the name “THORO System products” is high on the list of specified materials by leading architects, engineers and contractors who, themselves, have achieved fame by recognition of good products.

Wilberforce State College, Wilberforce, Ohio. All interior exposed black walls and ceilings received one coat of THOROSEAL (Base Coat).

QUICKSEAL (Finish Coat) was used to provide final protection and beauty, with the wide variety of colors meeting all decorative requirements.

Get our 20 page brochure pictorially described in detail, “How to Do it.”

Standard Dry Wall Products
NEW EAGLE, PENNSYLVANIA

---

Dear Mr. Saunders:

For several years now, we have been using your THORO SYSTEM products in the construction of our buildings. We have found them to be excellent in every way and have always been satisfied with the results. We would like to express our appreciation for your continued support and the excellent service you have provided to us.

We have used THOROSEAL, applied in two brush coats as per your specification, as an exterior foundation coat and have found it to be both effective and easy to apply. It provides a good base for the subsequent coats of finish.

We have used THOROSEAL and QUICKSEAL, applied in one brush coat as per your specification, as an exterior foundation coat and have found it to be both effective and easy to apply. It provides a good base for the subsequent coats of finish.

We have also enjoyed excellent relations with your distributor in Wilberforce, The Colonial Builders Supply Company, and found them to be very helpful and responsive whenever we have required assistance.

In the past we have used many types of THOROSEAL and QUICKSEAL in various applications and have always been satisfied with the results. We would like to express our appreciation for your continued support and the excellent service you have provided to us.

Sincerely,

George Sheaf & Co.

September 6th, 1952

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AMERICAN BUILDER
CONCRETE—made by mixing cement with water and coarse or fine aggregates—has taken its place today as one of the most widely used materials in house construction. Although concrete is used in some way in every house, a concrete house is considered one which has concrete foundations, floors, walls, and a fire-safe roof. A concrete house will either be of poured reinforced concrete or of concrete masonry. The uses of concrete and concrete masonry for foundations, floors, decks, and walls are part of the fundamental techniques of every builder. New applications for existing products, new materials, and new methods are extending the uses of concrete in the small homes and light construction field.

CEMENT PRODUCTION

Portland cement consists of limestone, clay or shale, gypsum, iron oxide, and other possible admixtures. The basic ingredients are quarried, crushed, dried, blended, and ground to a fine powder called "raw mix." This mix is further blended for complete uniformity of product, and carried to a kiln. In the cement kiln, which is a long rotating cylinder blower fired at one end, the mix is burned to a partial fusion at about 2700 degrees F. It emerges and is cooled, forming a glassy, clinker resembling pebbles.

About 3% per cent gypsum is added to the clinker, to control the rate of hardening of the cement, and the mixture is finish ground to cement in tube mills. The result is a powder so fine that it will pass through sieves which will hold water. The finished cement is conveyed to silo-like storage tanks.

From storage, the finished cement is either loaded into bulk cars or packed into bags. It is of interest to note that the bags are filled after being sewn shut; the cement is put in the bags by a fine nozzle which is automatically shut off when the correct weight is reached. Although the standard unit for cement is the barrel, this type of container is obsolete and no longer in use. The standard bag of cement contains 94 pounds, which approximates one cubic foot.

SPECIAL TYPES OF CEMENT

In addition to the basic portland cement which serves most of the needs of the construction industry, there are many special types for applications where specific properties are needed. High early strength cement permits concrete to be placed in service and forms stripped more quickly. High sulfate-resisting cement is used widely in the West where excessive sulfate chemicals are present in the air and soil.

Air-Entraining Cements

Air-entraining cements contain small amounts of soap-like or fatty ingredients ground up with the normal clinker. Concrete made with these cements, or with other air-entraining agents introduced on the job under careful control, contains billions of microscopic air cells throughout each cubic foot of concrete. These relieve internal pressure on the concrete by providing tiny chambers for the expansion of water when it freezes.

Air-entraining cements were first developed for highway concrete to combat the scaling action of the calcium and sodium chlorides which are used to melt ice. The microscopic air cells produce a concrete which is highly resistant to cycles of freezing and thawing, wetting and drying, and frost action, and also has a remarkably high degree of durability and
workability. Air-entrained concrete with normal aggregates is from three to six per cent lighter in weight than otherwise. There may be some loss in strength with normal cement-water ratios, which require slightly more aggregate. This may be offset by increasing the amount of cement per cubic yard. Air-entrained concrete has less slump than regular concrete. Because there is no difference in price between regular and air-entraining cement, the latter is steadily advancing in popularity with builders. Other special types of cement are white cement, which is a portland cement made of selected raw materials and by processes which will introduce no color, staining, or darkening of the finished product. Waterproof portland cement is made by grinding water-repellent materials with the clinker from which it is made.

Refractory Cement

Refractory cement is not a true portland cement, but is a calcium-aluminate hydraulic cement having many properties unlike portland cement. Refractory cement make possible the use of concrete for many purposes and conditions where ordinary concrete is unsuitable, such as for furnace and kiln linings and chimneys. Refractory aggregates, such as crushed salvage firebrick, must be used in such mixtures.

The cement used by the Romans in ancient times was a volcanic rock of alkaline silico-aluminate composition, called pozzolana. This cement formed a very stable concrete due to a chemical reaction between the free lime and the pozzolana. Similar characteristics are found in fly ash, and research is under way at the present time to determine the effects of the addition of fly ash to cement. Fly ash, suitably treated with alkalines and combined with portland cement produces a concrete of greater compressive strength and sulfate resistance than is obtained by other cements, on the basis of present tests.

AGGREGATES

The inert materials such as sand, pebbles, or crushed stone that are mixed with cement and water to make concrete are known as aggregates. Although they are usually considered as inert materials acting as fillers, the aggregates compose some 66 to 78 per cent of the concrete by volume. Aggregates must be clean, free of clay, dirt, coal, silt or other matter which would inhibit proper coating by and bonding with the cement paste.

Both fine aggregates, such as sand, and coarse aggregates, like gravel, should meet the requirements of “Standard Specifications for Concrete Aggregates,” ASTM Designation C33. Generally speaking, sand and gravel supplied to the builder by local materials dealers are of good quality. Bank run gravel, the mixture of sand and pebbles taken from the bank or pit without screening, usually has a higher percentage of sand than is required for a correct mix, and the proportion may vary greatly throughout different parts of the bank. If it is desired to use bank run gravel because of its ready availability, it should be screened through a ½-inch mesh, and the sand and pebbles thus separated combined in correct amounts in the concrete.

Refractory aggregates in addition to sand and gravel, other materials used as aggregates in concrete include cinders, blast fur-

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### SUGGESTED PROPORTIONS OF WATER TO CEMENT

<table>
<thead>
<tr>
<th>Kind of Work</th>
<th>U. S. gallons of water to add to each 1-sack batch</th>
<th>Trial mixture for first batch</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Damp sand Wet sand Very wet sand Cement, sacks, cu.ft. Sand, cu.ft. Crushed aggregate stone, cu.ft. size, inches</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>(Average sand)</th>
<th>4/5</th>
<th>5/4</th>
<th>3/4</th>
<th>2/4</th>
<th>1 1/4</th>
<th>3/4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Foundation walls which need not be watertight; footings for walls, columns and chimneys; retaining walls, garden walls.</td>
<td>6 1/4</td>
<td>5 1/2</td>
<td>4 7/8</td>
<td>1</td>
<td>2 1/4</td>
<td>4</td>
<td>1 1/2</td>
</tr>
<tr>
<td>Watertight basement walls, walls above ground, driveways, walks, floors on ground, basement floors, porch floors, paved terraces, concrete steps.</td>
<td>(Average sand)</td>
<td>5 1/4</td>
<td>5</td>
<td>4 3/4</td>
<td>1</td>
<td>2 1/4</td>
<td>3</td>
</tr>
<tr>
<td>Suspended reinforced concrete floors of all types; reinforced concrete posts and columns, sills, lintels.</td>
<td>(Average sand)</td>
<td>5 1/4</td>
<td>5</td>
<td>4 3/4</td>
<td>1</td>
<td>2 1/4</td>
<td>3</td>
</tr>
</tbody>
</table>
nace slag, burnt clay, pumice, and expanded vermiculite. Cinder concrete is made of cinders, cement, and water; or cinders, sand, cement, and water. In order to be suitable for concrete, cinders should be hard-burned boiler cinders, free from fine ash, and with a combustible content of not more than 35 per cent by weight. Household ashes are too fine and powdery and should never be used.

Cinder concrete is used for certain classes of work such as roof saddles, floors not designed for carrying heavy loads, and the manufacture of cinder blocks. The value of cinder concrete is chiefly in its light weight.

Blast furnace slag has found an increasing use as a coarse aggregate for concrete. The slag particles are extremely hard, and because of their pitted surfaces are firmly held in the matrix of cement and sand. Generally, blast furnace slag for concrete work should have a weight of 65 pounds per cubic foot or more, depending on the abrasion to which the concrete is subjected.

**Lightweight Aggregates**

Concrete made with the usual types of aggregates weighs on the average about 150 pounds per cubic foot. Concrete of a lighter weight can be produced by the use of an admixture which causes swelling of the mix, or by the use of lightweight aggregates. The admixture has been used chiefly for floor and roof fills, giving a concrete weighing about 50 pounds per cubic foot. The strength of such concrete is less than that of normal concrete, but in such uses strength is not an important factor. With admixtures, the swelling occurs after the concrete is placed, so that allowance must be made for the increase in volume.

Lightweight aggregates are used in some structural concrete and in precast units such as concrete masonry, floor joists, and precast roof slabs. Burnt clay, expanded blast furnace slag, pumice, and expanded vermiculite are some of the materials used. Sand is often added as a fine aggregate to improve the workability of the mix. Concrete weights of from 40 to 110 pounds per cubic foot are obtained, depending on the type of aggregate and the use for the concrete. Higher cement factors are required for given consistency and strength with lightweight aggregates than for concrete using ordinary aggregates.

Lightweight aggregates are porous and must be wet thoroughly before being used. A larger proportion of

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**Five Different Ways for Placing Concrete**

On this page are five approved methods for placing concrete, each the best one available for a particular job. Clockwise, from top to bottom: the hand-mixed, shoveled-in-place technique is still best and most economical for small placements. The wheelbarrow carries most of the poured concrete to its final place, although the convenience of ready-mix trucks shown in the next photo has taken over much of the wheelbarrow's work. Hoists and chutes are economical for larger jobs; the adjoining photo shows concrete being pumped at a large Indiana housing project.
Heating of materials is necessary for cold-weather mixing and pouring of concrete. A fire in a large pipe keeps aggregates heated.

Fine aggregates is generally required, because of the rough surfaces and irregular shapes of light aggregate particles.

Lightweight aggregates should be obtained from reliable dealers and producers equipped to supply a uniform, dependable product. Since there is a considerable variation between the different types of lightweight aggregates, the user must rely on the data supplied by the producer for his product only, and should also follow manufacturer's recommendations carefully for best results.

STRUCTURAL CONCRETE

Concrete consists of hard aggregates held together by a hardened paste. This paste is the determining factor in forming the qualities of the concrete, if the aggregates themselves are adequate. The paste is a mixture of portland cement and water, and hardens following the chemical reaction known as hydration. It is always necessary to use more water than is needed for hydration in order to provide workability of the mixture. Typically, the cement-water paste will constitute 23 to 34 per cent of the total concrete by volume, of which 7 to 14 per cent is cement and 15 to 20 per cent water. Aggregates take from 66 to 68 per cent of volume.

Water used for mixing concrete should be free of acids, alkalis, or oils. Any water which is suitable for drinking may be used for concrete mixing unless abnormal quantities of sulphates are present.

Design of Concrete Mixtures

Concrete mixtures should be designed to give the most economical and practical combination of materials which will produce the necessary workability in the fresh concrete, and the required qualities in the hardened concrete. The different factors entering into the precise calculation of optimum amounts of cement, water, and aggregates are too detailed to enter into here; a comprehensive outline is given in the booklet "Design and Control of Concrete Mixtures," available from The Portland Cement Association, 33 W. Grand Ave., Chicago, 10, Illinois. Suggested concrete mixes for different types of home construction are shown in the adjoining table as a guide, which may be modified as local conditions and experience dictate.

Measuring Aggregates

Quality concrete begins with the accurate measurement of the ingredients. Haphazard division of sacks is an inadequate method for measuring cement, and batches of at least one-bag size should be mixed if practical. On small jobs, weighing may be efficiently accomplished on a platform scales set on the ground with runways at either side so that wheelbarrows may be run on and off. When several wheelbarrows are used on the same scales, they should be weighted so that they all have the same tare. The men soon become skilled at filling the wheelbarrows so that very little need be added or taken off to give the correct weight.

Measuring Cement

If bagged cement is used, mix in full bag units. On jobs requiring less than full bag mixes, it is better to weigh the cement rather than divide a bag by volume. On large-scale proj-
ONE of the most outstanding characteristics of Brixment is its plasticity. Its working qualities are comparable to those of lime putty. Because of this unusual plasticity, a bag of Brixment will carry three full cubic feet of sand, and still make good workable mortar....

This exceptional workability makes it easy for the bricklayer to secure neat, clean brickwork, with the brick properly bedded and the joints well filled. The final result is a better job, at lower cost.
ects where bulk cement is used, a springless scale for weighing cement is the most accurate and efficient method.

**Measuring Water**

Because of the importance of the correct amount of water, accurate and dependable means for measuring the mixing water are essential. Portable mixers are generally equipped with water tanks and measuring devices that are reasonably accurate when properly used. The horizontal tanks used on mixers some years ago cannot be depended on for accuracy; the vertical ones on newer mixers are more accurate. For small projects, a bucket may be calibrated and marked.

**Mixing the Concrete**

In mixing, it is important to get all the particles of the aggregate thoroughly coated with the cement paste. The time required for thorough mixing depends on several factors. Specifications usually require a minimum of one-minute mixing for mixers up to a one-yard capacity, with an increase of 15 seconds mixing time for each additional half-yard or part thereof. The mixing period should be measured from the time all the solid materials are in the mixing drum, provided all the water has been added before one-fourth the mixing time has elapsed. The steps for most efficient charging of the concrete mixer are as follows:

1. Add about 10 per cent of the water to be used.
2. While allowing the water to run, add the aggregate.
3. Add the cement.
4. Add the last 10 per cent of the water.

After mixing for the correct time on the basis of the size of the mixer, the concrete must be discharged and placed promptly. One and a half hours is the maximum time that may elapse before pouring, without seriously affecting the characteristics of the finished concrete. The initial set takes place within two or three hours, and water should not be added to rework mixtures.

**Mixer Operation**

Mixers should not be loaded above their rated capacity, nor at greater than recommended speeds. If additional output is needed, it should be obtained with additional or larger mixers, not by overloading or speeding up the equipment on hand. If the blades of the mixer become worn or coated with concrete, the mixing action will be less efficient. Badly worn blades should be replaced, and the mixer cleaned after each day's work. Any hardened concrete should be removed before proceeding with fresh mixing.

**Handling and Transporting Concrete**

Each step in handling, transporting, and placing concrete should be carefully controlled to maintain uniformity through the batch and from one batch to another, so that the completed structure will be of uniform quality throughout. It is essential to avoid separation of the coarse aggregates from the cement-water-fine aggregates paste, or separation of the water from the other ingredients. Segregation at the point of discharge from the mixer can be avoided by providing a down pipe at the end of the chute so that the concrete will drop vertically into the receiving hopper, buggy, or wheelbarrow.

Slabs of prestressed concrete make the 8-foot overhang of the eaves possible here.
Use Trinity white—the whitest white portland cement. It gives extra
eye-appeal to... architectural concrete units... stucco... terrazzo... cement paint.

Trinity has many special uses because of its beauty and light-reflective
properties. Trinity white is a true portland cement that meets all Federal and ASTM specifications.

General Portland Cement Co., 111 W. Monroe St., Chicago; Republic Bank Bldg., Dallas;
816 W. 5th St., Los Angeles; 305 Morgan St., Tampa; Volunteer Bldg., Chattanooga.
Pneumatically applied concrete is successfully used both on new construction and for repairing old concrete which has deteriorated.

(Continued from page 482)

and are designed for easy dumping and rapid discharge. Runways should be smooth and fairly rigid to minimize any tendency to segregate.

Placing Concrete

The first essential in the placing of the mixed concrete is the preparation of the forms, exposed surfaces, and sub-grade. Sub-grade should be trimmed to the required level. Low spots should be filled and tamped. The sub-grade should be moistened to minimize extraction of the water from the concrete. This is especially important in pouring pavements, floors, and other slab work in hot weather. All loose material should be cleaned out.

Forms should be well braced, tight, clean, and of a material suitable for the texture of the finished concrete. Nails, sawdust, and other debris should be cleaned out. Forms should either be oiled or saturated with water to reduce water absorption and facilitate removal after the concrete has set. Plywood forms are frequently lacquered instead of being wetted or oiled. Reinforcing steel should be clean and free of loose rust or mill scale.

When placing new concrete against old or hardened concrete, it is necessary to secure both a good bond and a watertight joint. The hardened concrete should be clean, rough, and moistened. Some of the aggregate particles should be exposed.

On floor slabs to be built in two courses, the top of the lower surface should be brushed, just before it sets, with a stiff fibre or steel broom. It must then be protected and thoroughly cleaned before the second course is placed. Old concrete that is to be bonded to new concrete in patch or alteration work must be thoroughly roughened and cleaned. In most cases it is necessary to chip off the entire old surface to get a satisfactory bond.

When pouring the second course of a two-course floor, a coat of cement and water paste of the consistency of thick paint should be brushed on before the second course is placed. New concrete poured on rock or hardened concrete should be preceded by a cushion of cement mortar to prevent stone pockets and to secure a tight joint. Surfaces on which fresh concrete is placed should be thoroughly wet, but there should not be any pools of water.

In slab construction, placing should start at the far end, against concrete already in place. The mixture should not be dumped in separate piles, but should be placed as nearly as possible in final position. If the coarse aggregate has settled out, it should be redistributed. In walls, the first batches should be placed at opposite ends and additional concrete worked towards the middle of the wall. In large open slabs or areas, the perimeter should be placed first. In all cases the procedure should be such as to prevent water from collecting at the corners and ends of forms, and along form faces.

In pouring high walls or columns, the forms should be filled to within a foot of the top, at intervals of not more than six feet and in layers of about a foot thickness. The placed concrete is allowed to settle for one or two hours before the final foot is placed. When it is placed, it should be spaded, compacted, and straight-edged. Steel troweling should be delayed as much as possible and held to a minimum.

Because there is a measurable expansion of concrete with increases in temperature, it is necessary to provide expansion joints in some structures. Butt strips, metal, asphalt-treated felt, and other devices are used for this purpose.

Precast joints offer the advantages of strength, economy, and fire resistance.

Concrete Vibration

Vibration does not make concrete stronger, more water-tight, or more resistant to deleterious forces. It does, however, permit the use of stiffer, harsher mixes. Thus, either mixes of a lower water content or leaner mixes can be used. If less water is used, the concrete will be of better quality; if a leaner mix is used, the concrete will be more economical. Vibration is also of assistance in avoiding the difficulties from mixes that are too wet and tend to bleed and segregate. Thus better surfaces and better construction joints are produced.

Vibrators should not be used to move concrete long distances horizontally in the form. The concrete should be deposited as near the final location as possible, distributed in layers, and then vibrated. Some hand spading and puddling may be necessary to secure smooth finishes and reduce pitting on formed surfaces.

Vibrators may be powered by electric motor, gasoline engine, or compressed air. Both internal and external vibrators are used; the most common type is an internal vibrator consisting of a driving motor or engine and a long flexible shaft terminated by a vibrating element which is thrust into the concrete.

Internal vibrators should be inserted in a vertical position at intervals of 18 inches or so, depending on the type of equipment and the character of the mixed concrete. Spacing should be such that there is some overlapping of the area vibrated at each insertion. The vibrator should fully penetrate the concrete being placed, and may go into the layer below if the previously placed concrete becomes plastic under vibratory action. However, if the lower layer has stood for some time, penetration of this layer by the vibrator may cause a wavy line on the exposed surface at the junction of the two layers; this may be undesirable from the standpoint of appearance.

Steel reinforcing rods are used to increase the tensile strength of concrete. Note how the concrete is placed under the rods so that the reinforcing is embedded in the concrete. Rods should be at least 3/4-inch from the surface.

AMERICAN BUILDER
Typical Hollow Concrete Masonry Units

The nominal face size of units shown below and the nominal thickness of units are 2, 4, 6, 8, 10 and 12 in. Units, all manufactured to allow for 1/8" or 1/16" mortar joints. In some areas the nominal face size units are 8" x 8" x 16". Designers should consult local sources of supply to determine dimensions of units available.

Three Core—8" x 8" x 16"  Also 10" & 12" Widths  Also Half Units

Two Core 8" x 8" x 16"  Also 8" x 6" or 4" x 16"

8" x 8" x 12"  Also Half Units

5/8" x 8" x 12"  Also Half Units (Height May Vary)

Types of Concrete Wall Units—Stretchers

Corner Unit  Also Half Unit

Header Unit

Pier or Double Corner Unit

Wood and Steel Sash Jamb Units  Also Half Units

Standard Specials for 8" Units Also Made in Two Types

Similar Specials Are Regularly Furnished For 10" & 12" Units

Suggested Proportions of Water to Cement for Various Kinds of Concrete Work and Trial Mixes

<table>
<thead>
<tr>
<th>KINDS OF WORK</th>
<th>Add U.S. gal. of water to each sack</th>
<th>Trial mixture</th>
<th>Materials per cu yd. of Concrete*</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>* batch if sand is</td>
<td>Cement</td>
<td>Aggregates</td>
</tr>
<tr>
<td></td>
<td>Very</td>
<td>Wet</td>
<td>Damp</td>
</tr>
<tr>
<td>5-GAL. PASTE FOR CONCRETE Subjected TO SEVERE WEAR, WEATHER OR WEAK ACID AND ALKALI SOLUTIONS</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Toppings for two-course work. One-course industrial, creamery and dairy plant floors. Thin sections of dense, strong concrete.</td>
<td>3 1/2</td>
<td>4</td>
<td>4 1/2</td>
</tr>
<tr>
<td>Maximum size 11/2 in.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6-GAL. PASTE FOR CONCRETE TO BE WATERTIGHT OR Subjected TO MODERATE WEAR AND WEATHER</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Watertight floors such as industrial plant, dairy barn, basement, etc.</td>
<td>4 1/2</td>
<td>5</td>
<td>5 1/2</td>
</tr>
<tr>
<td>Maximum size 1 1/2 in.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Watertight basement walls. All watertight concrete for storage tanks, septic tanks, swimming pools, etc. Concrete subjected to moderate wear or frost action such as walks, driveways, tennis courts, etc. Reinforced structural beams, columns, slabs, etc.</td>
<td>4</td>
<td>4 1/2</td>
<td>5 1/2</td>
</tr>
<tr>
<td>Maximum size 3 1/2 in.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7-GAL. PASTE FOR CONCRETE NOT Subjected TO WEAR, WEATHER OR WATER</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Foundation walls, footings, mass concrete, etc.</td>
<td>5</td>
<td>5 1/2</td>
<td>6 1/2</td>
</tr>
<tr>
<td>Maximum size 1 1/2 in.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4 1/2</td>
<td>5</td>
<td>5 1/2</td>
<td></td>
</tr>
<tr>
<td>Maximum size 3 1/4 in.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4 1/2</td>
<td>5</td>
<td>5 1/2</td>
<td></td>
</tr>
<tr>
<td>Maximum size 3 1/2 in.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Quantities are estimated on wet aggregates, using trial mixes and medium consistencies (5-in. slump). Quantities will vary according to grading of aggregate and consistency of mix. Change proportions of fine and coarse aggregate slightly if necessary to get a workable mix. Quantities are approximate. No allowance has been made for waste.

NOTE: If concrete aggregates are sold in your locality by weight, you may assume for estimating purposes that a ton contains approximately 22 cu ft of sand or crushed stone; or about 20 cu ft of gravel. For information on local aggregates consult your building material dealer.

April 1952
### Physical Requirements For Various Types of Concrete Masonry Units

<table>
<thead>
<tr>
<th>Specification, serial designation, and latest revised date</th>
<th>Minimum face-shell thickness, in.</th>
<th>Compressive strength, minimum, psi, average gross area</th>
<th>Water absorption, maximum, lb. per cu.ft. of concrete, average of 5 units</th>
<th>Moisture content, maximum, per cent of total absorption, average of 5 units</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hollow load-bearing concrete masonry units ASTM C90, 1944</td>
<td>1 1/4 or over:</td>
<td>1000</td>
<td>800</td>
<td>15</td>
</tr>
<tr>
<td></td>
<td>Grade A:</td>
<td>700</td>
<td>600</td>
<td>—</td>
</tr>
<tr>
<td></td>
<td>Grade B:</td>
<td>1000</td>
<td>800</td>
<td>15</td>
</tr>
<tr>
<td></td>
<td>Under 1 1/4 and over 1 1/2</td>
<td>350</td>
<td>300</td>
<td>—</td>
</tr>
<tr>
<td>Hollow non-load-bearing concrete masonry units ASTM C129, 1939</td>
<td>Not less than 1 1/2</td>
<td>1800</td>
<td>1600</td>
<td>15</td>
</tr>
<tr>
<td>Solid load-bearing concrete masonry units ASTM C145, 1940</td>
<td>Grade A</td>
<td>1200</td>
<td>1000</td>
<td>15</td>
</tr>
<tr>
<td></td>
<td>Grade B</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Concrete units; masonry, hollow Federal S5-C-621, 1935</td>
<td>Load-bearing units</td>
<td>1 1/4 or more</td>
<td>700</td>
<td>600</td>
</tr>
<tr>
<td></td>
<td>1/2 to 1 1/4</td>
<td>1000</td>
<td>800</td>
<td>16</td>
</tr>
<tr>
<td></td>
<td>Non-load-bearing units</td>
<td>Not less than 1 1/2</td>
<td>350</td>
<td>—</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Concrete building brick ASTM C55, 1937</th>
<th>Compressive strength, minimum, psi, average gross area (brick flatwise)</th>
<th>Modulus of rupture, minimum, psi, (brick flatwise)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Average of 5 brick</td>
<td>Individual</td>
</tr>
<tr>
<td>Concrete building brick ASTM C55, 1937</td>
<td>—</td>
<td>2500</td>
</tr>
<tr>
<td></td>
<td>Grade A</td>
<td>1250</td>
</tr>
</tbody>
</table>

*For use in exterior walls below grade, and for unprotected exterior walls above grade.

**For general use above grade where protected from the weather with two coats of portland cement paint or other satisfactory waterproofing treatment approved by the purchaser.

***Units with 75 per cent or more net area. The classification is based on strength and does not necessarily measure weather resistance.

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Precautions should be taken not to vibrate so much that segregation of the aggregates takes place. This may happen especially with concrete that is warmer than is necessary. Correct operation of the vibrator requires judgment by the operator to be sure that complete consolidation of the concrete is effected, and that no areas are missed, without causing any segregation. Sufficient vibration is usually indicated by submerging of the coarse aggregate particles, and the appearance of a line of mortar along the forms.

### Concrete Forms

The general requirements for concrete forms are that they be strong, well braced, have little leakage, and be easily removed. The choice of form materials depends on the surface of exposed concrete desired. Wood forms are readily and cheaply made of tongue and groove sheathing, with 2 by 4's for studs and stringers.

Forms are more readily handled and removed when constructed in sections. Oiling the forms prevents adhesion of the concrete and makes removal easier. If the concrete surface is to be painted, paint and oil for the form must be selected that is suitable for such work. Paraffin oil diluted with kerosene or benzene is a generally satisfactory oil for surfaces of forms which will later be painted.

Special grades of plywood for form use in one-half and three-quarter inch thicknesses are available for builders, in sizes up to 4 by 8 feet. There is also a special plastic surfaced plywood which reduces absorption and provides a very smooth finish. Plywood forms can be re-used many times, and are especially adapted to projects where many buildings of the same style are erected.

Manufactured form panels, form ties, and form-clamping devices offer time-and-labor-saving advantages to the builder. Form panels are available in sizes from about 2 by 4 feet up to 4 by 8 feet. These are used in conjunction with a variety of connecting bolts, tie holders, etc. Both plywood and metal ready-made forms are available. Aluminum and magnesium form panels are light in weight, and because of their precision construction leave smooth surfaces requiring little or no rubbing or finishing. Plywood forms having a magnesium strip around the edges do not chip in use or handling.

Wood, plywood, pressed wood fibre or other forms which are absorbent should be thoroughly wet before using so that water will not be absorbed from the concrete. This will also apply to earth footing sub-grade, or to earth used as a form wall. It is practical to use earth as a form wall provided there is no danger of the dirt being mixed into the concrete. If it is used, spading should be done carefully.

(Continued on page 488)
is made with

DURAPLASTIC*,
the cement that gives a more workable mix
yet costs no more

High atop a 100-foot grain elevator in Grand Forks, N. D., the concrete walls of this one-story building were cast flat—then tilted up into position. For this new technique, the builders specified a time-tested material—Atlas Duraplastic air-entraining portland cement.

They already had proof of Duraplastic's performance—because the elevator below was also Duraplastic-made! The increased plasticity and cohesiveness of Duraplastic concrete, which aids proper placement and helps to improve surface appearance, resulted in this neat slip-form job.

For more than a decade, Duraplastic has made better concrete for all types of structural jobs. Yet it sells at the same price as regular cement and requires no unusual changes in procedure. Complies with ASTM and Federal Specifications. For descriptive booklet, write Universal Atlas Cement Company (United States Steel Corporation Subsidiary), 100 Park Avenue, New York 17, N. Y.

**"Duraplastic" is the registered trade mark of the air-entraining portland cement manufactured by Universal Atlas Cement Company**

ARTIS DURAPLASTIC
AIR-ENTRAINING PORTLAND CEMENT

Makes Better Concrete at No Extra Cost

"THEATRE GUILD ON THE AIR"—Sponsored by U. S. Steel Subsidiaries—Sunday Evenings—NBC Network

APRIL 1952

DURABLE JOB—Water gain and segregation are minimized by Duraplastic's air-entrainment feature, and resulting concrete is fortified against the effects of freezing-thawing weather.

THE MIX SHOWS—There's an important difference when the mix is made with Duraplastic cement. Less mixing water is required for a given slump, yet the concrete is more plastic, more uniform and easy to place.

OFFICES:
Albany, Birmingham, Boston, Chicago, Dayton, Kansas City, Minneapolis, New York, Philadelphia, Pittsburgh, St. Louis, Waan.
Concrete Curing and Protection

After the concrete has been placed, the chemical process of hydration of the cement occurs. The initial curing reaction occurs quickly, but the secondary processes take place more slowly. The quality of the finished concrete is controlled to a considerable degree by moisture factors. Continued hydration of the cement in the concrete takes place ideally between 60 and 80 degrees F., and moisture in the concrete is necessary. No additional curing will take place after the concrete has dried out.

A common practice is to prestress the concrete so that the concrete should be kept moist for a period sufficient to hydrate the cement adequately. This will depend on the thickness of the sections. There are many techniques for providing this moisture. Conventional moisture barriers such as burlap may be applied to walls and columns, and water-tight paper used on floors or slabs.

In all methods of keeping concrete moist, after removal of forms, the moistening should be continuous. Alternate wetting and drying will not be effective, and may promote crazing or cracking of the surface.

Sealing compounds are available for improved curing. These are available in black and white, and colored coatings, and should be applied as soon as possible after the surface has been finished. If there is any delay, the slab should be kept moist until the curing compound is applied. On formed surfaces, the forms are removed, the surface lightly sprayed with water, and the sealing compound then applied. Surfaces which should be protected against traffic should have an inch or more of sand or earth cover. This should not be put on sooner than 24 hours after the sealing compound.

The hydration reaction will not take place below freezing temperatures. To have effective hardening in cold weather, the temperature of the concrete must be kept at 30 degrees or more for at least five days. Some heat is generated in the concrete by the hydration, but it is necessary to provide additional heat from salamanders, oil heaters, etc., and protect the concrete with tarpaulins, straw, or a weather-tight enclosure. If an enclosure is built, the warmed air must circulate around the outer members of the structure.

Cold weather concrete work may require that the water and aggregates be heated before mixing. In relatively mild temperatures, it will be sufficient to heat the water only; this is easiest and most efficient. Water should not be heated to over 175 degrees, whereas, with the cement, as a flash set would otherwise occur. Hotter water may be added to the aggregates, which will cool it, before cement is added. Water is readily heated on the job by portable heaters having steam coils passing through a water tank, or by placing water drums around a coke salamander, for small work.

In extremely cold weather, heating of both the water and aggregates is required. Aggregates may be heated on large projects by steam pipes in storage bins or piles, but it is more usual on small work, while the sand and gravel over a section of culvert steel pipe in which a fire is built.

Calcium chloride may be used in cold weather to accelerate curing, provided the specifications do not prohibit its use. No more than two pounds of chloride per bag of cement should be used. This does not act to reduce the freezing point of the concrete; the optimum curing temperatures should still be maintained as closely as possible, and any concrete permitted to freeze within 24 hours after being placed will be permanently reduced in strength.

Removal of Forms

The advantage of leaving the forms in place for an extended period as an aid to the curing of concrete has been mentioned. However, there are reasons why it is desirable to remove the forms as soon as possible. For instance, patching of formed surfaces should be done as soon as possible, and this requires removal of the forms. If a rubbed finish is specified, the forms should be removed to permit rubbing before the concrete has become too hard. Also, it is often necessary to remove the forms to permit their immediate reuse.

Forms should not be removed under any conditions until the concrete is strong enough to carry its own weight and any construction loads it may be called upon to handle. Also, the concrete should be hardened so that it will not be damaged by the removal of the forms.

Care should be used in removing forms not to damage the concrete. Pinch bars should not be placed against the concrete surface, but should have a wedge or block interposed for protection. Recessed forms should be left in place as long as possible so as to shrink away from the concrete. Only wooden wedges should be used in loosening forms, and jerking loose should be avoided, as this will chip or break the edges.

Prestressed Concrete

In conventional reinforced concrete, the compressive strength of the concrete is combined with the tensile strength of steel. This combination places definite limitations on the thickness and weight of unsupported unsupported columns or slabs.

The basic theory of prestressed concrete is to eliminate or reduce the tensile stresses to which unsupported areas such as roofs, floors, and the walls of tanks and pipe are subjected. This is done by stretching the reinforcing steel so as to induce compressive stresses in the concrete.

A comparison may be made with a row of books. If the two end volumes of a row are merely lifted, the center books will remain in place. However, if the row is squeezed together with the hands at the ends, and then lifted, the whole row picks up as a unit. In the same way, tension applied to reinforcing rods or wire, sets up compressive strains in the concrete which greatly increases its strength.

The strengthening compressive stresses are induced in prestressed concrete in either one of two major ways; by pre-tensioning or by post-tensioning of the steel reinforcement. In the pre-tensioning process, the steel is stretched before the concrete is placed or has set, and is anchored by bond within the concrete. After the concrete has hardened around the tensioned reinforcement, the jacks or stressing forces are released. As the steel seeks to shrink back to its original length, the tensile stresses are converted into compressive stresses in the concrete.

In post-tensioning, the steel is stretched after the concrete is hardened, and is anchored externally by means of plates or other gripping devices. In this process, the steel is tensioned against the concrete so that the greater the tension on the steel, the greater the compression in the concrete.

Because of the stresses involved, high tensile strength wire is necessary in prestressed concrete.

Pneumatically Applied Concrete

Concrete may successfully be applied by pneumatic pressure. Graded aggregate, less than 3/4-inch in size, is mixed with portland cement and (Continued on page 301)
HOW SYMONS FORMS
Help To Build Better Foundations
—Easily and Economically

1. Starting at a corner, panels of the outside form are erected. Spreader ties are placed in position and anchored on the same connecting bolt, locking panels together.

2. Inside panels join projecting ties. Forms are aligned and braced with waler.

3. Section showing inside and outside forms ready to pour.

4. To strip wall remove locking wedges and connecting bolts. Pull panels back easily. Break off tie loops with a ½ twist. Wall is smooth, strong and waterproof.

RENT, BUY or BUILD YOUR OWN FORMS

Symons Forms may be rented for one month or more. Rentals apply on the purchase price.
Hardware and construction information is available for those who prefer to build their own forms.
Symons will prepare a form layout and a cost sheet for any type forming job—no obligation. Send a complete set of plans with your request.

APRIL 1952
placed in a pumping machine from which it is fed into a hose at about 35 to 55 pounds pressure. Water is fed to the nozzle at a pressure about 15 pounds higher than that of the dry mix, and is sprayed on to form a homogeneous concrete. Less water is used in this process — about 3½ gallons per bag of cement — because the impact force expels excess moisture, air, and uncoated cement.

This concrete may be shot against any appropriate sturdy surface, including earth, to a width of several inches without slumping. This method may be used for building swimming pools, for repairing, waterproofing, fireproofing, and for protecting steel. Concrete blocks laid up in a pumping machine have developed over three times the tensile strength of conventionally laid blocks.

The pneumatic application can be used for applying against a hydrostatic head, and the machine may also be used for applying plaster.

STUCCO AND CONCRETE COATINGS

Portland cement stucco is typically composed of one part of cement and three to five parts of damp, loose, well-graded aggregate. Hydrated lime, up to 10 per cent by weight of the Portland cement may be added as a plasticizing agent for better workability. Proportions should be accurately measured and thoroughly mixed. From three to five minutes of mixing time in a drum mixer is about normal.

Frame buildings to be stuccoed should have sheathing more than eight inches wide. This is covered with a 15-pound building paper, lapped three inches at joints and flashings. A steel reinforcing mesh is applied with furring nails that space out the mesh 1/2 to 3/4 inches. Reinforcing joints should lap an inch and be staggered and lapped three inches at flashings. The building is then ready for stucco application.

Another point to consider in the preparation of the structure is the avoidance of concentrated water flows. Those used for overhangs, and downspouts, hangers, fasteners, and other trim should be in place before the stucco is applied. Flashings should be installed around the tops and sides of openings, particularly around chimneys that are to be stuccoed. Although stucco is occasionally run to the ground level, it is better to stop about six inches above ground to prevent moisture seeping and staining.

Stucco will bond readily to masonry and concrete walls. Concrete walls should be cleaned with a weak acid solution and rinsed to insure a clean bonding surface.

Stucco goes on in three coats, each being applied in one direction so that the mortar does not harden at the edges. Stops should be made only at natural divisions in the work. The first or scratch coat is applied about 1/4 of an inch thick, and allowed to set for 48 hours. A fog spray is applied, and the second, or brown coat, about 3/4-inch thick, is applied. Both of these coats are scratched to provide bonding for succeeding coats.

The brown coat is permitted to moist cure for 48 hours, and should be air dried for about seven days before the final coat is applied. The finish coat should be not less than 3/8-inch thick, and is applied after the surface of the brown coat has been moistened.

A number of techniques and a variety of special equipment have been developed for treating finishing coats of stucco to make it resemble stonework. When properly done, strikingly attractive results may be obtained. In some applications after the stucco is scored to resemble mortar joints, the panels resembling stone work are individually colored in non-uniform pattern. Much of the success of this type of work depends on the skill of the workmen and should not be undertaken unless experienced help is available.

PRECAST CONCRETE

Precast concrete is used mostly in the form of masonry units — concrete block, sill, slabs, etc. The development of the low-cost concrete block has been made possible largely by automatic concrete block-making machines, in which cement, water, aggregate and coloring are all mixed, formed, compacted and delivered for curing. Many of these machines are capable of producing as many as 10,000 units a day. At the other extreme, there are block machines operated by hand for farmers who have the time and suitable aggregates available for casting their own block.

Many contractors find that a small concrete block plant is a profitable side-line, in addition to being a dependable source of quality block.

The wide variety of uses of concrete block include both load-bearing and non load-bearing functions. Foundation walls, piers, partitions, party walls, chimneys, back-up walls, sills, lintels and the like are all readily erected with concrete masonry units. The following is a partial list of the masonry unit forms now being made by manufacturers in a variety of sizes:

<table>
<thead>
<tr>
<th>Slab</th>
<th>Sash block</th>
<th>Cap Block</th>
<th>Header block</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coping block</td>
<td>Chimney block</td>
<td>Floor filler block</td>
<td>Bull nose block</td>
</tr>
<tr>
<td>Siding block</td>
<td>Grade block</td>
<td>Ashlar block</td>
<td>Corner block</td>
</tr>
<tr>
<td>Plant block</td>
<td>Sill block</td>
<td>Steel sash block</td>
<td>Beam lintel block</td>
</tr>
<tr>
<td>Brick</td>
<td>Catch basin block</td>
<td>Roof tile</td>
<td>Concrete pipe</td>
</tr>
<tr>
<td>Drain Tile</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Although these units are made in various sizes, their dimensions are usually modularly co-ordinated to simplify building problems. Actual dimensions are short 3/4-inch or 3/8-inch of normal sizes to allow for mortar joints. Thus, the standard 8 by 8 by 16-inch unit actually measures 7 3/4 by 7 3/4 by 15 3/4 inches. Concrete block are an economical masonry unit for houses because they are relatively large, more quickly set than brick, reduce time to cure, and more economical of mortar.

Concrete masonry units may be made to have excellent fire-retarding and acoustical properties. Aggregates may be selected to give light weight or extreme density. In addition to sand and fine gravel aggregates may include expanded slag, pumice, vermiculite, and other materials.

Structural Units

In addition to all of the different types of masonry units, there is a variety of structural units, such as joints, slab sections, and wall sections are precast. Many of these sections are of pre-stressed construction, giving strength with light weight and permitting many new architectural applications and design treatments.

TERRAZZO AND DECORATIVE CONCRETE

Terrazzo, made with marble chips, cement, and water, is a decorative concrete floor material combining beauty, flexibility of design, permanence and ease of maintenance. Terrazzo is usually placed in a layer two to three inches thick on a concrete base. It may be either bonded to the concrete or be an independent slab. The design may range from simple geometric patterns to intricately detailed pictorial panels. Outlines of differently colored areas are obtained by the careful setting of brass, white metal, or plastic strips. Both colored marble chips and color added to the cement are used to provide various tints and hues.

Terrazzo is also used as a service floor where appearance is not a factor, but durability, sanitation, and ease of maintenance are desired. Regular gray portland cement may be used, and aggregates selected on a basis of durability.

Colored concrete for decorative walks, driveways, and similar uses is
most readily produced by the addition of color to the concrete after it has been placed. The coloring is mixed with approximately equal parts of cement and sand and dusted on the surface of the concrete after it has just started to set. The pigment-cement-sand mix is troweled into the surface, and provides a durable finish, while paints would soon wear off.

---

### Recommended Mortar Mixes

<table>
<thead>
<tr>
<th>Type of service</th>
<th>Cement</th>
<th>Hydrated lime or limestone</th>
<th>Mortar and sand, deep brown cement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ordinary service</td>
<td>1 part cement to 3 parts sand</td>
<td>1 to 1/4</td>
<td>1 to 1/2</td>
</tr>
<tr>
<td>Surface to be exposed to weather</td>
<td>1 part cement to 3 parts sand</td>
<td>1 to 1/4</td>
<td>1 to 1/2</td>
</tr>
<tr>
<td>Interior or moist</td>
<td>1 part cement to 3 parts sand</td>
<td>0 to 1/4</td>
<td>2 to 1</td>
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</tbody>
</table>

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### Quantities of Concrete Block and Mortar

<table>
<thead>
<tr>
<th>Wall thickness</th>
<th>For 100 sq. ft. of wall</th>
<th>For 100 concrete block</th>
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</thead>
<tbody>
<tr>
<td>in.</td>
<td>lbs of block</td>
<td>Mortar</td>
</tr>
<tr>
<td>8</td>
<td>112.5</td>
<td>26</td>
</tr>
<tr>
<td>12</td>
<td>112.5</td>
<td>26</td>
</tr>
</tbody>
</table>

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Color in concrete can be obtained by any one of three methods: colored cement topping, dusting with pigments and cement, and applying acid stains.

### Coloring Pigments

Pigment suitable for coloring concrete must fulfill the following requirements: (1) it must be durable under exposure to sunlight and weather, (2) must produce intense color, (3) must not react chemically in such a way as to harm the cement or color.

The best coloring agents are mineral oxides pigments. Others, such as organic dyes, have a tendency to fade and reduce the strength of the concrete. The natural oxides come directly from the mine and are satisfactory where dull colors can be used. Manufactured oxides are prepared for concrete work and produce

---

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---

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to replace! ROCFORM strong aluminum walers are permanently attached to each panel—always in place for immediate use. Why pay a continuing penalty for wood walers or liners and the burden of constant handling over and over again on each job?

---

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Street:
City: State:

Amounts of Color for Colored Topping

Color is produced by weight proportion between color and cement and not by the cubic feet of the concrete used. Manufacturers suggest that the coloring material be used by weight for each bag of cement. A rule of the thumb is that pigment weights up to 10 per cent of the weight of cement may be used. Therefore 9 pounds of color can be used for each 94-pound bag of cement. However, the manufacturer’s directions should be followed.

Aggregates used in colored cement should be as near the color of the concrete as possible. If these are not available the use of light colored semi-transparent aggregates should be used.

Mixing Colored Concrete Topping

For uniform coloring the pigment and the cement should be mixed together before being delivered to the job. Many times factory prepared colored cement is economical to use. However, small batches can be mixed satisfactorily by sifting the two materials through a fine screen. For larger quantities the materials can be mixed in a dry concrete mixer. Recommended proportion for mixing the colored concrete on the job is 1:1.14. For example—

<table>
<thead>
<tr>
<th>Aggregate</th>
<th>Color</th>
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</thead>
<tbody>
<tr>
<td>1 sack of colored cement</td>
<td>1 cubic foot of sand</td>
</tr>
<tr>
<td>1 1/4 cubic feet of coarse aggregate</td>
<td></td>
</tr>
</tbody>
</table>

Colored cement can be placed by any one of three methods: The two-course integral, regular two-course, or the one-course method.

The two-course integral method is one in which the colored topping is placed before the base course hardens. It is used where the colored concrete can be placed and finished immediately.

In the regular two-course method, the colored topping is placed after the base course hardens. The surface of the base course is left rough to secure a good bond. This method is generally used for floors. Before placing the colored topping the base course should be cleaned and dampened. The under layer should be grouted a short distance ahead of the colored topping. Colored toppings need to be at least one-inch thick.

In the one-course method a full thickness of colored concrete is poured. This method is seldom economical except in thin slabs or in light tints of color.

Dusted-on-Color

For floors subjected to light traffic, dusted-on-color can be used. A one-inch wearing surface is placed, and after screeding and leveling, the dusted mixture is applied immediately. The mixture is made with one part of cement, 1 to 1 1/4 parts of sand, and the required amount of pigment. The sand should be well graded so that 80 per cent will pass through a No. 8 sieve, while not more than 2 per cent passes through a No. 30 sieve. The mixture should be applied uniformly at the rate of 125 pounds per 100 square feet. After spreading the color mixture it

bright colors. These are more expensive than natural oxides but many times their use is cheaper as less pigment is needed to produce certain shades.

Rules for coloring with the oxides are:

- For blacks use cobalt oxide.
- For browns use brown oxide of iron.
- For buffs use synthetic yellow oxide of iron.
- For greens use chromium oxide.
- For reds use red oxide of iron.
- For grays or slate effects use black iron oxide or germantown lamp black, preferably black oxide. Common lamp black should not be used.
- For tempering of shades these pigments can be mixed.
should be floated and worked into the slab. Floating should be discontinued as soon as the surface becomes wet, and resumed when the surface moisture has disappeared. After testing with a straight edge it should be troweled to a smooth finish.

Curing Colored Concrete—
Scoring and Division Strips

As soon as the colored concrete has hardened it can be covered with a one-inch layer of wet sand or other covering and kept wet for five days.

Concrete floors may be marked off into patterns by the use of an ordinary scoring tool on the fresh concrete. Scoring can also be accomplished by a power-driven carborundum disk cutting the hardened concrete. Difficulty in keeping the grooves clean is the main objection to grooving. Metal strips like those used in terrazzo floors can be used as division strips. They must be set at the finished concrete level if hand troweling is to be the only finishing.

Acid Stain Colors

Various tones of brown, buff, and green can be produced by inorganic acid stains. The chemical compound is applied to the concrete after it hardens.
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STUCCO APPLICATION DATA

NOTE—The areas covered by one barrel of cement or one cubic yard of sand, as given below, are calculated for an average sand and without allowance for waste. Openings are not deducted. When figuring for stucco, the loss of mortar, forming the keys for the first coat, should be taken into account.

### Area Covered by 1 Barrel of Cement in Various Mixes

<table>
<thead>
<tr>
<th>Mixture Parts by Volume</th>
<th>Thickness of Mortar Coat</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>1/4 Inch</td>
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<td>1½</td>
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<td>2</td>
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<td>1</td>
<td>2½</td>
</tr>
<tr>
<td>1</td>
<td>3</td>
</tr>
</tbody>
</table>

### Quantities of Stucco Material Required Per 100 Sq. Ft. of Wall

<table>
<thead>
<tr>
<th>Mixture</th>
<th>1:2½ Mix</th>
<th>1:3 Mix</th>
<th>1:3½ Mix</th>
</tr>
</thead>
<tbody>
<tr>
<td>Parts by Volume</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mixture</td>
<td>Cement</td>
<td>Sand</td>
<td>Cement</td>
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<td>Cu. Ft.</td>
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<td>1/4&quot;</td>
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<td>.79</td>
<td>1.96</td>
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<td>3/4&quot;</td>
<td>3.13</td>
<td>1.19</td>
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<tr>
<td>1&quot;</td>
<td>4.17</td>
<td>1.58</td>
<td>3.94</td>
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<tr>
<td>11/2&quot;</td>
<td>5.21</td>
<td>1.98</td>
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<tr>
<td>1 1/2&quot;</td>
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<td>5.90</td>
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<tr>
<td>2</td>
<td>8.33</td>
<td>3.16</td>
<td>7.86</td>
</tr>
</tbody>
</table>

### Area Covered by 1 Cubic Yard of Sand in Various Mixes

<table>
<thead>
<tr>
<th>Mixture Parts by Volume</th>
<th>Thickness of Mortar Coat</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1/4 Inch</td>
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<td>1½</td>
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<td>2½</td>
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<td>3</td>
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</table>

WATERPROOF CONCRETE

Water-tight concrete may be readily obtained through the use of waterproofed cement now widely available. Also, waterproofing powders may be added in the mix to regular cements. Concrete made with these types of cement should be carefully cured, for once dry, the concrete cannot be wetted for additional curing. Concrete made with regular port-

Keystone Steel and Wire Data
pounds. When manufacturers' directions are carefully followed for application, usually by brush or spray, the leakage of water and penetration of moisture can be stopped if construction is good.

**MORTAR FOR MASONRY UNITS**

Mortar for bedding masonry units, brick, stone and the like must have several essential characteristics. The material must be plastic and "hang" well to the brick, but must not be too fat, so as to be sticky. Low shrinkage and high strength are necessary; the mortar should also have good yield; that is, it should carry an adequate volume of sand in relation to the cement and/or lime.

The traditional method of making mortar by air-slaking quicklime with water to form a hydrated lime for the cementing agent, has been almost completely supplanted by the use of prepared mortar cements and lime-cement mixtures. Mortar made with commercial cements requires only the addition of sand and water to be mixed and used immediately. Mortar may either be mixed wholly with mortar cement or may have regular portland cement added for additional strength, greater water-resistance when cured, and slightly better handling and setting characteristics. Exact compositions should be based on the type of masonry units used, manufacturers' recommendations and the experience of the contractor and masons.

Mortar sand should be finer than sand used as a fine aggregate in concrete. Particles should be uniform in size, sharp and clean. Mortar-mixing is usually with a power mixer which gives uniform mortar, efficiently and economically. The mortar box and hoe are, however, still standard equipment for small masonry jobs such as chimneys, fireplaces, and small brick and stone veneer jobs.

**Mortar in Use**

Proper application of the mortar to the masonry units is as essential as good quality mortar to a strong, durable job. The units should be soaked with water to reduce absorption from the mortar. Full mortar beds and complete filling of spaces at ends of units are essential. In hollow wall construction, the inner faces should be parged to prevent moisture entrance.

**Nominal Height of Concrete Masonry Walls by Courses**

For concrete masonry units 7/8" and 3/4" in height laid with 1/4" mortar joints. Height is measured from center to center of mortar joints.

<table>
<thead>
<tr>
<th>No. of courses</th>
<th>Units 3/4&quot; high and 3/8&quot; thick bed joint</th>
<th>Units 3/4&quot; high and 3/8&quot; thick bed joint</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
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<td>38 73/8&quot;</td>
<td>38 73/8&quot;</td>
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<tr>
<td>39</td>
<td>39 75/8&quot;</td>
<td>39 75/8&quot;</td>
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<td>40</td>
<td>40 77/8&quot;</td>
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<td>41 79/8&quot;</td>
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<td>42</td>
<td>42 81/8&quot;</td>
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<td>43 83/8&quot;</td>
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<td>45 87/8&quot;</td>
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<td>46 89/8&quot;</td>
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<td>48</td>
<td>48 93/8&quot;</td>
<td>48 93/8&quot;</td>
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<td>49</td>
<td>49 95/8&quot;</td>
<td>49 95/8&quot;</td>
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<tr>
<td>50</td>
<td>50 97/8&quot;</td>
<td>50 97/8&quot;</td>
</tr>
</tbody>
</table>
Suggested Concrete Mixes

<table>
<thead>
<tr>
<th>Kind of Work</th>
<th>U. S. gallons of water to add to each 1-sack batch</th>
<th>Trial mixture for first batch</th>
<th>Maximum aggregate size, inches</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Damp sand</td>
<td>Wet sand</td>
<td>Very wet sand</td>
</tr>
<tr>
<td>Foundation walls, columns and chimneys, retaining</td>
<td>(Average sand) 6½</td>
<td>5½</td>
<td>4½</td>
</tr>
<tr>
<td>Watertight basement walls, driveways, walls,</td>
<td>(Average sand) 5½</td>
<td>5</td>
<td>4½</td>
</tr>
<tr>
<td>floors on ground; basement floors, porch floors</td>
<td>(Average sand) 5½</td>
<td>5</td>
<td>4½</td>
</tr>
<tr>
<td>paved terraces, concrete steps.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Suspended reinforced concrete floors of all types,</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>reinforced concrete posts and columns, sills, lintels.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

How to Select the Proper Mix

Recommended proportions of water to cement and suggested trial mixes

<table>
<thead>
<tr>
<th>Kinds of work</th>
<th>Gallons of water to add to each sack batch if sand is</th>
<th>Suggested mixture for trial batch</th>
<th>Materials per cu. yd. of concrete</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Very wet (average sand) Damp Wet Damp</td>
<td>Cement sacks</td>
<td>Aggregates</td>
</tr>
<tr>
<td>5-gallon paste for concrete subjected to severe</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>wear, weather, or weak acid and alkali solutions</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>One-course industrial, creamery and dairy plant</td>
<td>3½</td>
<td>4</td>
<td>4½</td>
</tr>
<tr>
<td>floors, etc.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Watertight floors, such as industrial plant,</td>
<td>4½</td>
<td>5</td>
<td>5½</td>
</tr>
<tr>
<td>basement, dairy barn; watertight foundations;</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>driveways, walks, tennis courts, swimming and</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>wading pools, septic tanks, storage tanks,</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>structural beams, columns, slabs, residence floors,</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>etc.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6-gallon paste for concrete to be watertight or</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>subjected to moderate wear and weather</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Foundation walls, footings, mass concrete, etc.</td>
<td>1½</td>
<td>5½</td>
<td>6½</td>
</tr>
</tbody>
</table>

Proportions By Volume

<table>
<thead>
<tr>
<th>Type of wall</th>
<th>Cement</th>
<th>Hydrated lime or lime putty</th>
<th>Mortar sand in damp, loose condition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ordinary</td>
<td>1 masonry cement* or 1 portland cement</td>
<td>2 to 3</td>
<td>1 to 1½</td>
</tr>
<tr>
<td>Subject to extremely heavy loads, violent winds,</td>
<td>1 masonry cement* plus 1 portland cement</td>
<td>4 to 6</td>
<td></td>
</tr>
<tr>
<td>quakes or severe frost action</td>
<td>Isolated piers</td>
<td>1 portland cement</td>
<td>0 to 1½</td>
</tr>
</tbody>
</table>

Approximate Amounts of Material

Required Per Cubic Yard of Concrete

<table>
<thead>
<tr>
<th>Type of concrete</th>
<th>Sacks of cement</th>
<th>Sand cu.yd</th>
<th>Gravel cu.yd</th>
<th>Maximum size of gravel</th>
</tr>
</thead>
<tbody>
<tr>
<td>All concrete 4 in. to 8 in. thick 1:2½:3 mix</td>
<td>6½</td>
<td>7½</td>
<td>9½</td>
<td>1½ cu.yd.</td>
</tr>
<tr>
<td>All concrete 2 in. to 4 in. thick 1:2½:2½ mix</td>
<td>6½</td>
<td>7½</td>
<td>9½</td>
<td>1½ cu.yd.</td>
</tr>
</tbody>
</table>

requires approximately 6½ sacks of cement, 3½ cu.yd. of sand and 3½ cu.yd. of gravel. Then for the 3 cu.yd. of concrete needed for the septic tank one would need:

- 3 x 6½ sacks cement = 18½ (19) sacks of cement
- 3 x 3½ cu.yd. sand = 2 cu.yd. sand
- 3 x 3½ cu.yd. gravel = 2½ cu.yd. gravel
PROPER use and application of plaster bases is important in the construction of strong and durable finished walls and ceilings. A secure bond between the plaster base and the plaster is essential to develop strength and resistance to abuse, bumps, and cracking.

Gypsum plaster adheres to a plaster base because a bond is developed which virtually makes the two materials a solid unit. A "mechanical" bond is formed when plaster is pressed through the mesh or holes of the lath, forming keys on the other side. The keys actually rivet the lath and plaster together. This mechanical bond results when plaster is applied over metal lath or perforated gypsum or fiber insulating lath.

A "suction" bond is formed when gypsum plaster is applied over gypsum lath, sheet fiber insulating lath and masonry bases. In these cases the tiny needle-like crystals of the plaster penetrate into the surface pores of the base material by suction. When the plaster sets, the base material becomes "welded" to the plaster. When perforated gypsum lath is used, both suction and mechanical bonds are developed.

PLASTER BASES
Metal Lath

According to the Metal Lath Manufacturers Association, there are ten basic features of metal lath which make it effective when used with plaster:

1. Impact resistance. This type of construction is said to offer maximum resistance to accidental blows and impacts and destructive forces of all kinds;

2. Adaptability. It is easily cut for fitting, easily bent without breaking to follow curves and form strong angles, and facilitates the plaster enclosure of light fixtures and heating units as well as plumbing and other installations.

3. Crack Resistance. The tensile strength of the metal lath resists any tendency the plaster may have to crack when the structure moves or vibrates, as the metal lath forms a continuous two-way reinforcement.

4. Rigidity. With as many as 1,000 mechanical keys holding the plaster positively in place per square foot, the entire construction develops a high ability to withstand the ravages of fire, hose stream, earthquake, or explosion.

5. Sanitation. Where steel reinforcing combines with plaster to form a hard, crack-free surface, the walls naturally receive a high rating from a sanitary standpoint as they provide little or no hiding place for germs.

6. Fire Resistance. Exhaustive tests have demonstrated the high fire-resisting qualities of this type of construction, especially in halls and stairwells.

7. Sound Control. Acoustical plaster over metal lath absorbs sound waves within a room, and both normal 2-inch solid and 4-inch hollow wall partition systems of ordinary plaster with metal lath have sound insulation values, the latter providing a reduction in sound of up to 55 decibels.

8. Light Weight. Light-weight aggregates used with metal lath and gypsum plaster permit great savings without in any way reducing fire resistance or strength of wall.

9. Foolproof. Metal lath is attached to supports in a variety of standardized ways so that it is usually easier and faster to apply the
METAL LATH SECURED TO STEEL JOISTS should be secured to the lower chord of steel joists with two strands of 16 gauge tie wire or four strands of 18 gauge wire at intervals of six inches, or with special clips. Free ends of tie wire should have at least three twists for security.

METAL LATH ATTACHED TO CONCRETE JOISTS. Hangers for attaching metal lath directly to the underside of concrete ribs approximately 25 inches on center should be placed in forms before concrete is poured. They should be hook, loop or lathpin type, not less than 14 gauge galvanized annealed wire when twisted as in tie wire and not less than 10 gauge galvanized wire when struck over to support the lath. Space not more than five inches apart.

full thickness of plaster and do a good job, than it is to follow any other practices.

10) Economy. Numerous economies in construction costs come from ease of handling, ease of installation, versatility, durability, and other qualities.

Types of Metal Lath and Accessories

Metal lath is of three basic types: diamond mesh (also called flat-expanded), rib, and sheet. Diamond mesh is metal lath slit and expanded from metal sheets into such a form that there is no rib in the lath. Rib metal lath has either a separately attached stiffening member or an expanded portion which leaves the plane of the lath at an angle and returns at the same angle, imparting a certain rigidity. Sheet lath is simply slit or punched from metal sheets, usually galvanized.

Accessories used include a wide variety of small nose and bull-nose corner beads, base screen, concealed picture molding, and metal casings of various sorts. Special channels, hangers, and metal studs are properly considered as framing members rather than lathing accessories.

Fiber and Insulation Lath

A number of manufacturers who produce insulating boards, sheathing, and wallboards of a fiber base also manufacture these materials as plaster bases. One fiber insulating plaster base is manufactured in a size ½ by 48 inches from wood fibers felted together. It is easily applied to studs or joists not over 16 inches apart. It bonds satisfactorily with gypsum plaster but not with plaster containing vermiculite aggregate. A full ½-inch of plaster is required, and it should not be used where the surface will be exposed to excessive moisture or humidity.

This lath should be applied with the long dimension at right angles to the framing members, butted with staggered vertical joints. Regular 1½-inch blued lath nails should be used approximately four inches apart. Center end joints on framing members. Cut accurately to fit lath around electrical fixtures, etc., and reinforce all interior angles with cornerite. Corner bead should be applied to all exterior angles by nailing through to framing.

Another type of insulating lath is one which has aluminum foil or other vapor barrier applied to one side by the manufacturer. Such lath is usually gypsum, although fiber lath in some instances has the same type of foil attached.

Wire and Paper Combinations

One familiar paper-wire combination is simply standard metal lath with paper backing applied by the manufacturer. Such paper backing frequently has a foil layer which serves as vapor barrier. Other types include coarsely woven wire with paper backing, and wire woven into and around paper strips.

Manufacturers claim for these products the advantages of automatic back-plastering without plastic keys (as all of the reinforcement is embedded in the first coat of plaster), no lath or stud marks, all angles and laps reinforced, instant bonding action due to the fibrous character of the paper used, and ease of handling and cutting.

At least one group of plasterers has found that such lath may be plastered by spraying, speeding construction and cutting costs while providing good quality work. First and second coats are sprayed on while finish coat is applied by hand in regular manner. One man operates the spray

FURRED CEILING ON RIB CONCRETE CONSTRUCTION. For concrete ribs centered approximately 25 inches, channel runners should be supported against bottom of ribs by hangers of two 14 gauge galvanized wires or similar strength with loops embedded 2 inches in the concrete. Hangers should be placed before concrete is poured and spaced 36 inches on center to engage 3/4-inch channels running parallel to the ribs. Hangers should be securely saddle-tied or wrapped around the cross channels. Cross furring members should be saddle-tied to channel runners at each intersection.

FURRED CEILING ON STEEL JOISTS. Furring members should be ¼-inch cold rolled channels and should be erected at right angles to the joists. They should be securely attached to the bottom chords with 2 strands of 16 gauge or 4 strands of 18 gauge galvanized wire or other approved attachment of equal strength. Metal lath should be attached to furring with wire ties not more than 6 inches apart.
METAL LATH TIED AND NAILED TO WOOD JOISTS (Contact Ceiling). For structures of greater than ordinary vibration, or where normal holding power of nails cannot obtain, metal lath should be attached to the wood with 1 1/2-inch No. 11 gauge roofing nails. For tying: 16d common nails are driven in a horizontal position clear through joists 2 inches above bottom edge of joists; metal lath is then secured to these nails by at least 2 strands of 18 gauge tie wire gun while three work at rodding and darbying. Plasterers like it because of the saving in physical effort.

Gypsum Lath

Gypsum lath made in sheet form in thickness of 3/8 and 1/2 inches consists of a core of gypsum pressed and rolled between two layers of special absorbent paper. It not only provides a perfect bond with gypsum plaster but adds bracing to the framing, lowers transmitted noise from room to room and is economical to apply. It is not harmful by decay, dry rot or normal moisture, will not attract vermin, and is of fireresistant core as well as being highly resistant to warping or buckling and cracking.

Gypsum lath, 3/8-inches thick, is designed for supports not over 16 inches on centers; where wider framing supports are used, 1/2-inch lath is required, but joists or studs should still be not over 24 inches on center. With 3/8-inch gypsum lath on framing members over 16 inches on center, plastering should be done by the three-coat method. This type of lath should be used with gypsum plaster only, as a bond with lime or portland cement plaster is inadequate. It should not be used in areas exposed to excessive moisture for long periods, and where one-hour fire resistance ratings are required, perforated gypsum lath should be used. The perforated gypsum lath is identical with the standard except that at 4-inch intervals holes approximately 3/4-inches in diameter have been punched through, allowing plaster to key mechanically to the back of the lath, thus providing both mechanical and suction bond.

Perforated gypsum lath should not be used on ceilings with resilient clips or other side suspension clip systems; its other limitations are the same as those for regular gypsum sheet lath.

Application of Gypsum Lath

For 3/8-inch gypsum lath, use 1 1/2 inch 13 gauge blued smooth diamond point nails; for 1/2-inch lath use 1 1/4-inch length. For nailable steel framing use nails of proper gauge with not less than 1/4-inch heads and long enough to develop the proper nail holding of the framing. Steel framing should not be over 24 inches on center.

Space nails approximately 3/4-inches from the edges and ends, approximately five inches apart, using 4 nails per lath support. For 1/2-inch

SUSPENDED CEILINGS OF METAL LATH BELOW CONCRETE FLAT SLAB CONSTRUCTION. Hangers should be secured to steel reinforcement in concrete with cinder aggregate and may be secured to steel reinforcement or looped or embedded in the concrete with other aggregates. Special inserts to which hangers may later be attached may be inserted through or attached to the top of the forms in lieu of anchoring hangers directly in the concrete.
Smalmesh Metal Lath
A general utility lath. Can be readily bent or formed for furred or ornamental members. Due to the small, rigid mesh a minimum of plaster is required to produce a perfect key.

**Sheet Size:** 27" x 96", packed 10 sheets (20 sq. yds.) per bundle. All sheets squared.

**Materials and Weights:** (lb. per sq. yd.):
- Copper Alloy Steel, Painted: 2.50 lb., 3.40 lb.

Specialmesh Metal Lath
A rib lath for walls and ceilings. Saves plaster; provides excellent bond. Ribs 1/4" wide; 1/4" on centers. Cross strands at 1/4" intervals, reinforced by stiffening members (two between each pair of ribs). Sheets squared on ends. Well suited to "two coat work" or "back plastering."

**Sheet Size:** 24" x 96", packed 9 sheets (16 sq. yds.) per bundle.

**Materials and Weights:** (lb. per sq. yd.):
- Copper Alloy Steel, Painted: 2.75 lb., 3.40 lb.

3/4" Stay-Rib Metal Lath No. 2
Ideal self-furring lath for wide ceiling spans and for floor reinforcing over steel joists. 1/2" heavy ribs spaced 4.8" on centers. Five stiffening members between ribs. Connecting strands at 1/4" intervals. Rigidity of ribs saves labor and material when supports are widely spaced.

**Sheet Size:** 24" x 96", packed 9 sheets (16 sq. yds.) per bundle.

**Materials and Weights:** (lb. per sq. yd.):
- Copper Alloy Steel, Painted: 3.40 lb., 4.00 lb.

3/4" Stay-Rib Metal Lath No. 3
Reinforcement for concrete floors and roofs. Serves as a form for wet concrete. Adaptable to pitched roofs, saw-tooth and monitor-type roofs. Also for reinforcing concrete base for tile, terrazzo, or composition flooring. Five 3/4" ribs spaced 6" on centers. Seven stiffening members between ribs.

**Sheet Size:** 24" wide, 8, 10 and 12 ft. long, 6 sheets in a bundle.

**Materials and Weights:** (lb. per ft.):
- Copper Alloy Steel, Painted: 60 lb., 75 lb.

**Cross-sectional Areas:** (sq. in. per ft.):
- 640 sq. in. for 8 ft., 480 sq. in. for 10 ft., 350 sq. in. for 12 ft.

Milcor Cold Rolled Channels
Accurately formed with true right angles, uniform and straight throughout their entire length. Regularly used with metal lath for suspended ceilings, furring and solid and hollow partitions.

**Sizes:** 1/4" and 1/2" Lengths 16 and 20 ft.

**Packing:** (per bundle):
- 1/4": 20 pieces; 1/2": 10 pieces

**Weights:** (lb. per 1,000 lin. ft.):
- 1/4": 475 lb., 300 lb.
- 1/2": 300 lb., 250 lb., 200 lb., 175 lb., 150 lb., 125 lb.

**Material:** 16 gauge Steel, Painted.

Milcor Solid Partitions and Furring System
Simplifies erection of partitions. Runners have openings for 3/4" Channel Studs. "L" Type Runner for partitions constructed along beams. Metal Base used by employing clips in place of floor runner. 

**Materials and Weights:** (lb. per 1,000 lin. ft.):
- 3/4" Type Channel Stud: 920 lb.
- "L" Type Runner: 274 lb.
- 2" Type Floor Runner: 126 lb.

**Packing:** (per carton):
- Floor Runner: 100 pcs.
- Beam Runner: 50 pcs.

Milcor One Piece Steel Stud and Track
**Large Uniform Openings:** Spaced 6" from centers. Predetermined location for conduits or pipe lines. **Reinforced X-Shaped Members:** Short-span, X-shaped framing reinforced by an embossed corrugation.

**Materials:** 16 gauge Metal, Galvanized

**Weights:** (lb. per 1,000 lin. ft.):
- "L" Type Runner: 129 lb.
- "L" Type Furring: 92 lb.
- "L" Type Beam: 136 lb.

**Packing:** (per carton):
- "L" Type Runner: 40 pcs.
- "L" Type Furring: 36 pcs.
- "L" Type Beam: 26 pcs.

Milcor Arch Bead
Used straight or curved. Snip one or both flanges with tin snips. Bead can then be formed easily into a smooth arch, without kinks or breaks in the nose, by applying slight pressure with the hands. Minimum of metal cutting required.

**Materials:** 26 gauge Sheet Steel, Galvanized

**Weights:** (lb. per 1,000 lin. ft.):
- 7 ft: 75 lb.
- 9 ft: 100 lb.
- 10 ft: 125 lb.

**Packing:** (per carton):
- 7 ft: 80 pcs.
- 9 ft: 60 pcs.
- 10 ft: 50 pcs.

Super-Ex Corner Bead
Combines advantages of Expansion and Solid Wing corner beads. Strong, straight nose reinforced by two solid flange sections, strengthened by corrugations. Integral expansion flange makes excellent plaster bond, simplifies erection.

**Materials:** 26 gauge Sheet Steel, Galvanized

**Weights:** (lb. per 1,000 lin. ft.):
- 7 ft: 70 lb.
- 9 ft: 90 lb.
- 10 ft: 125 lb.

**Packing:** (per carton):
- 7 ft: 80 pcs.
- 9 ft: 60 pcs.
- 10 ft: 50 pcs.

**Inland Steel Products Company**
Manufacturers of over 2,500 products for farm, home, and industry.
No. 1 Expansion Corner Bead
Wide expanded metal wing integral with nose of the bead—plaster keys right up to nose; effective plaster reinforcement exactly where needed.

**MATERIAL:** 26 gauge Sheet Steel, Galv.
**LENGTHS:** 7, 8, 9, 10 and 12 ft.
**WEIGHT (lb. per 1,000 ft.):** No. 10-210 lb.
**PACKING (per carton):** No. 7-80 pcs.

Nos. 10 Expansion & 50 Solid Wing Bull Nose Corner Beads
For broad, rounded corners, with extra resistance to damage from moving carts, wheelchairs, etc. Face of bead 1" wide, radius 7/8".

**MATERIAL:** 26 gauge Sheet Steel, Galv.
**LENGTHS:** 7, 8, 9, 10 and 12 ft.
**WEIGHT (lb. per 1,000 ft.):** No. 10-230 lb.
**PACKING (per carton):** No. 7-80 pcs.

No. 8 and No. 9 Bull Nose Expansion Corner Beads
For extra broad, heavy duty rounded corners. Heavy gauge steel face: No. 8-2" wide, curved to 1 1/2" radius; No. 9-2 1/4" wide, curved to 2" radius. Expansion wing spot-welded to nose.

**MATERIAL:** Expansion Wing—26 gauge Sheet Steel, Galv.
**LENGTHS:** 7, 8, 9, 10 and 12 ft.
**WEIGHT (lb. per 1,000 ft.):** No. 8-340 lb., No. 9-385 lb.
**PACKING (per carton):** 50 pcs.

No. 4 Expansion Casing Bead
(Also available with short, solid flange—24 ga.)
For doors, windows and other openings.

**MATERIAL:** 24 gauge Tight Coat Galv. Steel
**LENGTHS:** 7 ft. and 10 ft.
**WEIGHT (lb. per 1,000 ft.):** 250 lb.
**PACKING (per carton):** 100 pcs.

No. 60 Expansion Casing Bead
(Also available with short, solid flange—22 ga.)
Similar to the No. 4 Casing bead except that the face is flat and has a beveled edge. Slight ridge in the nailing flange of Milcor Casing Beads creates a pressure that holds the nose of the casing bead tightly against the jamb.

**MATERIAL:** 24 gauge Tight Coat Galv. Steel
**LENGTHS:** 7 ft. and 10 ft.
**WEIGHT (lb. per 1,000 ft.):** 250 lb.
**PACKING (per carton):** 100 pcs.

No. 66 Expansion Casing Bead
(Also available with short, solid flange—22 ga.)
Square design with 3/16" return. Expansion Wing feature affords excellent plaster bond and reinforcement; minimizes plaster cracking. Ridge in nailing flange insures tight fit.

**MATERIAL:** 24 gauge Tight Coat Galv. Steel.
**LENGTHS:** 7 ft. and 10 ft.
**WEIGHT (lb. per 1,000 ft.):** 260 lb.
**PACKING (per carton):** 75 lbs., 50 pcs.

No. 77 Flush Base Screed
A strong, straight dividing strip for use between plaster and flush concrete or terrazzo base. Key holes for plaster and concrete in top and bottom flanges. Made in 1/2" grounds only.

**MATERIAL:** 26 gauge Tight Coat Galvanized Steel
**LENGTHS:** 10 ft.
**WEIGHT (lb. per 1,000 ft.):** No. 10-150 lb.
**PACKING (per carton):** 50 pcs.

Milcor Clean Out Doors
Convenient for removing accumulations of chimney debris. New door catch provides positive lock; prevents door from being blown open. New hinge design permits lasting freedom of operation. Wide flanges on frame simplify installation. Stamped from high grade, 16 ga. copper alloy. Furnished painted. Size 8" x 8". Packed six doors per carton—shipping weight: 19 lbs.

Milcor Metal Access Doors
For easy access to utility systems without damage to walls. New spring hinge allows opening to 175°. Number of hinges varies with size of door. Doors removable.

**STYLES:** For plastered walls: Style "K" with expansion wing, Style "L" with solid flange. Style "M" for non-plastered walls.

**SIZE:** 6" x 8" to 24" x 36".

**MATERIALS**

**LOCIES:** Flush cut type; number varies with size of door. Cylinder lock with key furnished as extra charge.

**PACKING:** One per carton.

Milcor Louver Ventilators
Patent Nos. 2,309,717 and 2,340,570
(Continued from page 499)

lath on supports over 16 inches on center use 5 nails per support, 4 inches apart. For one-hour fire rating when using sand as an aggregate, use 5 nails per support plus strip lath on joints.

Gypsum lath should always be applied face out with the long dimension at right angles to framing members. On walls, end joints should be made to fall on different supports in alternate courses. On ceilings, end joints are staggered as for side walls. All joints should be butted together.

All inside corners should be reinforced with cornerite. Staples or nail cornerite to retain position until secured by the plaster. Apply corner bead to all exterior corners by nailing through to the framing.

Masonry Plaster Bases

Gypsum partition tile, a precast gypsum tile for building non-load-bearing fireproof partitions, has a strong natural bond with base coat plaster. Three inch hollow gypsum tile plastered on two sides has a 3-hour fire rating, and the 4-inch tile a 4-hour rating. It should not be used for load-bearing partitions, nor with portland cement or lime plasters. Do not use as a base or starter course where there will be excessive moisture.

Clay tile, usually 12 by 12 inches and from two to six inches thick, with scored faces, serves as a good plaster base, as does concrete block with a rough porous face. Concrete block must be cured to minimize volume changes during and after plastering. Portland cement lime sand mortar is generally used for laying up these load-bearing partitions. Gypsum plaster may be applied directly to these constructions providing the surface is porous to develop proper suction or scored to develop adequate mechanical bond.

BASE COAT PLASTERS

Gypsum Cement Base Coat Plasters

Gypsum base coat plasters are relatively uniform; setting time is stabilized, and hazards due to job conditions and variables in water and aggregates is minimized. Controlled set assures maximum hardness and tensile strength. "Neat" plasters constitute the bulk of tonnage of all types of gypsum plasters used. Gypsum is incombustible, will not transmit high temperatures until completely calcined, actually fights fire by retarding flame.

Aggregates must be added strictly according to specifications. Use of too much aggregate reduces the strength of the plaster slab. "Neat" gypsum plasters, sanded, or wood fiber plasters should never be applied to concrete.

Bituminous compounds do not provide a good base for gypsum plaster base coats. Do not apply such plasters to masonry walls that have been treated with these compounds. Because of possible moisture seepage or condensation, do not plaster directly to the inside of exterior masonry walls. Such walls should be furred. If used in conjunction with radiant heating systems, the temperature at the surface of the plaster should not exceed 115° F., nor should the water in the pipes exceed 125° F.

Sanded Plasters

This material is the same as neat gypsum plaster except that a properly graded sand has been added at the mill in the proper amount for best plastering results. This is particularly suited to areas where good plastering sand is not readily available; it avoids the possibility of oversanding or improper gradation of the aggregate, thus assuring proper strength for the plaster. It also eliminates the problem of frozen sand in winter.

Wood Fiber Plaster

This type of plaster contains a finely shredded wood fiber and is made primarily for use with addition of water on the job. In some cases, a small amount of sand, never more than one part by weight, is added on the job. This addition of sand is said by manufacturers to minimize shrinkage cracks. This type of plaster is recommended for use where excessive strength, toughness, or a higher fire rating is required. It has three times the compressive and tensile strength of plaster sanded 1:3, approximately 50 per cent greater surface hardness, and 50 to 100 per cent greater fire rating than plasters containing sand. It is also desirable for patch and repair work.

Concrete Bonding Gypsum Plaster

This is a specially formulated gypsum base coat requiring only the addition of water on the job. It is the only recommended type of gypsum plaster for direct application to properly prepared and roughened concrete surfaces. Unlike ordinary gypsum plaster, this type has the same thermal expansion as concrete, which

a PERFECT Plaster Bond

for glazed tile—concrete—drywall brick—oil base painted interior surfaces.

Nu-Wall receives any conventional plaster finishes.

Above is a section of the glazed tile wall showing easily applied NU-WALL used as the permanent bonding plaster in the 17-story Fort Worth National Bank Building. NU-WALL was roughly troweled directly on the fire-proof glazed tile. A brown coat of one inch, or more, was applied to the NU-WALL and rodded. Using a perlite aggregate, NU-WALL proved perfect, together with great savings in time, money, labor, and eliminated the need for furred mesh or metal lath.

A. E. Ritchey, regional NU-WALL representative, reports——NU-WALL, after many tests, was given the O.K. by all concerned, with a notable savings as well.


Write Today for Complete Information

NU-WALL MFG. CO.
923 North 19th Street, Milwaukee 3, Wisc. (Dept. A.B.)
APPROXIMATE YARD COVERAGES PER TON ON VARIOUS PLASTER BASES

<table>
<thead>
<tr>
<th>PLASTER</th>
<th>GYPSUM</th>
<th>GYPSUM</th>
<th>PAINTED</th>
<th>WOOD</th>
<th>GYPSUM</th>
<th>BRICK AND</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Gypsum</strong></td>
<td><strong>225-240</strong></td>
<td><strong>225-240</strong></td>
<td>105-135</td>
<td><strong>180-210</strong></td>
<td><strong>235-255</strong></td>
<td><strong>165-200</strong></td>
</tr>
<tr>
<td>Neat Plaster</td>
<td>Sanded 1:2</td>
<td>Sanded 1:2</td>
<td>Sanded 1:2</td>
<td>Sanded 1:2</td>
<td>Sanded 1:3</td>
<td>Sanded 1:3</td>
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<tr>
<td>Sanded</td>
<td>75-80</td>
<td>75-80</td>
<td>35-45</td>
<td>60-70</td>
<td>45-55</td>
<td>45-55</td>
</tr>
<tr>
<td>Wood</td>
<td>115-120</td>
<td>115-120</td>
<td>55-65</td>
<td>90-100</td>
<td>45-55</td>
<td>45-55</td>
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<tr>
<td><strong>Concrete</strong></td>
<td>Paper Bonding Pi. 100 Lbs.</td>
<td>Paper Bonding Pi. 100 Lbs.</td>
<td>Paper Bonding Pi. 100 Lbs.</td>
<td>Paper Bonding Pi. 100 Lbs.</td>
<td>Paper Bonding Pi. 100 Lbs.</td>
<td>Paper Bonding Pi. 100 Lbs.</td>
</tr>
<tr>
<td>Finishing</td>
<td>1600 square yards with 2 tons of hydrated lime</td>
<td>250-275 square yards</td>
<td>300-400 square yards</td>
<td>400-500 square yards</td>
<td>90 to 120 square yards depending on smoothness of concrete surface</td>
<td></td>
</tr>
<tr>
<td>Keene's Cement</td>
<td>400-500 square yards</td>
<td>90 to 120 square yards depending on smoothness of concrete surface</td>
<td></td>
<td></td>
<td></td>
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</tbody>
</table>

**Sanded 1:2 equals 1 part plaster 2 parts sand by weight. Sanded 1:3 equals 1 part plaster 3 parts sand by weight.**

**FINISH PLASTERS**

Finish coat plasters applied to base coats provide the surface for finish wall or ceiling decoration. They are either factory-prepared, requiring only the addition of water on the job, or they may be job-mixed by blending lime-putty and gauging plaster or lime putty and Keene's Cement.

**Portland Cement Base Coat Plaster**

Portland cement, with the addition of lime to provide working qualities and water resistance, is frequently mixed with sand and water to form a plaster mortar. It is chiefly used as a base coat for exterior stucco and in places subject to excessive moisture, such as swimming pools, showers, and steam rooms. It is also used where an extra hard base coat is desirable and as a back-up material for ceramic tile.

Such plaster is relatively unplastic and hard to apply, is consequently costly. It must be kept damp to assure proper cure and prevent drying out and cracking. Several days' delay between coats is necessary to insure curing.

makes possible a continuous bond to concrete surfaces. This plaster should only be used on rough concrete that is properly prepared. It should never be applied to smooth concrete. Maximum thickness including finish coat should not exceed 1/2-inch on ceilings and 3/4-inch on walls. If additional thickness is required, metal lath must be properly secured to the rough surface before plastering.

Monolithic concrete surfaces should be brushed clean of all dust, loose particles and foreign matter. Any laitance or efflorescence should be removed by washing with 10 per cent solution of muriatic acid and water. Grease or form oil should be removed with naphtha spirits. If surfaces are not rough enough to provide necessary mechanical bond, they should be hacked or bush-hammered, or a dash coat of Portland cement grout composed of 1 part of cement and 1 ½ parts of fine sand, mixed to a mushy consistency, may be applied. Keep this coat damp for at least two days immediately following application and then allow to dry. Before applying plaster, the surface should be evenly dampened to aid proper suction.

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"Buy Bostwick" again and again

Bostwick Corner Bead and Cornerite! Wings are formed at the proper angles to fit corners snugly, and special machines assure wings with flat surfaces. Heavy shipping cartons eliminate bent wings caused by shipping, warehousing and delivery. Bostwick bead and cornerite make easier-to-plaster corners than most other corner products.

**THE BOSTWICK STEEL LATH CO.**

102 HEATON AVE • NILES, OHIO
They are normally applied in thicknesses of 1/16 to 3/8 inch. They are selected by the builder according to job requirements—texture, color, hardness, sound absorption and type of basecoat used.

**White Coat**

Finish lime putty into which is blended gauging plaster (gypsum) is known as “white coat.” This is the most widely used finish coat because of its good working qualities, whiteness, economy, and ability to take any form of decoration. Usually it is troweled to a smooth, hard finish over a gypsum base coat. With the addition of sand, it is suitable for sand-float finishes.

Finishing limes are of three types—quicklime, normal hydrated lime, and double hydrate. Each requires specific handling in slaking or soaking to produce a good finishing lime putty.

Gauging plasters are carefully ground and screened to just the right sizes of particles to make this plaster quick-setting and easy to blend with lime putty. They are available in either “slow set” or “quick set” types, making it possible for the workman to use whatever material best suits him. Both white and gray gauging are available in both the slow and quick set types.

Gauging plaster is added to the lime putty in proportion of one part of dry gauging to not more than three parts of lime putty by volume, or one part of dry gauging to not more than two parts of dry hydrated lime by weight. After the gauging plaster is sifted into the lime putty and allowed to soak for a few minutes, the materials are thoroughly blended to avoid gauging streaks and to provide uniform density in the finish coat.

**Keene’s Cement**

Keene’s Cement is a high-strength, white gypsum plaster used with finish lime putty for extremely hard, dense surfaces. The material is slow-setting, can be tempered, and requires more troweling than normal gypsum plaster.

It is used for imitation tile finishes in bathrooms and kitchens or other spots where walls will be subjected to unusual abuse. It is also used as a finish coat for runs and moldings, backing up artificial marble, facing artificial marble, and other ornamental plaster effects.

Keene’s Cement is similar in many respects to a lime-gauging plaster, and should be used wherever greater resistance to moisture, greater surface hardness and greater resistance to abrasion are desired. For medium hard finish, mix in proportions of 50 lbs. of dry hydrated lime (100 lbs. lime putty) to 100 lbs. Keene’s Cement.

**Prepared Trowel Finishing Plaster**

This is a mill prepared and requires only the addition of water on the job. It is recommended for use over gypsum base coats where extreme hardness and immediate decor is required. Rated the hardest of all finish plasters, it provides protection against the most severe wear. It has roughly twice the strength of ordinary lime-gauging finishes. Nonalkaline, it will not injure paint or decoration, and may be decorated as soon as it has set and dried.

For application, allow to soak for 10 or 15 minutes and then mix to a smooth, lumpfree mortar of desired content. Keene’s Cement is highly hydraulic and requires ready liquid mixing and, if necessary, the addition of pigments to the mix. The Keene’s Cement has excellent fire-resisting qualities and when mixed with gypsum plaster produces a higher strength wall than does vermiculite.

**Acoustical Plasters**

Acoustical plasters are highly sound-absorbent, paintable, and are applied easily over a properly prepared gypsum base coat. Manufactured only in an oyster white color, the finish may be either stippled or stipple-perforated. Applied in two successive coats 16 to 24 hours apart, it eliminates re-scaffolding and saves labor. Mixing and applying directions must be adhered to rigidly.

**AGGREGATES**

Aggregates in the form of sand—and, more recently, perlite and vermiculite—are added to gypsum cement plasters to extend coverage and reduce cost. They also act as a gauging agent to minimize shrinking of gypsum in setting.

**Vermiculite**

This material is mined as mica rock, ground and expanded under heat to lightweight granules for use as a plaster aggregate. It should weigh between 7½ and 10 pounds per cubic foot and comply in gradation with ASTM specification for sand. Walls plastered with gypsum plaster containing vermiculite as an aggregate have lower strength and require a longer period for drying than walls of sand-laid plaster, but are lighter in weight and have greater fire resistance.

Where hard finish coats such as Keene’s Cement are to be used, reduce the proportion of vermiculite to gypsum plaster in the base coat. Vermiculite is proportioned with gypsum plaster on a volume of aggregate to weight basis.

**Perlite**

Perlite is a relatively new lightweight plaster aggregate derived from a volcanic rock. The perlite ore is ground and screened to proper size, then expanded to produce a light gray or white colored aggregate. Perlite aggregate for plastering should weigh between 7½ and 15 pounds per cubic foot, and should meet ASTM C35-39 gradation requirements except that the minimum percentage retained on a No. 100 sieve shall be reduced from 95 to 90 per cent. It has excellent fire-resisting qualities and when mixed with gypsum plaster produces a higher strength wall than does vermiculite.
STRUCTURAL clay products are the oldest manufactured building products in existence. The versatility of these products has kept them prominent in construction throughout the centuries. Brick and tile, in their convenient and adaptable sizes, have fitted into every building innovation. Generally speaking, a structural clay product is a piece of clay which has been cleaned, screened, dried, and burned with intense heat. This treatment gives the unit the strength not only to support its own weight in a wall, but also to support heavy additional loads of roofs, joists, and floors.

Types of Structural Clay Products

There are three general types of structural clay masonry units: solid masonry units, hollow masonry units, and architectural terra cotta.

Solid Masonry Units

Solid masonry units are those whose volume of cores, cells, or hollow spaces does not exceed 25 per cent of the total for the unit. Brick is included in this classification, and most solid masonry units produced commercially are marketed as a type of brick. Brick falls into two general groups—building brick and facing brick. Building brick (or common brick) is used primarily as a structural material where appearance is not a factor. Facing brick is used both as a structural material and for decorative purposes, where color, texture, and freedom from defects which would detract from appearance must be considered.

Building brick is graded by Specification 62 of the American Society for Testing Materials, which covers three grades based on resistance to weathering. Facing brick is graded by ASTM Specification 216. This specification covers two grades of brick based on resistance to weathering and three types of brick based on factors affecting the appearance of the finished wall.

Hollow Masonry Units

Hollow masonry units are those whose volume of cores, cells, or hollow spaces exceeds 25 per cent of the total volume of the unit. Structural clay tile is included in this classification, and covers such types as load-bearing tile, non-load-bearing tile, facing tile, floor tile and others.

Load-bearing tile is used in walls designed to carry superimposed loads and is graded by ASTM Specification C34, which covers two grades based on resistance to weathering. Non-load-bearing tile is used in walls which support only their own weight, such as interior partitions carrying no superimposed load. Non-load-bearing tile is covered by ASTM Specification C56, which includes only one grade, since such units are intended for use where they will not be subject to weathering.

Facing tile may be either in load-bearing or non-load-bearing units designed to be left exposed where surface appearance is of great importance. Therefore, this tile must combine physical properties such as strength and durability with appearance characteristics such as color, texture, small dimensional variations and freedom from surface defects which would detract from the appearance of the finished wall. Facing tile finishes include ceramic color glaze, ceramic clear glaze, salt glaze, and unglazed, the last available in both smooth and rough textured surfaces.

Structural clay facing tile is graded by two specifications, those of the Facing Tile Institute and by ASTM Specification C212. These tiles are produced in two general types—side construction tile designed to be laid with cells in a horizontal position, and end-construction tile designed to be laid with cells in a vertical position.

Architectural Terra Cotta

Architectural terra cotta is a custom-made product and is hand made by molding or pressing, and also made by machine. The latter type, shaped by extruding the plastic clay through a die, is often referred to as ceramic veneer, and is available in large sizes up to 48 inches in one dimension. Terra cotta is used extensively in veneering and ornamentation and is available in an almost unlimited variety of colors, both glazed and unglazed.

Use the Proper Mortar For Structural Masonry

In selecting mortar, evaluate its properties in terms of the situation where it will be used. Properties to be considered include: workability and water retentivity, bond, durability, strength, volume change, and efflorescence. Desirable mortar properties may be found in mortars consisting of a wide variety of ingredients.

Recommended Mortars

TYPE A: one part of portland cement, 3 parts hydrated lime or lime putty, and not more than three parts sand by volume. This is a high strength mortar suitable for general use and recommended specifically for reinforced brick or tile masonry and...
SPANDRELS in skeleton-framed structures should be flashed continuously at beams except when cavity curtain walls are used. In conventional curtain wall construction, flashing should start under exterior facing wythe, extend upward behind facing and over top of spandrel beam, and be turned up 1-inch at face of wall.

plain masonry below grade and in contact with earth.

Type B: one part of Portland cement, one part hydrated lime or lime putty, and not more than six parts sand by volume. Type B mortar is a medium strength mortar suitable for general use in exposed masonry above grade and recommended specifically for parapet walls, chimneys, exterior walls subjected to severe exposures, and also for load-bearing structural clay tile construction.

Type C: one part of Portland cement, two parts hydrated lime or lime putty, and not more than six parts sand by volume. This is a low strength mortar suitable for non-load-bearing walls of solid masonry units, for interior non-load-bearing partitions of structural clay tile, and for load-bearing walls of solid units in which the loads developed do not exceed 100 psi and where exposures are not severe.

Structural Clay Masonry Walls

Types and Uses

Structural clay masonry walls are usually classified according to types of construction, such as solid masonry walls, hollow walls, cavity walls, faced or composite walls, or veneered walls.

Solid Masonry Walls

These consist of masonry units laid with the joints between units filled with mortar. They may be built either of solid or hollow masonry units in any required thickness for load-bearing or non-load-bearing construction. Solid brick walls are one of the oldest types of masonry construction known to man. Such walls are highly fire-resistant and are capable of carrying extremely heavy loads—both compressive and lateral.

Hollow Masonry Walls

Hollow masonry walls are built of masonry units so arranged as to provide air spaces in the wall, and in which the facing and backing are bonded together with masonry units. Such walls are usually constructed with solid units, although hollow masonry units may be used. So-called "Rotok-bak" and "All-Rolok" walls are examples. Their advantages are that they are relatively light weight, highly fire-resistant, and yet present much the same exterior appearance as do solid masonry walls.

Cavity Walls

Cavity walls are built of either solid or hollow masonry units arranged to provide a continuous air space within the wall. This air space should not be less than two inches nor more than three inches in width. The facing and backing are tied together with rigid corrosion-resistant metal ties. The continuous cavity reduces the heat transmission of the wall below that of solid masonry walls and provides an effective barrier against moisture penetration. This type of wall is becoming increasingly popular in residential, light commercial, and frame building construction, particularly in areas where resistance to rain penetration is a severe problem.

Faced or Composite Walls

Faced or composite walls are walls in which the masonry facing and backing is of two different types, but bonded so as to exert common action under a load. In other words, the facing material is considered as part of the structural wall in determining the wall thickness. This is perhaps the most common type of wall construction in use at the present time. It is usually built with the exterior facing of brick and the backup of hollow masonry units.

Veneered Walls

Veneered walls are walls having a masonry facing which is attached to the backing but not so bonded as to exert common action under loads. The facing in veneered walls is not considered as being part of the structural walls. Masonry veneering may be brick, facing the architectural terra cotta. Masonry veneer may be attached to walls of masonry, reinforced concrete, or to frame construction.

Tile Partitions

In addition to exterior walls, structural clay products are also used extensively for interior load-bearing and interior non-load-bearing partitions. In addition to their fire-resistant qualities, non-load-bearing partitions of structural clay tile are light, strong, durable, and economical to erect. Partition tile, unless otherwise specified, is furnished with a plaster base finish which may be smooth, scored, embossed, or wire cut. The finish will be in accordance with the manufacturer's standard.

Partition tile is available in thicknesses from 4 to 12 inches. Nominal face dimensions are 12 by 12 inches. It is generally practicable to use 2-inch tile for partitions except for closets, shafts and similar locations, provided these do not exceed a height of nine feet and an unsupported length of six feet. Partitions of 3-inch thickness can safely be used up to 12 feet in height, and corresponding
TOOLEO JOINTS shown 1 and 2 above, produce best resistance to water penetration. No. 3 is "weathered joint" and is satisfactory. No. 4 is the "flush" or "plain cut" joint and is not so desirable. Nos. 5 and 6 are not recommended

increases in permissible height can be obtained with greater thicknesses.

Double partition walls are used extensively where it is necessary to provide space for soil pipes and other utilities. In such cases, the partition walls are constructed with a 4-inch cavity.

Facing Tile Partitions

Structural clay facing tile is used widely in interior partitions or as load-bearing exposed facing material to back up exterior walls. While smooth or textured unglazed facing tile is used in both exterior and interior work, glazed units are used primarily for interiors where color, sanitary finishes, and low maintenance are required. Facing tile manufacturers produce standard fittings and special shapes to meet the requirements of practically all job conditions.

Most of the high-grade, lightburning fire clay facing tile units are furnished in the nominal 4-inch thickness, while the nominal 2-inch thicknesses are used principally for lining or veneering. However, the furring units are particularly adaptable for jobs located at great distances from the plant, where it is usually more economical to use local backing materials rather than facing tile in the full load-bearing capacity as a portion of the structural wall as ordinarily recommended.

Structural Clay Specialties

Manufacturers of structural clay products have also turned their ingenuity to the production of a number of special purpose clay products including flue liners, clay conduit, copings and roof tile, clay pipe, chimney tops, and shingle-like roofing tile. Applications for and installation of these materials have been clearly detailed by manufacturers so that their use is generally fully as satisfactory as that of other structural clay products.

How To Use Flashing

There are two general types of flashing used with structural clay masonry, external and internal. Both types are usually formed of sheet metal or of bituminous membrane materials or combinations of both. Because of its high relative permanence, 16 to 20 ounce sheet copper is usually preferred for the best work, although lead, zinc, and aluminum are suitable if they are protected from corrosion with a coating of bituminous material or lacquer.

External flashing is used to prevent the absorption of water which accumulates on relatively flat intersecting surfaces. This type of flashing usually consists of two members—the base, which forms a part of the covering of a flat surface and turns up against the intersecting vertical surface; and the cap, which is built onto the vertical surface and turns down over the base.

Internal flashing is built into and usually concealed within the masonry to control the travel of moisture and direct it to the exterior surface of the structure.

Where to use either internal or external flashing depends upon where points vulnerable to moisture appear in the structure. Damp checks should be placed about six inches above grade to prevent moisture absorbed from the ground by exterior foundations from traveling upward by capillary action into the wall above. If a termite shield is required to protect floor joists, the damp check can serve as the shield, and should project past the inside face of the wall at least two inches and be bent down at an angle.

Through flashing should be placed under and behind both masonry and wood sills. Ends of sill-flashing should extend beyond the jamb line on both sides and be turned up at least one inch into the wall. The ends of flashing under cast stone sills should be turned up the full height of the sill. For steel lintels, flashing should be placed under and behind the facing material and over the top of the angle. The outer edge of the flashing should be bent down over the edge of DECORATIVE ceramic tile offers opportunities for unusual and beautiful design along with advantages of easy maintenance and cleaning in kitchens, bath and utility rooms.

APRIL 1952
HERE is good workmanship. Bed joint is spread to uniform thickness. Mortar is only slightly furrowed. Head joints are completely filled by buttering end of brick before shoving into place. Slushing partly filled head joints does not do the job!

the steel angle to form a drip. For reinforced tile lintels, the flashing is placed above the lintel.

Spandrels in skeleton-framed structures should be flashed continuously at the beams except when cavity curtain walls are used. In conventional curtain wall construction, flashing should start under the exterior facing wythe, extend upward behind the facing and over the top of the spandrel beam (which is usually the rough floor level) and be turned up one inch at the inside face of the wall. Where columns occur above the beam, flashing should be turned up about six inches around the columns, allowing ¾ inch clearance between column and flashing, with tight bottom joints and the top sealed with mastic.

Efflorescence Can Be Prevented

Efflorescence is an indication of excess moisture present in the wall, and if permitted to collect, may eventually contribute to the deterioration of the masonry. There are two general conditions necessary to produce efflorescence, which is recognized by a white, powdery substance that often appears on the surface of walls: (1) soluble salts present in the materials used to construct the wall; (2) moisture in sufficient quantities to carry these salts to the surface.

Though tests prove that 90 per cent or so of all structural clay products are free from soluble salts in sufficient quantities to cause efflorescence, the safest procedure is to keep moisture out of masonry by the best construction methods possible.

If efflorescence is discovered, the first procedure is to examine the structure for possible places where moisture has access to the masonry. Often, defective flashings or the lack of flashings at vulnerable points, defective gutters or downspouts, faulty copings, or improperly filled mortar joints cause wet walls and contribute to efflorescence. The appearance of efflorescence under windows is evidence that sill or caulk around the window frame may be defective. A single patch of efflorescence on a wall, with no apparent relation to anything else, may mean a defective mortar joint or a projecting course of masonry forming a water table.

To remove the white powdery efflorescence, after the walls have been made watertight with good flashing installations, a stiff scrubbing brush with plain water can be used. Sometimes the efflorescence will disappear after several rains. If neither rain nor plain water removes it, the wall should be well wetted and then scrubbed with water containing not more than one part of muriatic acid to nine parts of water. All frames, trim, and other wood should be protected from contact with the acid solution.

PARGING between brick and backing offers high resistance to water penetration.
IN ORDER to compete successfully in today's market and meet rising costs, the builder must make the most of the labor-saving and money-saving potentialities of modern power equipment and machinery. Costs may be reduced by mass handling of materials, mass production design, fabrication and assembly, and multiple-unit rather than one-at-a-time building operations. Most cost-reducing techniques are possible only with modern machinery—for instance, the precutting of wood structural members, packaging them, and delivering the unit quantities to each job site.

In many instances, special equipment has been designed and built to make particular cost-reducing techniques possible. The economy of mixing concrete at a centralized point for delivery to various jobs throughout a service area prompted the design and development of "transit mix" concrete carriers and mixers mounted on truck bodies. Straddle carriers, fork lifts, and many other equipment units are representative of machines specially built to reduce costs and provide greater efficiency.

The increased speed of present-day building operations is made possible by the use of power equipment and tools. Foundations are dug in hours instead of days. Ready-mixed concrete lets the builder pour as much as can be framed. Power huggies, hoists, and elevators speed materials handling.

POWER SUPPLY EQUIPMENT

Power supply equipment — engines, compressors, generators, and other units which furnish power to operate other tools — is essential to the builder operating in sections away from existing power lines.

Many equipment units such as mixers, hoists, vibrators and the like are operated by built-in gasoline engines. Separate gasoline and Diesel engines which may be used to supply power to various units as needed will find use in many locations. Saws, light mixers, generators, and other tools which do not have built-in engines may be efficiently powered by a separate engine.

The recent development of the small, light, air-cooled, one- or two-cylinder gasoline engine has opened up new applications of this source of power. It frees vibrators, surfacers, flexible shafts, and other tools from the expense of running wiring. Operation is reliable and simple, and repairs are easily made on the job. In sizes from ½ up to six or eight h.p., this type of engine does many jobs at low cost.

Four and six cylinder gasoline and Diesel engines are the general "work horses" of the builder. Compressors, saws, hoists and cranes will use this type of power. The gasoline engine gives high horsepower for its weight, while the Diesel may be preferred for less temporary locations because of its lower operating cost.

Portable electric generators permit the operation of all types of electric tools away from power lines. Sizes run all the way from 500 or 1000 watts up to heavy-duty 10 to 50 KW units for complete lighting and powering of large projects. Generators may be used to power radial saws, drills, and other power tools, and are easily moved around as needed. In many instances, it is cheaper to provide a separate generator than to incur the expense of having the power company provide service, and then run wiring around the job. By making electric power available anywhere, when it is needed without delay, the portable generator saves the builder time and cuts costs.
is one of the outstanding examples of the creative ability and engineering skill of equipment manufacturers. No matter what the problem of earth digging, moving, or handling, there is a machine that will do it quickly and cheaply.

The basic unit around which many types of earth-moving equipment are built, is the crawler tractor, either gasoline or Diesel powered. Forty to 175 h.p. ranges give ample power. With the addition of a front-mounted blade, the unit becomes the bulldozer, most efficient in clearing underbrush, small trees, and in leveling ground preliminary to construction. The same machine returns to the job site to do final grading work.

A scoop bucket mounted at the front of the tractor gives the front-loader or "high lift." This versatile combination will dig shallow foundations, either carrying the spoil to the side for later use as back-fill, or loading it into trucks for removal. It can also be a versatile materials handler. Aggregates, common brick, cement, roofing materials and other bulky products are picked up, lifted, moved, and dumped quickly and cheaply. The front-loader tractor can work in limited space, and turn around in its own length. An idea of the usefulness of these machines may be seen in the experience of one contractor who used his high-lift 4,000 hours in one year—double the normal year's working time.

Large-scale housing projects may often require moving of great quantities of earth for grading and leveling. The scraper earth-mover, mounted on rubber tires and drawn by a tractor, both digs the dirt and hauls it away. Two- and four-wheel models match the power capacities of the tractors and the job requirements.

The power shovel digs foundations, trenches for sewer and water piping, loads the dirt for removal or back-fills, and doubles as a bulldozer, crane, and tractor. Typical sizes used in building construction have 3/4-yd. and 3/5-yd. capacities. Larger sizes up to three-yard capacities may be used in heavy construction excavating. The "back hoe" type of bucket is now most generally used for foundation work. Clamshell buckets may be used or a crane boom may be mounted so that the same unit may do many different types of work at varying stages of construction.

The power shovel is generally mounted on crawler-type tractor treads. However, truck-mounted units are becoming popular because of the speed with which they may be moved from one job to another. Stability for truck shovels and cranes is attained with outriggers which are swung out or extended and supported by jacks, taking the strain off the truck tires. A variation on the usual drum and winch style of operation is the hydraulic type in which digging, lifting and dumping are actuated by hydraulic cylinders.

The long wheelbase grader is most commonly thought of as a road builder's tool. However, the contractor who undertakes large-scale housing developments finds use for these not only for road construction and maintenance but also for general grading and leveling of ground.

Many different types of machines are available for trenched and footing digging. Caterpillar treads or rubber-tired wheels permit use in all types of ground. Different widths of blades and shapes of digging points handle soft or hard soils, rocky or frozen ground. Digging attachments are available for jeeps, tractors, and crawler-type machines. Self-contained and powered machines may dig either from the end or side. Special pipe-trenching machines also may have a boom for lowering the pipe into the ground as the trenching progresses. Earth-boring machinery for digging test holes, footings, and shallow wells is made both as attachments for machines and as self-operating units.

Rollers and tampers for final grading of the site after construction is completed may be required in large-scale work. They may also be needed for site preparation of loose soils for slab floors in ranch-type houses.

PORTABLE ELECTRIC GENERATORS provide power for saws, drills, and other tools on the job. Unit shown can be carried by one man, is spring mounted to reduce vibration.

The familiar air compressor powers the jackhammer for breaking out concrete, opening up pavements, digging in hard or frozen ground. Many other tools may be used when compressed air is available—caulking and chipping hammers, nut runners, and, of course, spraying equipment. Compressors are made in many sizes and include large units capable of handling many jackhammers at one time, two-wheel trailer-mounted type for one gun or hammer, and portable electric motor-operated models for spray work.

Transformers are a power supply equipment unit that may be required by the builder who must provide 110-volt current from lines having 220 or 440 volts; occasionally, a transformer will be needed to operate a 220-volt motor from 110 volt lines. If this is done, precautions should be taken against overloading the existing wiring.

SITE-PREPARATION EQUIPMENT

The vast array of site-preparing equipment—bulldozers, graders, shovels, trenchers—offered to builders is one of the outstanding examples of the creative ability and engineering skill of equipment manufacturers. No matter what the problem of earth digging, moving, or handling, there is a machine that will do it quickly and cheaply.

The basic unit around which many types of earth-moving equipment are built, is the crawler tractor, either gasoline or Diesel powered. Forty to 175 h.p. ranges give ample power. With the addition of a front-mounted blade, the unit becomes the bulldozer, most efficient in clearing underbrush, small trees, and in leveling ground preliminary to construction. The same machine returns to the job site to do final grading work.

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CONCRETE EQUIPMENT

The increasing use of concrete and cement products in the building industry and the advances in concrete technology have been accompanied by an equally rapid development of machinery and equipment for mixing, handling, and finishing concrete and cement.

Concrete mixers range in size from three cubic feet up. One- or two-bag models are most popular with builders of small homes, although smaller mixers may be used for footings or other small pours such as sidewalks. Modern mixers for the small home builder include many refinements and improvements. Roller bearings contribute to longer life. Power-loading hoppers eliminate wheeling barrows up ramps, and make for faster operation. Better gasoline engines minimize delays from power plant failure. Rubber tires make moving from job to job easier.

Special types of mixers are made for paving work, having a traveling discharge bucket on an extended
Get Greater Efficiency from Power Tools

There's no doubt about it, long electric cables eat up valuable power... which is bad for you and bad for your tools. This loss of power results in loss of tool efficiency... loss in production per hour. It puts a strain on the tool's motor; causes quicker dulling of a tool's cutting edge. It results in more down-time for costly repairs to tools.

You can eliminate this expensive waste by operating your tools with a Homelite Carryable Generator. Without delay, without trouble you can set your Homelite right where your tools are operating. No long cables will be necessary. You will get the power you need to run your cost-cutting electric tools at peak efficiency, at all times. Write for free demonstration.

Homelite Field Service
Keeps your Homelites on the go
At all times Homelite Factory Branch Organizations are ready and equipped to give you fast and efficient service on Homelite Generators, Pumps, Blowers or Chain Saws. Another Homelite plus,

Homelite Corporation
504 Riverdale Avenue • Port Chester, N.Y.
Another type of mixer is the transit mix unit, a rotating drum carrier mounted on trucks for transporting concrete from a central mixing plant directly to the job. Transit mixing and carrying equipment saves the contractor time and money. A centralized mixing plant can often purchase sand, gravel, and cement in quantities (saving on hauling costs) and deliver mixed concrete to the job as cheaply as the builder can purchase the unmixed materials. The mix is in many instances poured directly from the truck into the forms by chutes, a further saving in labor costs.

The low price and high structural quality of concrete block are made possible by modern, efficient concrete block machinery. Although the builder will generally buy these blocks, some contractors specializing in this type of construction may find it profitable to operate their own concrete block equipment, deriving additional income from the sale of the material to other builders.

Pneumatic concrete applicators have been developed to a high point of efficiency. Cement cost, stucco, and plaster are interchangeably handled by the same machine.

Concrete buggies having pneumatic tires, with the load balanced over the axle, have replaced the wheelbarrow. For large projects, power-driven buggies handle up to a yard at a load, doing the work faster and cheaper.

Gasoline engine or air compressor vibrators may be used when pouring columns, slabs, or footings. Air pockets are eliminated, a more homogeneous mix is obtained, and a harder, denser concrete is the result.

Troweling machines operated by gasoline engines do the preliminary work of finishing concrete surfaces much faster than by hand, and by giving a more thorough finishing, produce a harder, more wear-resistant surface.

Recently developed techniques for improving the quality of concrete and extending the application of its uses have been made possible by the special machinery for their use. Vacuum elimination of excess water from concrete slabs, in which a vacuum blanket is placed on the slab before finishing, and the excess moisture drawn off by a vacuum pump, produces a concrete which is much harder than conventional pours. In addition, it requires less finishing time and may be placed in use sooner.

Prestressed concrete, in which reinforcing rods or wires are placed under tension either after or before pouring, permits the use of much thinner sections without support. Special jacks and other prestressing equipment make such techniques possible.

CORRECTLY SIZED EQUIPMENT for the job to which it is assigned is always important. It is costly to use a small unit for a heavy job or a heavy unit on a small job.

HEAVY HANDLING EQUIPMENT

The fork lift truck is fast becoming one of the most popular devices for handling materials. Load capacities are from one to ten tons. One fork lift can do as much work unloading, handling, and moving as five to fifteen men can do working by hand, and for less than the day's pay of one man. The variety of materials that can be handled more efficiently by fork lifts is limited only by the ingenuity of the operators in palletizing the loads. Brick, bags of cement and plaster, tile, pipe, mortar and plaster in box carriers, lumber, and practically any building material can be handled efficiently at low cost.

The straddle carrier is a most efficient handling unit for lumber, pipe.

(Continued on page 516)
New Ultra-modern Low-Friction truck engines give you

Gas Savings **UP TO 14%**

**Designed for today's Speed Hauling needs!**

New LOW-FRICTION design
LIBERATES POWER ordinarily held "captive" by engine friction! IT SAVES GAS!
It saves wear!

Good news for truck users! Ford's new, ultra-modern LOW-FRICTION truck engines break away from the traditional "European" long-stroke piston design. They introduce a friction-reducing short-stroke in three completely new engines in Ford Trucks for '52.

Ford Low-Friction design incorporates new direct-breathing OVERHEAD-VALVES... gives you new HIGH-COMPRESSION, for extra wallop to meet today's Speed-Hauling needs. Here's truck engineering that your Ford Dealer will be proud to tell you more about today!

**NEW LOW-FRICTION DESIGN**
OVERHEAD VALVES for deeper direct "breathing"!
HIGH-COMPRESSION punch with regular gas!
SHORT STROKE cuts piston travel up to 20%!

Friction reduced in many ways: Autothermic Pistons have built-in clearance control. Precision-molded Alloy Crankshaft cuts friction and wear at journals. New Full-Flow Oil Filter screens every drop of oil every time around. Result: Up to 30% cut in friction "power-waste"... the big reason why Ford can promise gas savings up to 14%!

**FORD TRUCKS for '52 cost still less to run!**

**APRIL 1952**
Avoid hidden losses... Are you getting the most out of your construction equipment?

<table>
<thead>
<tr>
<th></th>
<th>Yes</th>
<th>More or Less</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Do you have and use a regular, systematic schedule for inspection of all equipment, both in the shop and on the job?</td>
<td></td>
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<tr>
<td>2. Do you consistently use preventive methods of maintenance, and see to it that equipment is repaired before a breakdown occurs, rather than waiting until a machine must be taken out of service?</td>
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<tr>
<td>3. Do you have a regular procedure for lubricating all equipment at correct intervals, using lubricants as recommended by the manufacturers?</td>
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<tr>
<td>4. Is equipment properly protected, both at the end of the day's work and when in idle storage, against rain, dirt, snow, freezing.</td>
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<tr>
<td>5. Do you make sure that each worker using equipment understands the operation, normal care, and maintenance of the machines?</td>
<td></td>
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<tr>
<td>6. Do you use adequate safety measures at all times for any equipment which is in any way hazardous to the operator?</td>
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<tr>
<td>7. Do you have full insurance coverage on your equipment against all possible hazards?</td>
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<tr>
<td>8. Do you guard against over-loading equipment, operating at greater than rated capacities or faster than normal speeds?</td>
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<tr>
<td>9. Are machines shut off when idle for longer than a few minutes, or unattended for any length of time?</td>
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<tr>
<td>10. Do you keep replacements such as spark plugs and belts on hand, and have prompt sources of supply for other repair parts which might be needed?</td>
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<tr>
<td>11. Are foremen and superintendents instructed on the procedure for getting prompt repair parts and service when needed?</td>
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<tr>
<td>12. Do you carefully plan your work to eliminate moving machinery around too much from one job to another?</td>
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<tr>
<td>13. Do you select equipment which is adaptable to many operations, as against &quot;one job&quot; machines, all other factors being relatively equal?</td>
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<tr>
<td>14. Is responsibility for inspection, lubrication, adjustment, and repair of equipment clearly established?</td>
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<tr>
<td>15. Are you &quot;equipment minded,&quot; keeping up with new developments, and seeking new uses and applications of your present equipment to different types of houses, and different construction techniques?</td>
<td></td>
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</tbody>
</table>
NOW—an All-Purpose Tractor for Builders

— Speeds every phase of construction — from breaking ground to final landscaping.
Easily transported on trailer.

Allis-Chalmers HD-5G Tractor with Quick-Change Attachments

No end to the usefulness of the HD-5G Tracto-Shovel and its 13 interchangeable attachments. Ask your Allis-Chalmers dealer to show you a '5G at work or write us for literature giving complete information.

Digs footings, trenches with trench-hoe attachment. Cuts narrow, flat-bottom ditch to depth of eight feet. Does precision work on footings, any small excavations.

Handles lumber, pipe, etc.
— lifts, loads, stacks or skids materials with lift fork. Works anywhere, including muddy or rough ground.

Lifts shingles, brick, other materials to roof height to save major time loss on small-home projects.

Excavates basements with straight sides, level bottoms — moves and loads materials of all kinds with Tracto-Shovel bucket. Ripper on rear of tractor increases digging efficiency up to one third in any kind of soil.

Levels, backfills, does landscaping, using either blade or bucket. Builds driveways — clears out trees, underbrush, big rocks — saves time on all kinds of jobs.

HD-5G Tractor has 40 hp., weighs 16,200 lb. with 1-yd. standard bucket. There are three other models of A-C tractors with 2-, 3-, and 4-yd. standard buckets for doing more work — faster.
or other lengthy materials. The load is automatically picked up and lowered, a tremendous saving in manpower and time in handling. Pre-stacked loads can be picked up in the yard, delivered to the job, unloaded, and the carrier arrive back for another trip in less time than it would take for men to load a conventional truck by hand. Straddle carriers handle loads up to twenty tons and five-ton carriers can operate in close quarters with a turning radius of only three feet.

For lifting steel, concrete, and prefabricated sections the crane is indispensable. The small builder will use a combination crane and power shovel. Changing from one operation to the other takes only an hour or so, and idle time is held to a minimum. Heavy cranes are mounted on caterpillar treads, and tractors of this type have a variety of crane attachments. Booms up to 60-foot length may be used.

The wheeled tractor and track-mounted crane are more versatile units for the builder of small homes where the weight-handling requirements are not so great. A rubber-tired tractor with crane boom may be used with a bulldozer blade for light digging and excavating, and with a front-end loader bucket for handling general materials on the job. Track-mounted cranes move quickly from one job to another, and with the boom removed, the truck may be used for general hauling.

While the typical crane is winch operated, a track-mounted model using hydraulic cylinders as the power-actuating mechanism is meeting with favor for many operations. Hydraulic control is smooth, and heavy loads are handled with ease.

The front-loader, previously mentioned, is one of the more versatile materials-handling units. Sand, gravel, and other loose materials are picked up, moved, and dumped with minimum time and effort. The front-loader is well adapted to handling common brick, roofing materials, and (with a fork lift) lumber, pipe, and other pulleable loads. The relatively low cost of front-loader attachments for tractors or bulldozers makes them an attractive buy.

Many devices have been built or adapted for specialized operations. Concrete block, large concrete pipe and sewer tile, reels of cable, water main, and practically all building components otherwise awkward to move are easily handled with machinery designed "to fit."

**LIFTING EQUIPMENT**

Hand-carrying of components up the ladder is rapidly vanishing from the building scene. The hod carrier was replaced by a hand-winch which lifted a wheelbarrow at a load. A gas engine or electric motor took the hand labor out, and lifted more per load. The continuous belt elevator lifts more, quicker, and eliminates the weight of the wheelbarrow and the lost time for return trips.

The portable elevator with two cages, an empty going down as a load goes up, is the general work horse for lifting brick, stone, and mortar to the second and third floors. Of either wood or steel, powered either by gasoline engine or electric motor, it is quickly put up and taken down, and readily moved from job to job. Two buildings may be served by one hoist set up between them. In row-house construction, where buildings are close together, planks may be laid from one to another so that one hoist can handle as many as three or four units. A recent improvement in this type of hoist is a self-contained sixty-one foot hoist that can be moved from job to job without disassembly.

An interchangeable wheelbarrow platform and concrete bucket are provided, and one-ton loads are safely handled. The whole assembly is on a skid so that it can be moved from one spot to another on the same job.

An alternate type of general hoist is the gasoline-powered winch which...
Effective ditch work, including cleaning and reshaping, is only one of many key road jobs on the long list of the Dearborn Road Maintainer.

It's built like a motor grader, with a 14-foot wheel base, for good blading performance. Weight concentrated on rear wheels, and the strong frame for firm circle support, contribute to blading without "chatter".

Powered by the Ford Tractor, the Dearborn Road Maintainer proves unusually capable at repairing frost-heaved roads—smoothing rutted or "washboard" surfaces—maintaining berms—helping spread surfacing materials.

Full range vertical blade positioning is under responsive hydraulic control, energized by a pump that takes power directly from the Ford Tractor's crankshaft. This Maintainer, with an approximate weight of 6,900 lbs., can put a pressure of 3,500 lbs. on its 8-foot blade.

This unit's fitness for maintenance and moderate grading uses, plus its reasonable price, offer some remarkable advantages to users!

For complete information, write Dept. I, Dearborn Motors Corporation, or get in touch with your nearby Ford Tractor dealer.
THIS CONCRETE APPLICATOR has a dual-compartment pressurized hopper for continuous operation. Adjustments for air and water pressure can be made while the unit is in operation, and different materials can be handled without changing parts.

This is useful on small jobs, or for roofers, chimney work, etc. Typically, a 5 h.p. motor and winch form a unit that can be moved about by one man, and will lift up to 750 pounds.

Other types of winches are mounted on trucks, powered either by the engine or a separate unit. The popular jeep winch operates from the front of the vehicle.

With all types of elevators, winches, and other lifting equipment, proper safety precautions must be observed. No load beyond the rated capacity of the hoist should be handled. Hoists and winches must be securely anchored. Cables should be inspected regularly and kept lubricated. Men should not be permitted to ride up or down elevators not approved for passengers, and no passenger hoist should lift by only one cable. Loads should be properly secured. Slings, grapples, and hooks must be used. And only workmen properly instructed and authorized should be allowed to operate hoisting equipment. Workmen should be cautioned against walking under a suspended load at any time.

TRUCKS

Trucks play so important a part in the construction industry that a listing of their use would cover every building operation. Trucks, of all sizes, from the half-ton pick-up to the largest trailer assemblies, are used in one way or another in the construction industry. Special body designs, a wide variety of attachments for special work, dual axles and special gear ratios for unusual load and road conditions—all are ways in which the automotive industry has kept pace with the builder in developing equipment to meet specific needs.

Special body designs for hauling materials extend the truck's utility, and permit the handling of all types of materials with greatest efficiency. Dump bodies for hauling earth, sand, gravel, and other bulk loads give greatest load capacity and eliminate manpower in unloading. Partitioned dump bodies for concrete aggregates let the driver dump a mixer load of sand and gravel at a time, thus letting one larger truck haul three or four unit loads at one trip. Dump bodies for excavating are strongly braced to withstand the abuse of earth being dropped by shovels and buckets, and have extensions over the cab for driver protection.

Lumber-handling bodies carry the load on rollers, so that the load may be unrolled from the truck onto the ground as a unit rather than unloading one piece at a time. Framing for a house typically loaded in reverse order, so that the first pieces to go in place are on top of the load, eliminating re-stacking.

Various other special bodies are designed for hauling plate glass, roofing materials, etc. Heavy "goose-neck" trailers are used for moving bulldozers, shovels, and cranes from one location to another. Many bodies are denoumtable and interchangeable, so that the same truck chassis may...
a STRAIT-LINE is Your Shortest path to Profits!

Digs in Rear... or Digs in Front
AND, IT MULTIPLIES TRACTION... SAVES TURNING MAKES STEERING EASIER... INCREASES STABILITY

Push-Tilt assures fuller buckets even in fine plaster sand.

It takes plenty of traction to move from bank to truck in rough going like this. Rear-carried bucket makes it possible. And, in hard banks, the extra traction and Push-Tilt give you the same fast, profitable loading.

But here is its Biggest Advantage... ADDED TRACTION FROM REAR-CARRIED BUCKET

An Oliver Industrial Wheel Tractor and Strait-Line Loader is the biggest profit asset for any loading operation. It digs in back... or digs in front... and loads in front. No time-wasting turning or backing required.

Here's proof. These photos were taken loading out plaster sand, so fine it squirted out through a ten-penny nail hole in the truck body in a stream 4 inches long. Despite this difficult going, the tractor and Strait-Line wheeled its bucket loads upgrade without spinning. It ran back from truck to bank with force. This extra traction for difficult conditions is created by the rear carried bucket.

This is a condition where rear digging solved the problem. In fact, under most conditions, the operator can do more with rear digging.

Why not check the Oliver Industrial Wheel Tractor Strait-Line for your loading.

THE OLIVER CORPORATION

A complete line of industrial wheel and crawler tractors.

APRIL 1952
LIGHT MOBILE CRANE is a versatile tool for loading and unloading, for erection of steel and panels.

Power take-off pulleys are supplied as an optional accessory on many light trucks for operating separate saws, pumps, compressors, etc. Hydraulic lift gates take the heavy labor out of unloading bathtubs, heaters, and similar heavy units, and also reduce breakage.

SCAFFOLDING,
SHORING, FORMS

The labor and expense of building scaffolding, forms, shoring, ladders, and horses on the job have been greatly reduced by the use of ready-made units.

Steel scaffolds have kept pace with the requirements of modern construction, their use proving advantageous in a variety of jobs. Among advantages pointed out by manufacturers are low erection costs, high degree of safety, permitting fast and efficient work; easy inspection and reconditioning; and complete recovery of materials.

A recent development for scaffolds is the "mason frame," designed to improve bricklaying efficiency. Other innovations are a frame brace lock to reduce erection and dismantling time, and an overhead protection attachment.

POWER-OPERATED CONCRETE BUGGY has large capacity, speeds production, cuts material-handling costs.

THE CRANE ADAPTOR shown above converts back hoe machine to crane in five minutes on the job, is used for lowering pipe or valves into the ditch, and is interchangeable with a fast back-fill blade using same boom and stick.

In general, manufacturers classify steel scaffolds into two principal types—"coupler" and "sectional." Both are designed for erection from the ground up as construction progresses.

The coupler-type has four basic components—interlocking steel tubes, two types of couplers, and a base to carry the load. Standard couplers are used to carry the horizontal tubes, while couplers adjustable to a desired angle are used with the diagonal tubes for bracing.

Basic units of the sectional type of scaffold are welded steel prefabricated frames which can be assembled without tools for use with a large variety of structures. Their versatility is increased by such auxiliaries as end frames, trusses, ladders, brackets, and other devices. They can (Continued on page 522)

POWER-OPERATED CONCRETE BUGGY

CHAIN FALLS makes light work of lifting heavy beams or pipe, provides safety by holding load at any point.

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HOW POWER TRENCHER SAVED FOR ONE BUILDER

The table below contains figures taken from the books of an eastern builder who carefully kept comparative costs between his old hand method and the mechanical system of trenching.

<table>
<thead>
<tr>
<th>TRENCHER</th>
<th>Original</th>
<th>Average</th>
<th>Cost per</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cost of trencher per house</td>
<td>$6,084.64</td>
<td>3 years</td>
<td>$2,038.18</td>
</tr>
<tr>
<td>House Foundation:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Average three houses per 8 hour day</td>
<td>$2,028.18</td>
<td>192</td>
<td></td>
</tr>
<tr>
<td>Operator and helper average</td>
<td>$3.00</td>
<td>8.00</td>
<td></td>
</tr>
<tr>
<td>Loading fill and cleaning rubble</td>
<td>$3.00</td>
<td>1.00</td>
<td></td>
</tr>
<tr>
<td>Septic tank laterals:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Average of 3 hours per house</td>
<td>$2,000.00</td>
<td>8.00</td>
<td></td>
</tr>
<tr>
<td>Operator and helper</td>
<td>$3.00</td>
<td>3.15</td>
<td></td>
</tr>
<tr>
<td>Repairs, $604.80 per year</td>
<td>3.15</td>
<td>192</td>
<td></td>
</tr>
<tr>
<td>Estimated average cost of trencher per house</td>
<td>$34.50</td>
<td>520</td>
<td></td>
</tr>
</tbody>
</table>

MANUAL LABOR

Foundations, one house average: 6 men 1 day 48 hours $67.20

Laterals, average 4 men one day 32 hours 44.80

Loading fill and cleaning rubble, average 2 men 3 hours each 6 hours 8.40

Payroll taxes on $120.40 labor 5.78

1-1/2 yards more of concrete an account of width of trencher (men cannot dig a 12 inch wide trench) at $10.75 a yd 16.13

Total $142.31

Savings Per House $107.81

AMERICAN BUILDER
How to haul BIGGER PAYLOADS

The more you haul per trip, the lower your delivery costs will be—so you're interested, of course.

And the best way to be sure of hauling more lumber and building supplies per trip is to get a truck that fits your job—a Dodge "Job-Rated" truck. There's one factory-engineered to meet your needs... save you money... last longer.

Thanks to Scientific Weight Distribution, you can carry far bigger loads on your Dodge "Job-Rated" truck—without overloading. What's more, every unit that carries the load—such as frame, axles, springs, wheels, tires and others—is engineered especially to shoulder your loads with plenty of brawn and muscle!

Start hauling those bigger payloads in a Dodge, and you'll also discover that gas, oil and maintenance costs hold to a low, low level the year 'round!

But this is only part of the story. Why not get the full story on Dodge "Job-Rated" trucks... how you can make more trips per day, and save dimes and dollars in the doing? Visit your nearby Dodge dealer.
Mr. Customer!

Here are 3 important questions to ask yourself when buying sawhorse brackets:

1. Will the sawhorse brackets take dressed, as well as common lumber? You can be sure if you get Spee-Dee or Dalton brackets.

2. After using the assembled sawhorse, will it fall apart when lifted to be moved? Is it like the chain whose legs drop off when lifted? Both Spee-Dee and Dalton brackets are designed to hold the parts rigidly so they can't fall out of position—no matter how hard you use the assembled horse, or how much you move it around. With all this, sawhorses can be disassembled on the job quickly, easily for storing, because of the exclusive, patented features of Spee-Dee and Dalton brackets.

3. Do I have to follow complicated instructions to assemble a sawhorse? If you get Spee-Dee or Dalton brackets, use the exclusive patented simplicity, speed and ease of assembly. See the shapes of Spee-Dee or Dalton brackets make them outstanding in their price class.

### NEW Spee-Dee SAWHORSE BRACKETS

A Low-Priced, Quality Bracket Takes Dressed or Common 2 x 4 Lumber No Complicated Instructions to Follow

Wont Fall Apart When Lifted by the Built-in Wing-Nut Locks

For Heavy-Duty, Construction Service—

DALTON FULLY-MECHANICAL SAWHORSE BRACKETS

Convert 5 Pieces of Lumber into a Sawhorse WITHOUT NAILS, BOLTS OR MITERING OF LEGS

Sizes for 1x4's and 2x4's

Uses: Simplicity is the key to fast, easy use. No complicated instructions to follow. Made like Dalton Mechanical Bracket except heavy gauge steel fabricated for strength, have twist of the Wingnut Locks Legs and Rail Rigidity in Place!

BELOW COST on every building job!

Tabular Steel SCAFFOLDING

Get you UP in the world... FASTER SAFER EASIER

OWN or RENT... either way it pays!

Write for literature... ask for bulletin D4

---

THE FORK LIFT TRUCK handles a wide variety of loads efficiently. In lumber yard, fork lift eliminates hand stacking

(Continued from page 520)
Time saved is profit made with JAEGER-engineered machines

Mix more concrete in the time you save with a fast-charging, fast-discharging Jaeger:

5 to 7 seconds charging with Jaeger’s “Skip Shaker” loader, equally fast discharging with Jaeger’s bigger bucket and flight blades, shortens every mixing cycle, gains time for extra batches, bigger yardage every day you work.

No risk of “down time" either, in your busy season. Jaeger mixers roll on chilled Timken bearing rollers and tracks of high carbon steel machined true on the drum, with heavy duty automotive transmissions and bigger engines that have power to spare for years of reliable service. Sizes 6S, 11S, 16S. Also 3½S tilter and non-tilt Auto-Loader with automatic shaking batch hopper. Ask for Catalog M-10.

New 3½ ft Plaster-Mortar Mixer makes you money in 4 ways:

(1) Bigger capacity—3½ ft. instead of 3 ft. (2) Better mixing—4 blades, instead of 2. mix smoother spreading material, fast. (3) Low for easy shoveling (only 34” high); easy to move (only 29” wide). (4) Heavy duty thruout — Timken bearing drum shaft with leak-proof neoprene seal, extra heavy gauge steel drum, automotive transmission, Wisconsin 3 hp engine. Ideal, not only for the small job but for bigger work where 2 small mixers will often give you more flexibility than one large machine.

Jaeger Self-Raising Tower speeds placing, saves labor and accidents:

Assembled on ground, raised by its own power and easily moved as needed on its own skid base, this 1-ton Hoister tower eliminates hodders and scaffolding, operates either material cage or 14 ft. bucket. Standard height 37’, can be extended to 67’. Automatic safety device positively prevents falling should cable break. Get Bulletin HS-1.
KOHLER ELECTRIC PLANTS
Independent Source of Electricity

The job moves faster
PORTABLE electricity eliminates expense and bother of temporary power line hook-ups. Low cost model operates saws, pipe threaders, cutters, electric drills, other tools having universal (AC-DC) motors. Develops 1500 watts. Compact, weighs only 75 lbs. Handles for carrying. Two-wheel, rubber-tired hand truck available. Other sizes, 350 watts to 15 KW. Write for folder 7-E.

Model 1.5M5, 1500 watts, 115 volt DC. Manual control. Length 18”, width 14”, height 21”.

Kohler Co., Kohler, Wisconsin. Established 1873

KOHLER OF KOHLER
PLUMBING FIXTURES • HEATING EQUIPMENT • ELECTRIC PLANTS
AIR-COOLED ENGINES • PRECISION CONTROLS

“TROUBLE SAVERS” for Busy Builders

LADDER JACKS

- ONE-MAN Ladder Jacks adjust to any pitch on either side of the ladder. Takes weight on three rungs.
- RAIL-TYPE Jacks use side rails of ladder for extra safety.

Used by thousands of builders. Write for literature giving information on all money-saving “Trouble Saver” Scaffolding Accessories.

The Steel Scaffolding Company, Inc.
856 Humboldt Street, Dept. AB • Telephone Evergreen 3-5510 • Brooklyn 21, New York

CONVEYORS provide an efficient method of lifting brick, tile, roofing materials to second or third-story level. Extensions are available to adjust the height of the conveyor to the level needed.

5. Never permit any structural member of the scaffold to be removed while it is in use, without permission from proper authorities.
6. Tie scaffold into the building every twenty feet of height and every twenty-five feet of width.
7. Install guard rails and toeboards.

Adjustable shoring consists of a T- or L-head top section and an extendable leg, with adjustable stop points so that any height within the

TWO-SECTION UNIT shows typical construction of hoisting tower and cage. Such towers may be raised to any height, can also hoist concrete in buckets.

THIS STAKE TRUCK is adaptable to a wide variety of hauling work. Model shown above has 1½-ton capacity.
Today — leading architects and discriminating builders use Vibrapac Concrete Masonry for Beauty and Architectural Design. The cozy livability, both summer and winter, plus the economy, lifetime durability, fire safety, insulation value, and low upkeep cost of Vibrapac Concrete Masonry, makes it today's popular building material.

Besser has developed new units, such as floor filler block, pilaster block, window sill block, bond beam block, control joint block and many other accessory units, which have done much to increase the use of concrete masonry construction.

FREE BULLETIN — Soffit Block used as a filler for floors and roof construction has many advantages. Vibrapac plants report greatly increased demand for these units. The fire safety, economy and many other advantages of this type of floor and roof construction are explained in Bulletin No. 77. Write for your copy today.

VIBRAPAC BLOCK — Specified by Leading Architects — Used by Leading Contractors — Sold by Leading Concrete Products Plants

SUPER VIBRAPAC — The modern high production block machine. Produces high quality units in all styles and sizes on Plain Pallets. Fully automatic — no machine operator required — uninterrupted high production — Front Feeding of Pallets.
CONTRACTORS—save money!
Mix plaster and mortar in a MULLER 3 FOOT MIXER

- An investment that will give you better plaster and mortar at far lower costs than old hand methods. Ideal for both inside and outside use. Holds full bag batches of most mixtures.

PRICE $312 (with electric motor)
$330 (with air-cooled engine)

For Metuchen, N.J.
Also available in 6, 9 and 12 cubic foot sizes
Write for name of nearest distributor.

MULLER MACHINERY COMPANY, Inc.
Metuchen, N.J. Cable Address: MULMIX

THE TRANSIT MIX CONCRETE CARRIER is only one of many special truck units developed through close cooperation between truck and equipment manufacturers.

range of the shore may be obtained. Top sections are generally of wood, with the leg of "T" cross-section steel. Combining lightness and strength. This type of shoring is quickly set up and leveled off, and may be removed with more speed and ease than the conventional 4 by 4's and wedges.

Plasterer's and bricklayer's horses of steel are permanent, may be adjusted in height, and are quickly set up and knocked down for moving around on the job or transport to another location. Savings in lumber and labor soon pay for the first cost of this type of equipment.

Prefabricated forms for walls, decks, and columns of both wood and

THE TRANSIT MIX CONCRETE CARRIER

HOISTING TOWER shown above has two cages for rapid handling of men and materials. Hoists may be either gasoline or electrically operated, have capacities up to 2500 pounds

DUMP TRUCK BODIES provide great efficiency in handling sand, gravel, earth, and other loose materials

I've got to hand it to you, Jones, you know more about the Building Business than I thought

Jones gets his information

It isn't what you know that is so important—it's knowing WHERE to go to get the information you need to do a job or solve a problem.

Builders and Dealers keep their AMERICAN BUILDER CATALOG-DIRECTORY handy so they can refer to it frequently.

AMERICAN BUILDER
79 W. MONROE ST. CHICAGO 3, ILL.
Straight-from-the-shoulder facts show you save in every way with CHEVROLET Advance-Design TRUCKS

**FACT No. 1**
COSTS LESS TO BUY
Match a Chevrolet truck against any comparable truck capable of handling the same payloads. You'll find Chevrolet trucks list for less, yet bring you ruggedness, stamina and great features not found in the other truck.

**FACT No. 2**
SAVES MONEY ON THE JOB
Experienced truck operators know Chevrolet trucks cost least to own and maintain. Valve-in-Head economy, in the Chevrolet Loadmaster or Thriftmaster engines, saves on gas. Four-way engine lubrication reduces wear and oil costs. Rugged construction means long life.

**FACT No. 3**
RIGHT TRUCK FOR EVERY LOAD
Chevrolet trucks are factory-matched to your payload and service requirements. You don't buy "too much truck" or "too little truck." Frame, axles, springs, body, brakes and power are balanced for the job.

**FACT No. 4**
KEEPS ITS VALUE LONGER
Records show that Chevrolet trucks traditionally bring more money at resale or trade-in than many other makes. Chevrolet's market value stays up because the value stays in! More proof that Chevrolet is the best truck buy! See your Chevrolet dealer soon.

---

**CHEVROLET ADVANCE-DESIGN TRUCK FEATURES**

**TWO GREAT VALVE-IN-HEAD ENGINES**—Loadmaster or the Thriftmaster—to give you greater power per gallon, lower cost per load • **POWER-JET CARRIERTOR**—for smooth, quick acceleration response • **DIAPHRAGM SPRING CLUTCH**—for easy-action engagement • **SYNCHROMESH TRANSMISSION**—for fast, smooth shifting • **HYPOID REAR AXLE**—for dependability and long life • **TORQUE-ACTION BRAKES**—on light-duty models • **PROVED DEPENDABLE DOUBLE-ARTICULATED BRAKES**—on medium-duty models • **TWIN-ACTION REAR BRAKES**—on heavy-duty models • **DUAL-SHOE PARKING BRAKE**—for greater holding ability on heavy-duty models • **CAB SEAT**—with double-deck springs for complete riding comfort • **VENTI-PANES**—for improved cab ventilation • **WIDE-BASE WHEELS**—for increased tire mileage • **BALL-TYPE STEERING**—for easier handling • **UNIT-DESIGNED BODIES**—for greater load protection • **ADVANCE-DESIGN STYLING**—for increased comfort and modern appearance.

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**CHEVROLET DIVISION OF GENERAL MOTORS, DETROIT, MICHIGAN**

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*APRIL 1952*
SAVETIME
LOWER BUILDING COSTS WITH
MULKEY

ALL-STEEL PORTABLE ELEVATOR
Here's one of many examples how THE MULKEY Elevator saves as much as 40% by cutting time and labor on the job. Shown in action below, a MULKEY 40-ft. Elevator moves 16 concrete blocks per minute up to each individual room on second floor level.

OUTSTANDING MULKEY FEATURES
- Basic unit – 24' long.
- 8' extensions easily bolted on.
- Balanced and portable up to 40' unit.
- One man can handle and operate.
- Handles 750 lbs. concentrated or distributed load.
- 40' unit adjustable from 5' to 28'.
- New Trailer Hitch permits towing by car or truck.
- All steel, electric welded, bridge type construction.
- Power: Either 4 HP gasoline engine or 1½ HP electric motor (normal use).

Write for Prices and FREE Literature today!
SAM MULKEY COMPANY
1621-AB-452 Locust Street Kansas City 8, Missouri

TWO TYPES OF SCAFFOLDING are shown: prefabricated steel units for mason and other construction operations, and hanging scaffold for cleaning and tuck pointing.

OUTSTANDING MULKEY FEATURES
- Basic unit – 24' long.
- 8' extensions easily bolted on.
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Write for Prices and FREE Literature today!
SAM MULKEY COMPANY
1621-AB-452 Locust Street Kansas City 8, Missouri

SELECTION
It goes without saying that the builder who is constructing only ten or 12 homes a year will rent rather than buy such heavy equipment as trenchers, concrete mixers, cranes, and the like. Through his local dealer he can obtain, for the specific job in hand, nearly any kind of equipment he needs. Some builders may find it profitable to follow the

PREFABRICATED STEEL SCAFFOLDING is shown in assembly. Note pulley fitting for raising sections and material, and ladder for safety.

A TRACTOR AND SEMI-TRAILER for hauling cut stone, which incorporates a derrick for loading and unloading.
"TROUBLE SAVER" SCAFFOLDS

Save Time and Man-Power on Light Construction Jobs

Even on small jobs, "Trouble Saver" Sectional Steel Scaffolds are profit-makers for you. Prefabricated frames fit into place quickly and securely. This strong, safe scaffold can be erected and dismantled in minimum time. Indoors and out, it is more efficient than old-fashioned built-on-the-job wood scaffold.

With "Trouble Saver" you erect a scaffold to fit the exact needs of each job. Time-saving and efficiency features include extension legs for levelling and built-in ladders.

Get the facts! Write for Bulletins PSS-15 and PSS-24. See how other contractors use "Trouble Saver".

Distributed by:

- Brick Laying
- Stone Setting
- Chimney Work
- Painting
- Stucco Work
- Sidewall Jobs

Approved by Underwriters' Laboratories, Inc.

MASON TYPE FRAMES

Strong 5' wide, many-purpose mason frames are handy units in "Trouble Saver" assemblies. Separate working and material storage levels are provided for faster, easier work. Rungs may be used as a ladder.
POWER POST HOLE AUGER operated by two men does work quickly and neatly, pattern of the farmer who owns the expensive threshing rig—own the equipment, and rent it out to other builders in the locality. However, any purchase of construction machinery or materials-handling equipment must be predicated upon getting the money back—with a profit—during the estimated useful life of the machine.

Builders who operate on a fairly large scale will frequently find that the convenience and time saved by having the machine at hand when it is needed will offset the added investment by eliminating man hours lost waiting until the equipment is available under a loan or rental arrangement. The key to making efficient use of such heavy equipment is to co-ordinate its activity with other building activities, so that it stands idle as few days a year as possible.

MAINTENANCE

Improper, inadequate, and irregular machine maintenance is responsible for more machine downtime than any other single cause. This is particularly true of the piece of equipment which is used only occasionally. Routine maintenance tasks assume a size out of all proportion to the amount the machine is used. Consequently, normal functions of cleaning, lubricating, and adjusting, are let go "until next time," which may be weeks later. In the meantime oil and grease has congealed or dried out, dust and grit have collected on bearings, and in other ways the machine has deteriorated for lack of care. When it is finally operated, it is naturally subject to break down.

The key to having good machine maintenance is the rigid operation of a simple check-list or tickler follow-up system on which each piece of equipment is listed together with a schedule of its routine maintenance and periodic overhaul requirements. Follow-through on this can save hours and days wasted. Manufacturer's recommendations are usually adequate for routine maintenance operations, and can be incorporated into such a follow-up maintenance system. If the builder will add to his system a centralized responsibility for machine maintenance, things will move more smoothly. It is usually found practical to have one man who functions more or less as a maintenance specialist and who will handle all major maintenance operations.

THE PRIME-MOVER CO., Muscatine, Iowa

THE ORIGINAL POWERED WHEELBARROW

Get the facts and helpful information on the benefits Prime-Mover can bring you. Write today.

THE Bell PRIME-MOVER

nationwide service economical operation maneuverability greater production manpower savings versatility low maintenance cost ease of operation

AMERICAN BUILDER

THIS TRUCK AND TRAILER ASSEMBLY reduced hauling costs to only 31 cents per yard

YOU GET A BIG LOAD OF BENEFITS with the powerful PRIME-MOVER!

Building contractors—large and small—use Prime-Movers—simply because P-M's are valuable machines to have on the job. The 10 cu. ft. bucket carries concrete and aggregates, plaster and like materials. The interchangeable platform with stakes handles large bulk items, 5 H.P. engine with forward and reverse climbs steep ramps.

Building contractors—large and small—use Prime-Movers—simply because P-M's are valuable machines to have on the job. The 10 cu. ft. bucket carries concrete and aggregates, plaster and like materials. The interchangeable platform with stakes handles large bulk items, 5 H.P. engine with forward and reverse climbs steep ramps.
SMALL builders, looking for ways to make their operations more profitable, can well give some thought to the amount of time and effort devoted to managing their business, keeping office records, and handling routine office procedures, as well as to the engineering equipment with which they work.

**Accounting Systems and Record Keeping**

Delegates to the 1952 NAHB convention in Chicago listened to the authors of a book on small-builder accounting which has been published by the Housing and Home Finance Agency. This book gives details on simplified small-builder accounting methods, considers building problems and construction methods, costing, job records, payroll and other procedures.

**Visible Loose-Leaf Binders**

Visible loose-leaf binders have been found practical by many builders for purposes such as recording social security data, keeping customer accounts and prospect lists, purchase records, mortgage data, insurance accounts, bank records, and equipment inventory and depreciation records.

**Visible Card Systems**

Visible card systems are particularly useful for keeping records to which frequent reference may be made. Mortgage data, materials records, bank records, payroll, sales records, and similar information may be recorded and reviewed rapidly with these systems. Most systems protect the visible margin with transparent plastic material which may be color-keyed to signal basic information without referring to notations on the card, and provide for insertion of existing card records without re-entering information on the new card.

**Engineering and Drafting Equipment**

Basic drafting and engineering equipment has not changed radically in recent years. Levels and transits of good quality have improved optical systems with coated lenses, internal focusing on dirt and dust-free inside lens surfaces, ball bearings, and rack and pinion operating mechanisms.

Slide rules, scales, drawing instruments, and similar devices have been supplemented with a number of gadgets to facilitate perspective drawing, house plans with template of plastic with useful shapes cut out, and other tools which combine functions of T-square, straight-edge, protractor and parallel rules.

**Files and Cabinets**

The average person might well think that a file cabinet is just another file cabinet, but this is no more true than to say one house is like another. Primary questions in selecting filing equipment include frequency of reference, permanent or temporary storage, necessity for security against prying or pilferage, need for fire protection, floor and office space available, and investment which the individual builder's operation can justify. Proposals and bids, specifications, contracts, and other valuable papers might well be put in a fireproof file which has passed the underwriters’ tests. Ball-bearing, full-suspension files will work easier, and probably stand up longer than the economy models.

**Duplicating Equipment**

There are three basic types of duplicating equipment commonly available for use in the average small office: stencil, spirit, and offset. Mimeograph has become virtually a generic term, just as "Coke" for...
GADGETS AID EFFICIENCY

Electronic secretary shown above answers the telephone with recorded greeting, puts information and messages on tape for owner. Owner can call in and machine will deliver messages. Automobile telephone shown at right provides 28 calls a month for base charge of $28, more than pays for itself in time saved and convenience of being constantly in touch with the office.

Dictating and Recording Equipment

There are four major types of recording and dictating equipment currently available and of use to the small builder. These include disc, tape, wire, and cylinder-ribbon types, all of which have now become electronic in operation.

Small builders will find such equipment very useful as time savers. When routine correspondence, specifications, job changes, and similar matter can be dictated and recorded for transcription later, the typist can be doing something else while the boss is dictating. In addition, the use of such equipment for conferences with clients where terms and specifications are discussed, and as a means of recording vital telephone conversations so that specifications and details are not lost or misunderstood, has proved practical and profitable.

Most of the equipment manufacturers also provide mailable discs of wire or tape so that dictation may be made in the automobile or in the field wherever there is electric current available.

Bookkeeping Machines and Equipment

Adding machines, calculators, printing calculators, and other bookkeeping machines are designed not only to save time but to increase accuracy. This is of special importance to builders, because in figuring estimates and keeping track of expenses, lack of accuracy can easily cause an operation to show a serious cola beverages. There are, however, many different manufacturers of stencil-type duplicators, most of whom put out models operated both by hand and by electricity. Efficient reproduction of copies with these machines requires clean typewriter keys, an even "touch" in preparing the stencil, and a clean and well-oiled machine with ink pad in good condition for proper distribution of ink.

Spirit duplicators operate by typing a master on a sheet of smooth paper using special carbon paper. The master is inserted in the machine much as a stencil in stencil duplicating, and an alcohol base fluid moistens the master as each sheet passes over it and picks up enough of the carbon to make one impression. These machines are made in both hand and electric-operated models.

Offset equipment is primarily useful to the larger business where longer runs of forms and other papers are required. It operates in many ways similar to spirit duplicators, but actually could be considered "production" printing equipment.

Typewriters

Over the years since the development of the early Oliver typewriters with separate keyboards for capitals and lower case letters, manufacturers have constantly improved their products until today several manufacturers offer electrically-operated machines which do almost everything for the operator but spell correctly. Standard models have a variety of special features including easy ribbon changes, removable platens for cleaning and dressing, automatic margin settings, decimal tabulation for billing and accounting work, touch controls, and similar devices.

NEW FILE for plans and drawings has equal capacity to 30 regular drawers in horizontal cabinets, holds up to 5,000 sheets flat in folders by means of spring tension. Folding shelf makes notations easy, and visible index in lid makes finding simple
loss instead of a reasonable profit.

Estimating quantities of lumber and brick, extending invoices, figuring percentages, calculating costs, analyzing sales, computing payroll and social security, preparing financial statements, prorating expenses, discounting, pricing, and other general accounting operations are facilitated with one or more of these machines.

Direct Mail Equipment

Direct mail advertising—the use of letters, postcards, and various special mailing pieces—is salesmanship in print. It multiplies your sales efforts, and by properly qualifying inquiries and prospects, it can save you hours of time for real prospects instead of idle "suspects."

Thousands of builders have learned by experience that the consistent use of direct mail to keep in contact with old customers who recommend them to friends, and to keep their name before others in the community, will bring in new business and new customers as well as increase remodeling and modernization work.

The labor in folding mailing pieces, addressing, sealing and stamping will frequently run as high as 2¢ per piece for hand operations. Unless there are several thousand pieces being mailed on a list which is used repeatedly to gain the impact of repetitive advertising, the average builder cannot afford an expensive addressing machine or production-type folding equipment; he sends the work to the nearest letter shop. However, there are available a number of economical addressing machines operating on the spirit duplicator principle, in which the list is typed with special carbon on a roll. The roll containing addresses feeds through the machine as postcards or envelopes are inserted by hand, and makes possible addressing 1,000 or so pieces an hour.

Similarly, there are several low-cost folding machines available for small-office use, which will handle sheets of paper from 2½ by 3½ inches to 9 by 14 inches, and perform single folds, parallel letter folds, double parallel folds, accordion or statement folds, French folds, and horizontal with two vertical folds.

Postage meters now are used on over half the outgoing mail in the country, according to manufacturer Room 2008, 315 Fourth Avenue, New York 10, N. Y.

Accurate estimating is the initial step toward a profitable operation. And profitable estimating can only be based on fast, dependable figure work.

The Remington Rand Printing Calculator gives you this vital speed and accuracy. In one machine, you get short-cut multiplication and automatic division combined with lightning-fast addition and subtraction—plus "first-time proof" of accuracy, printed on the tape.

Payrolls, Invoice checking—all your other figuring problems, are handled faster, easier and at a lower cost. Send today for complete details on the Remington Rand Printing Calculator—see how it will save for you!
White Universal Level-Transit...

the most versatile instrument you can own!

Yes, the White "Universal" Level-Transit is the most practical, complete instrument on the market. Now available in a new improved model — the No. 3000 — with internal focusing, coated optics, guarded vertical arc. In fact, every feature to assure you lifetime durability and accuracy. And the price is only $185*, complete with tripod. See your dealer, or write David White Company, 311 W. Court Street, Milwaukee 12, Wisconsin.

Indispensable for all these jobs and many more

advertising message at the same time, and completely eliminate the stamp pilferage problem.

Miscellaneous

Contractors who wish to make deluxe proposals, binding their specifications and proposal in "book" form with drawings and other data securely bound, may do so with plastic binding equipment now available and suitable for use in the small office.

The common wax marking crayon has been developed still more by manufacturers. Builders may now obtain special crayons for marking lumber that are unaffected by climatic conditions; for marking wet or green lumber, metals both hot and cold, glass, rubber and asphalt tile.

Time Savers

The electronic secretary and automobile telephone are time and work savers for a number of builders. The electronic secretary consists of a small phonograph containing an answering record and a standard wire recorder which can record an hour of talk. When the phone rings, the phonograph record requests the caller to leave a message. The wire recorder cuts in and takes down the information inductively. Letters and instructions can be given the recorder over the phone for transcription at a later time. This device is of particular interest to the small office, operating perhaps with only part-time secretarial help.

An important point to bear in mind about most types of office equipment is that while they are useful in any large office, they are particularly useful to the small operator.

The small builder multiplies manpower at his disposal through the use of machines, machines which require no withholding tax, no wages, no social security payments, but only a little oil and reasonable care to give years of profitable operation.
This builder uses what he calls an X-Ray house which has sides, sheathing, and other portions cut away to show details of construction, plumbing, heating and wiring installation, and other features. Customers like to know what they are buying and appreciate this type of demonstration.

Contractors and builders who are "merchandising-minded" will retain that attitude even under present restrictions of starts possible for 1952 and curtailments of various types of materials and supplies normally used in former years. With rising costs and rising prices, potential buyers are becoming more choosy, and the builder who is geared to aggressive and effective sales effort will get his share of the business first.

Good Demonstration Pays

Many contractors have geared their selling effort to an effective demonstration, either utilizing a demonstration home after completion, a demonstration of a house under construction, or a cutaway model either on their own premises or on the site where other construction is taking place. When a buyer is putting ten or fifteen thousand dollars or more into a property, he must have confidence in the builder, and this confidence is greatly enhanced with the type of demonstration which explains carefully why certain materials are used, how the features of the building are constructed, and to some extent why new materials are preferred to others.

Quality the Best Salesman

How to sell homes, in the final analysis boils down to a phrase familiar to all builders—simply build a better home and then let the public know about it. How to achieve more quality is a question that can be answered in hard work and close supervision of every phase of the job, in constantly improved design, in keeping in touch with developments in machines, materials and techniques, and in consistent alertness to meet changing tastes and living needs.

Extras Add Sales Appeal

Some builders give extra sales appeal to their homes by lavish use of "extras." Variations from standard designs with different room arrangements are supplemented by installation of electrically operated picture windows, revolving closets in master bedrooms, hamper-utility cabinets in bathroom halls, floor-to-ceiling bookcases, storage or cabinet wall installations, prefabricated chimney or fireplace units, copper plumbing, automatic garage door openers, and plenty of closet and storage space.

Appliances Are Great Sales Aid

Women want labor-saving appliances, and most realize that if they

National Home Week in September, 1952, will offer dealers and builders a cooperative opportunity to display materials and equipment as well as building skills in their salesrooms and in open-house demonstrations.
**DO THESE CONSISTENTLY**

1. Use Newspaper Display
   1. When your operation is large enough to justify the budget.
   2. Use white space generously.
   3. Get a provocative headline.
   4. Adapt an attractive format and signature to develop familiarity with repeated use.
   5. Use a map or clear instructions for reaching the property to view it.
   6. Be consistent, stay with it, repetition pays.

2. Use Newspaper Classified
   1. Write copy the way you talk. Be brief.
   2. Tell your story from the buyer’s viewpoint.
   3. Use brand names of equipment installed and sold as part of the package.
   4. Use several smaller ads scattered through.
   5. Sell value, not bricks and mortar. Use the basic emotional appeals.
   6. Use services provided by your local paper. They can help you write good ads, check results.

3. Try Direct Mail
   1. Use color in letterhead, sign in same color ink.
   2. In copy, capitalize on special features such as location, kitchen, landscape, etc.
   3. Provide for follow-up. Repeated mailings to the same list pull many times the results of single mailings. The time to buy is NOW, but NOW is different for different people.
   4. For emphasis add a handwritten note to typed or printed letters.
   5. Build your list constantly. More new names make more possibilities.

4. Try Radio
   1. Try for spot announcement during sports programs — considered the best time.
   2. Ask for action. Ask people to come and look!
   3. Try tie-ins with manufacturer’s promotions when you have packaged kitchens etc.

5. Signs and Souvenirs
   1. Keep signs freshly painted, neat, easily read. Use FOR SALE, and hang on SOLD strip later.
   2. Match booklet and advertising pencils make convenient gifts for prospects and visitors.
   3. Use some imagination to work out a unique device that fits your own operation particularly.

**AVOID THESE**

1. Using display space for “prestige” reasons. Classified frequently does as well or better.
2. Don’t clutter the ad with too much small print.
3. Avoid vague generalities, overworked words like “beautiful,” “bargain.”
4. Don’t try to “tell it all” by crowding.
5. Don’t duck the house’s faults. Anything you conceal will come out against you later.
6. Don’t fail to mention price in the ad. 50% of adv. readers pass up ads with no price.

1. Don’t over-abbreviate. The line you save may waste the lines you run.
2. Don’t splurge on Sunday and forget weekdays.
3. Don’t rush it. Take time to write a good advertisement, or don’t run any.
4. Don’t say anything you can’t prove. Try to build reader confidence always.
5. Avoid negative approaches, “scare” advertising.
6. Don’t write it off the cuff. Go look at the place as a buyer would. Then write the ad.

1. Don’t misspell the man’s name! Personalized letters with the name wrong are worse than broadsides with no name.
2. Don’t mail to “just anybody.” Check the list and qualify names as possible buyers first!
3. Don’t make it hard for them to reply. Provide reply card, prominent phone number, etc.
4. Don’t overlook your envelope. Make it sell for you with copy on back flap or side.
5. Don’t let your list get out-dated. Keep addresses current, and don’t forget to keep names of your established customers on the active list. They have friends!

1. Duck the time and program which has too many other programs competing for your listeners.
2. Keep it simple. A long, involved story loses listeners and makes no sales.
3. Don’t try it without a plan, a carefully prepared script, and follow-up ready to go.

1. Avoid too large and unsightly signs which stamp you as an obnoxious money-grubber.
2. If you have an expensive gift advertising pieces or premiums, qualify the prospect to avoid wasting too much material.
3. Don’t work without a PLAN. Will you get the money back in goodwill and eventual sales?
don't buy them with the house, they may have to wait a long time to get them at all. Where it is possible to buy the appliances right with the house with no increase in down payment and only a slight increase in the monthly installment, the inducement becomes very strong indeed.

Color Helps Sell Homes

Color styling of homes should be undertaken with the same care that is given to design, site planning, landscaping, production, and financing. Integrated color planning, whether for single unit or large developments, adds sales appeal to replace what is frequently monotony in color and lack of individuality in homes. In planning the exterior color scheme, avoid monotony, use colors which combine harmoniously with adjacent structures.

How Builders Sell Homes

Leaders in building and selling homes from all parts of the country have offered their field-tested sales practices to American Builder for the benefit of our readers. Ideas and opinions presented here have all been obtained by direct correspondence with builders, and are quoted from their replies.

1) Consider special features

Such items as double sinks in the kitchen, tile shower stalls in bathrooms, are a great help in making sales. In the higher priced brackets, get away from old basic plan ideas.

2) Fully furnish demonstrator

Where a builder has a number of homes under construction, the furnishing of one home is a great help in making sales. Have lawns in and yards fully landscaped. This gives the buyer a better chance to visualize what his own home will be like.

3) Use good design

Use plans that present simple, pure architectural designs. Get your attractiveness from proportion, line, location and type of windows. Use no fake dormers or gingerbread. Interiors should be so pleasing that you would be glad to live there.

4) Keep competitive price-wise

Keep your sales prices competitive at all times by maintaining a sufficient volume of construction to keep unit overhead at a minimum. Organize your sales force and handle your own sales. Make a name for yourself instead of for the broker.

5) Prove quality

Prove to the buyer that you are selling quality. Show him that you want him to live in happiness after he buys his home. Cut all fringe operating costs so you can give him more for his money.

<table>
<thead>
<tr>
<th>RATE YOUR PUBLICITY PROGRAM</th>
</tr>
</thead>
<tbody>
<tr>
<td>How many of these efforts have you made?</td>
</tr>
</tbody>
</table>

1. WHAT'S YOUR STORY? Have you covered these: MADE MISSED

A. Article on new site purchase .................................. B. Reports on progress in plans for new building
C. Construction starting date released .......................... D. Letting of subcontracts announced .........................
E. Ground-breaking ceremonies .................................. F. Naming of new tracts ...........................................
G. Completion schedule, homes started each day etc. ......... H. First street in, completion of first street etc. ............
I. Appointment of sales manager, agent etc .................... J. Announcement of terms of purchase ..........................

2. HOW ARE YOU SAYING IT?

A. Do you use a news story peg? ......................... B. Do you avoid duplication in several papers?
C. Do you provide plenty of good pictures? ......... D. Do you KNOW what sort of story your paper likes?

3. WHAT MEDIA OR APPROACHES ARE YOU USING?

A. Local newspapers, daily and/or weekly .............. B. Local radio stations with educational program
C. Local radio stations with news program .............. D. Community organizations, their bulletins etc.
E. Speeches to organizations, church groups etc.

4. PLANNING YOUR PROGRAM:

A. Do you have an over-all PLAN for publicity? .... B. Is publicity integrated with advertising? ....
C. Have you provided check on pulling power? .... D. Have you provided follow-up methods? ....
E. Do you stay with it consistently, every week? ........

5. Try giving the buyer a complete service and check-up on his home after 30 days, FREE. Offer free adjustment on appliances by experts. Tell about free mail delivery and no city taxes on homes being built. Mention free parking, free playground for the children, etc.

6. Have something FREE

Try contacting a local progressive furniture store and getting them to furnish your demonstration or model home. Contact, also, suppliers of products that go into the home building, and between them and the furniture company’s suppliers you can operate some large space cooperative advertising that will really get results.

7. Furniture store tie-in

We have a five-minute morning radio program which features a young lady who personalizes the ‘home buy’ of the day, offering description, location, decorative details, cost, down payment, and monthly payment. We have been most successful in attracting new clients who have come to us after hearing the radio show.

8. Salesman should be “sold”

It is most essential that the salesman, himself, should be sold on what he is selling. He should be well versed in its many advantages and features, and confident of his claims in talking about such things as the heating system, weight and durability of castings, capacity of the furnace in B.T.U.’s, plus the fact that it is properly installed; the savings realized because of proper insulation, the weather resistance of the type of roofing used, the compact and convenient arrangement of rooms.

9. Appliance dealers cooperate

Furnace dealers, appliance dealers, and representatives of stores handling linoleum and tile, for example, are always willing to cooperate in a program involving an open house opening of a development, and we have found it profitable not only in...
making immediate sales but also in building up the prestige of our company.  

(11) Furnish demonstrator with used furniture

We had our decorating staff furnish one of our model homes in second hand furniture for less than $1,000. It turned out to be amazingly attractive and we advertised it in the local papers and circularized pamphlets.

(12) Community playhouse

A community playhouse is the greatest sales idea we have used. It can be used with a project of 300 houses or more, and consists of building a club house, swimming pool, baseball diamond, wading pool for youngsters, barbecue, etc., for the exclusive use of the home purchasers. Prorating the cost among all the houses, it amounts to not over $1.00 per unit.

(13) Sell saving and satisfaction

I tell purchasers that buying a home gives them and their family security and happiness and a good estate to leave at their death. I ask them why they rent when they can buy at a monthly payment no larger than the rent they are paying. I also tell them they save their earnings and put them in a bank which loans it to other people who are buying homes with no cost to themselves.

(14) Use newspaper display

The most successful selling method is newspaper display advertising which displays an illustration of the house with floor plan, with full details as to price, down payment, FHA commitment, etc. Successful selling, however, really starts at the beginning with good site selection, neighborhood, honest quality construction.

(15) Watch the market

One fundamental which goes a long way towards success in this business is judging the market. Although the market for low-priced homes is saturated nationally, it may not be in your location, and vice versa. Only by watching the market and filling real needs can homes be sold successfully.

(16) Follow the model!

When you set up a model house in a development or subdivision, have it fully decorated, and then adhere to its specifications and use the same fixtures and features in the rest of the subdivision so as to avoid any misunderstanding with buyers.

(17) Be specific in advertising

Don't be misleading in advertising, either accidentally or on purpose. Items listed in good advertising should include footage of house; brick or frame; basement or basementless; with or without garage; number of rooms; down payment; monthly payment and complete loan costs. This eliminates many unqualified buyers and illusion among people who misunderstand things otherwise.

(18) Personalize the pitch

Meeting personally as many prospective buyers on the subdivision as possible and spending enough time with each to create a feeling of your sincere interest in his housing needs is effective and necessary in modern home selling. By far the best help comes from sending a qualified and definitely interested prospect to a previous customer for verification and confirmation of your claims.

(19) Get everyone into the act

We have had great success by training our regular plumbers, carpenters, masons, and other tradesmen to meet prospective customers who appear on the site and tell them how the construction is being done, explain the quality that is being built into each house. Thus we get the prospects talking with one another and feeling friendly, and we have salesmen at their elbows all the time without their feeling any pressure from a "sales force."

(20) Cater to the children

Catering to children can be both enjoyable and profitable for members of a building firm. Prospective home buyers are impressed, and the youngsters get a great deal of fun out of simple presents of candy or inexpensive toys. We have a minimum of malicious mischief on our jobs.

(21) Signs are important

We believe that good signs are most important. Consequently, we spend a considerable amount building attractive ones. It is also important for signs to be repainted and refreshed up frequently.

(22) Personal follow-up helps

Another good feature to use is the sending of flowers, bulbs or a bush to each buyer for a Christmas present. Also, whenever a baby is born, sending flowers to the mother at the hospital is welcomed and remembered. From all this we get many letters and testimonials which are compiled in a very useful scrapbook.

(23) Handling complaints

One of the most important things we have developed is a complaint follow-up system. When a complaint is made, one copy is sent to the craftsman in the field, another kept in the office. When the craftsman takes care of the complaint, or has a reason for not doing so, he writes it on his slip and returns it, and this is then put in the file. We have found that present and past customers are our best salesmen (over 50 per cent of our sales in the last 20 years).

(24) Handle homes individually

One thing that aids selling homes is handling each house individually. We do not use a model house or show any home before it is completed. This includes all decorating, grading, lawn, sidewalks, etc. We then hold open house for this particular property by using newspaper display ads containing a picture of the house and talk only about this one house to all prospects. By this method we sold all of this year's production, except two, the first day they were offered.

(25) Use personal contact system

As we receive inquiries regarding homes, we get as much information as possible regarding the type of home wanted, which we follow up later as homes are available if we do not have something currently which would look interesting. People appreciate the personal touch of the builder who really tries to fit their specific family needs.

National Home Week

National Home Week plans by builders all over the country call for a more extensive observance of the event than in any prior year. Inaugurated by American Builder in 1948, and spearheaded by the National Association of Home Builders and its local chapters, in 1950 the NAHB was joined by the National Retail Lumber Dealers Association in sponsoring observance of the annual demonstration and merchandising promotion.

The open house technique has proved to be successful, even in smaller communities where the builder does not always have a house to show. Builders and dealers have a beautiful opportunity to team up for cooperative demonstrations of homes, materials, and equipment. The basis for successful promotion is an educational theme designed to give prospective home buyers and those considering remodeling an insight into all the materials, equipment, and skilled labor that are involved in completing the home-building job.

Builders and dealers will find the 1952 National Home Week an excellent opportunity to stimulate sales, and they will probably need, at that time if present trends continue. It will also give them an opportunity to show the public that the home building and modernization industry has not been stymied by the loss of a few critical materials but will continue to satisfy customers' needs.
# Check These CUSTOMER CONTACT POINTS

<table>
<thead>
<tr>
<th>1. SIGNS, BILLBOARDS ETC.</th>
<th>INADEQUATE</th>
<th>FAIR</th>
<th>GOOD</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Deface landscape. Definitely in the nuisance class. Loud, glaring.</td>
<td>Render extra service such as safety, mileage. Talk policies, service.</td>
<td>Suggest firm stability. Tell specific benefits customers receive from us.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>2. DEMONSTRATION OR MODEL HOME FOR INSPECTION</th>
<th>INADEQUATE</th>
<th>FAIR</th>
<th>GOOD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Incomplete, cluttered, shows signs of haste or carelessness.</td>
<td>Well finished, cleaned up for inspection, may have kitchen furnished.</td>
<td>Finished, landscaped, fully furnished with furniture all rooms.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>3. OFFICE OR SHOWROOM BUILDING, EXTERIOR</th>
<th>INADEQUATE</th>
<th>FAIR</th>
<th>GOOD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Needs paint, cleaning, tuck-pointing, repairs, looks like a &quot;dump.&quot;</td>
<td>Clean, in good general repair, but not at all outstanding.</td>
<td>Distinctive, attractive, suggests prosperity, modern design etc.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>4. OFFICE OR SHOWROOM BUILDING, INTERIOR</th>
<th>INADEQUATE</th>
<th>FAIR</th>
<th>GOOD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dirty, lighting bad, ventilation poor, hot in summer, cold in winter.</td>
<td>Well heated, moderate lighting, clean, generally orderly appearance.</td>
<td>Clean, bright colors in decorative scheme. Air conditioned summer &amp; winter.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>5. APPROACHES: DRIVEWAYS, SIDEWALKS</th>
<th>INADEQUATE</th>
<th>FAIR</th>
<th>GOOD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Littered with trash, broken, holes, icy in winter, narrow.</td>
<td>Unencumbered, clean, in good repair, of proper width for traffic.</td>
<td>Ice-free in winter, well drained, good repair, wide. Fits into &quot;landscape.&quot;</td>
<td></td>
</tr>
</tbody>
</table>

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<thead>
<tr>
<th>6. ENTRANCES</th>
<th>INADEQUATE</th>
<th>FAIR</th>
<th>GOOD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Narrow, located in traffic-jam-prone spots. Badly lighted.</td>
<td>Easy of access. Good width. No congestion. Lights all around.</td>
<td>Well designed in harmony with rest of building. Lighting for display as well as protection.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>7. INTERIOR FIXTURES, DESKS, CASES ETC.</th>
<th>INADEQUATE</th>
<th>FAIR</th>
<th>GOOD</th>
</tr>
</thead>
</table>

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<thead>
<tr>
<th>8. FOLLOW-THROUGH</th>
<th>INADEQUATE</th>
<th>FAIR</th>
<th>GOOD</th>
</tr>
</thead>
<tbody>
<tr>
<td>No follow-thru with customers after sale is completed.</td>
<td>Routine check made to see if everything is satisfactory.</td>
<td>Repeated follow-up with information about house, appliances installed etc.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>9. CLERICAL PERSONNEL</th>
<th>INADEQUATE</th>
<th>FAIR</th>
<th>GOOD</th>
</tr>
</thead>
<tbody>
<tr>
<td>No smiles. Reluctant to give customer service. Insist on all red tape.</td>
<td>Prompt in serving customer. Courteous. Trained not to give offense.</td>
<td>Friendly, efficient, show they LIKE to give service. Prompt and pleasant.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>10. SALES PERSONNEL</th>
<th>INADEQUATE</th>
<th>FAIR</th>
<th>GOOD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ignorant of properties they sell, untrained in sales techniques.</td>
<td>Know their &quot;merchandise.&quot; Have some sales training but can stand more.</td>
<td>Know &quot;wares&quot; very well. Try to bring out features of customer value in houses etc.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>11. WORKMEN ON THE JOB</th>
<th>INADEQUATE</th>
<th>FAIR</th>
<th>GOOD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Do their work with no regard for customer's convenience or satisfaction with work done.</td>
<td>We try to keep up schedules to meet completion dates on time.</td>
<td>Workers have attitude: &quot;Build it as though I'm going to live in it myself.&quot;</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>12. PERSONNEL—OFF DUTY RELATIONSHIPS</th>
<th>INADEQUATE</th>
<th>FAIR</th>
<th>GOOD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Personnel ignore or deprecate the fact that they work for us in their off duty contacts.</td>
<td>Most employees seem proud to work here and admit it to their friends.</td>
<td>Most employees seem to promote goodwill actively for our organization in their own contacts.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>13. COMPLAINT OR ADJUSTMENT HANDLERS</th>
<th>INADEQUATE</th>
<th>FAIR</th>
<th>GOOD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Employees think customer is always wrong. Slow to service complaints. Would prefer to alibi.</td>
<td>Trained to handle complaints and adjustments promptly, courteously. The customer is right etc.</td>
<td>Careful, courteous treatment at all times. Make real effort to keep customer happy.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>14. TELEPHONE CONTACTS</th>
<th>INADEQUATE</th>
<th>FAIR</th>
<th>GOOD</th>
</tr>
</thead>
<tbody>
<tr>
<td>People careless in taking calls, handling messages. Don't get names, poor telephone voices etc.</td>
<td>Trained to get names right. Give pat answers to all of the most common questions etc.</td>
<td>Courteous, friendly, get names right. Cheerful voices. Have detailed instruction for handling most situations.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>15. THE BOSS, EXECUTIVES</th>
<th>INADEQUATE</th>
<th>FAIR</th>
<th>GOOD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Too busy being a &quot;boss&quot; to have much time for close customer contact.</td>
<td>Spends more time with customers than watching the rest of the business.</td>
<td>Has a fine happy medium. Keeps enough close customer contacts to have the feel of the thing.</td>
<td></td>
</tr>
</tbody>
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**How Do Your Customers Rate You?**
<table>
<thead>
<tr>
<th>Performance CHECK UP for Builders Salesmen</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Establishing personal sales quotas:</strong></td>
</tr>
<tr>
<td>1. Do you use daily and weekly personal sales quotas ... yes no</td>
</tr>
<tr>
<td>2. Do you make use of a large wall chart or other graphic record of your past sales and future objectives? yes no</td>
</tr>
<tr>
<td>3. Do you set yourself a definite quota of &quot;cold turkey&quot; or new-prospect calls for each day, week, month? yes no</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Ability as a teacher:</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Do you feel that you know your subject, product and service, well enough to teach a new salesman? yes no</td>
</tr>
<tr>
<td>2. When you are making a sales presentation, do you question the buyer carefully from time to time to be sure he understands? yes no</td>
</tr>
<tr>
<td>3. When you are &quot;educating&quot; a customer, do you start by finding out what her real problem is and then help her find a solution? yes no</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Ability to sell to groups or meetings:</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. If you were faced with the problem of making a sale to a group of strange people, could you guide the discussion to the decision you want? yes no</td>
</tr>
<tr>
<td>2. Before you enter a meeting at which you intend to present a proposal, how do you find yourself feeling—confident and alert? yes no</td>
</tr>
<tr>
<td>3. When the group sets up a cross-fire of questions and arguments between the members, can you control the talk so that it stays on the track and reaches the decision you want? yes no</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Managing your selling time:</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Do you spend a few minutes each evening deciding where your time will be spent the next day? yes no</td>
</tr>
<tr>
<td>2. Have you ever stopped to analyze how you spend your time by listing for each day for a week what you did, where and when? yes no</td>
</tr>
<tr>
<td>3. Have you ever stopped to figure out in dollars and cents what it costs you to make a single sales presentation? yes no</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Managing your business:</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Do you maintain an up-to-the-minute file so you have all essential information about properties ready &quot;on tap&quot;? yes no</td>
</tr>
<tr>
<td>2. Do you have your travel organized so that you have eliminated back-tracking and unnecessary running around? yes no</td>
</tr>
<tr>
<td>3. Have you developed complete and accurate records, showing prospects, old customers, past business, needs of each, etc.? yes no</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>The ability to think as you talk:</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. When you are meeting a new prospect for the first time, do you remain confident, say what you want to say easily and freely? yes no</td>
</tr>
<tr>
<td>2. Do you have your ideas organized in your mind for making a presentation? Are you so well prepared that you can't get &quot;rattled&quot;? yes no</td>
</tr>
<tr>
<td>3. Are you able to converse easily with customers, answering questions, handling objections, and at the same time fitting their ideas into your presentation as you lead them toward the &quot;close&quot;? yes no</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Ability to use words that sell:</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. The right TONE of voice is often as important as the words. Do you shun monotony and dulness by effective inflections and modulation of your voice? yes no</td>
</tr>
<tr>
<td>2. The telephone company says: &quot;The voice with a smile wins!&quot; Is your voice a friendly voice or merely to make up the air? yes no</td>
</tr>
<tr>
<td>3. WORDPOWER is one of the greatest skills of all salesmen. Are you doing something each day to build up a more effective sales vocabulary? yes no</td>
</tr>
</tbody>
</table>

There is no passing score on this "quiz" but any item you cannot answer "yes" may be causing you to lose profitable business.

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*Are you selling or just telling?*
DESIGN HINTS AND ESTIMATING SHORT CUTS

How Some Builders Create Character in Communities

The home builder, like the doctor and lawyer, has a large responsibility to society. While he is providing for the physical comfort of his customers today, he must also be looking ahead to the contribution his work is making to the community as a whole.

In the mad scramble to produce houses between 1946-1951, a fair number of unfortunate economies and practices crept in, especially in developments involving a number of houses erected and “planned” together. There was in some cases a tendency to utilize the cheapest land available almost without regard to its actual fitness for housing, and to confine land improvements to a minimum.

The practice of stripping land of trees and grading to plane surface in order to save a few dollars, and the frequent use of traditional “grid” layout of streets and alleys, have created many communities which are not only unattractive but actually wasteful of land.

Slums of Tomorrow?

Monotony has been intensified through repetitive structural orientations in large project planning; and variation through minor changes in fenestration in many cases has only served to emphasize the basic sameness of the structures. In some instances we have seen faulty structural designs result from attempts to adapt stock plans to the stringent reductions made necessary under government regulations. Along with this inadequately site preparation has omitted necessary retaining walls and storm drainage facilities, thus creating serious erosion problems in surrounding land. Such housing projects may well be the slums of twenty years hence.

However, good community planning has been demonstrated in many developments. Since construction costs prohibit the introduction of architectural variety into house design in large-scale developments, the developer and builder must resort to other methods of creating variety.

How to Upgrade Community Planning

Techniques which builders have used to improve the character of moderate and low-cost residential developments include:

1. The employment of curvilinear street layouts to introduce variety and interest and improve structural orientations in relation to light, air, sunshine, privacy and landscape requirements.

2. Conservation and skillful use of natural resources such as interesting topography, trees, and scenic vistas.

3. Keeping any “stock house” unobtrusive by blending it with the landscape through appropriate design, use of subdued colors, and skillful siting and planting plans.

4. Breaking up long, monotonous vistas with curves, slopes, trees.

5. Creating dominant points of interest at the ends of streets or at street junctures to divert attention from the repetitive stock house.

6. Skillful mingling of house types to insure variety and a more efficient use of land.

None of these recommended techniques is expensive when employed by a builder with a thorough knowledge of planning and a genuine desire to create livable housing. The builder’s responsibility for long-range community planning can only be met by such constructive planning.

Homes Families Want

Most families want to build a house that looks somewhat like the home they remember, but without the inconveniences or fussy ornamentation of that home. They want simplicity and highly functional efficiency in their home, lower cost and easier upkeep.

The typical house built after World War II was a one-story two- or three-bedroom house with one bath and limited equipment, and costing between $10,000 and $13,000. An estimated 20 per cent of postwar homes
Number of entrances and their location must be studied with relation to street traffic and traffic flow within the store. Exterior windows, except for display, are being omitted in much modern store construction, with consequent gains in ease of controlled interior lighting and air conditioning. Provision for future expansion of the building may be made with the original plans.

**Store Fronts**

Store fronts may represent from as little as 10 per cent to as high as 50 per cent of the cost of modernization of an existing structure, and may run around 25 per cent of the cost of new building in the case of a small store. Factors to be studied in planning the store front include considering whether the materials chosen reflect the character of the store itself, maintenance and permanence, sufficient depth for facade and entrance, simplicity, and whether the front suggests the quality of merchandise to be found inside.

Materials most commonly used in modern store fronts include marble, granite, terra cotta, precast terrazzo, structural or architectural glass, ornamental metal, stone, ceramic tile, porcelain enameled metal, luminous materials such as opal glass, wood, cement stucco and various synthetic materials such as laminated plastics and phenolics.

**Estimating and Customer Relations**

The problem of estimating, involving as it does changes in plan and final costs, is one which often plagues the relationship between builder and client. Mrs. X wants an extra closet. Her husband decides he would like a built-in bar in one corner. But when the bills come in, the builder gets nothing but complaints and abuse. The simplest way to duck all this trouble is to go over the original plans and specifications thoroughly with the client, and then use a written form whenever additional changes are requested, working out at that time the cost of these changes and making the client sign the authorization so that he has no complaint when the added bills arrive. Such a form can be printed in pad form, pocket-size, and can be used on the site when changes are requested. As a means of insuring harmonious customer relations, it works wonders.
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We would like to get your reaction to this CATALOG DIRECTORY. Do you like it? May we have your ideas for improving it? Please fill in the other side of this card. We will appreciate it very much.
This, the second issue of the annual directory compiled by the American Builder, gives the latest and most complete product and data information in the building field. Here contractors, builders, architects, and building material retailers will find information as to building products, their manufacturers, and brand names.

New this year are two sections, Industry Associations, and Communities which observed National Home Week in 1951.

1. An alphabetical list of building products and equipment and their manufacturers;
2. An alphabetical list of brand names identified with names of manufacturers;
3. An alphabetical list of manufacturers of building products and equipment with addresses;
4. An alphabetical list of industry and allied professional associations;
5. An alphabetical list of communities which participated in 1951 National Home Week.

In addition, service organizations prepared to render aid to the industry and to furnish helpful information on special problems are listed under appropriate titles.

This year round reference directory designed to serve the builder, contractor, architect, and dealer. As every effort was made to make it as accurate as possible, the American Builder cannot be responsible for changes in names, addresses, and other discrepancies.

The names of manufacturers who advertise in American Builder are printed in boldface here, in the brand names list and in the list of manufacturers’ names and addresses starting on page D-76.

SECTION I
Alphabetical List of Building Products and Equipment Manufacturers

In this Section I, building products and equipment are listed in alphabetical order with the manufacturers of these products and equipment listed under the appropriate titles. No cross references have been used in this section. The editors feel that the readers of the American Builder are well acquainted with the terms employed in the building industry and can lead themselves to the items in this directory. The principal proper nouns of classifications are the key words used in forming the alphabetical lists; for example, wood double hung windows are listed as—

Windows, double hung, wood
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<th>Category</th>
<th>Companies</th>
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<td>Brox Cartier Co</td>
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<td>Woodstock Industries Inc</td>
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<table>
<thead>
<tr>
<th>SAFES</th>
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<tr>
<td>Biddle Inc</td>
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<tr>
<td>General Pemongling Co</td>
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<tr>
<td>Heister (Charles) Mfg Co</td>
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<tr>
<td>McQueary Register Co</td>
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<tr>
<td>Meier Safe Co</td>
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<tr>
<td>York Safe &amp; Lock Co</td>
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<tr>
<th>SAFES, BUILT-IN WALL</th>
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<tr>
<td>Dickey Inc</td>
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<tr>
<td>Dudley Locke Corp</td>
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<td>Gabriel Steel Co</td>
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<tr>
<td>Meier Safe Co</td>
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<td>Meier Safe Co</td>
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<td>REMINGTON RAND INC</td>
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<tr>
<th>SALAMANDERS</th>
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<tr>
<td>Aerial Products Co</td>
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<tr>
<td>American Steel Works</td>
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<tr>
<td>Danielles &amp; Co Inc</td>
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<td>Durr (George W) Mfg Co</td>
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<td>Durr (George W) Mfg Co</td>
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<td>Shick</td>
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<tr>
<td>Johnson (J W) Mfg Co</td>
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<td>Mason &amp; Safe Mfg Co</td>
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<td>Shick Mfg Co</td>
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<tr>
<td>Smith &amp; Safe Mfg Co</td>
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<tr>
<td>Talon Mfg Co</td>
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<tr>
<td>Sand, Silica White</td>
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<tr>
<td>Central Silica Co</td>
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<tr>
<td>Tamco Industries Inc</td>
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<tr>
<th>SANDERS, BELT, DRUM, SPINDLE &amp; DISC</th>
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<tr>
<td>Reiss Mfg Co</td>
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<td>Black &amp; Decker Mfg Co</td>
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<td>BRICE-CRAKE CO</td>
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<tr>
<td>Curtis Machine Co</td>
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<tr>
<td>Eaton, Mfg Co</td>
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<tr>
<td>Gold Metal Co</td>
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<tr>
<td>HAMMOND PNEUMATIC TOOL CO</td>
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<tr>
<td>HAMMOND-PNEUMATIC TOOL CO</td>
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<tr>
<td>Meier Safe Co</td>
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<tr>
<td>MINNEAPOLIS ELECTRIC TOOL CORP</td>
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<tr>
<td>Minneapolis Machine &amp; Tool Co</td>
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<tr>
<td>National Air Sander Co</td>
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<tr>
<td>Oliver Machinery Co</td>
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<tr>
<td>PORTABLE-CABLE MACHINE CO</td>
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<tr>
<td>Builders Wagon Co</td>
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</tbody>
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Manufacturers’ Names and Addresses Start on Page D-76
Manufacturers’ Brand Name Identifications Start on Page D-64
Manufacturers' Names and Addresses Start on Page D-76
Manufacturers' Brand Name Identifications Start on Page D-64
BRAND NAMES used to identify principal building products and equipment of major manufacturers are listed in this section in alphabetical order with the names of manufacturers using the brand names. Trade and brand names popularly used in the building industry are listed irrespective of their registration. This selective list is presented for the convenience of builders, contractors, architects and retail material dealers who will find it helpful in identifying the manufacturers of certain building products and equipment.

The names of the manufacturers are listed after the brand or trade name. The complete addresses of the manufacturers will be found in Section III beginning on page D-76.
<table>
<thead>
<tr>
<th>Company Name</th>
<th>Address</th>
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</thead>
<tbody>
<tr>
<td>CE-INC.</td>
<td>123 Street, City, State</td>
</tr>
<tr>
<td>DCF-TRAM</td>
<td>456 Avenue, Country, Region</td>
</tr>
</tbody>
</table>

List of Manufacturers’ Names With Complete Addresses Starts on Page D-76
Principal manufacturers of building products and equipment are listed in this section in alphabetical order. In some instances, the manufacturing organization is listed under the name of a division rather than under the parent company; popular usage served as a guide in these cases. For example, the manufacturer of Chevrolet Trucks is listed as -

Chevrolet Motors Div., General Motors Corp., rather than -

General Motors Corp., Chevrolet Motor Div.

The Names of Manufacturers Who Advertise in American Builder Appear in Boldface

In other cases such as those involving departments of companies, the more popular major name is used as the key to the index. For example, the garage hardware department of the Stanley Works is indexed as follows -

Stanley Works, Garage Hardware Dept.

Care has been taken to make this index as accurate as possible, but the American Builder is not responsible for changes in addresses and other discrepancies.

The American Builder directory includes a listing of manufacturers and addresses for various products and equipment. The directory is organized alphabetically and includes a list of manufacturers who advertise in the magazine. The names of manufacturers who advertise appear in boldface. The directory also notes that the index is not responsible for changes in addresses and other discrepancies.
American Builder
INDUSTRY AND ALLIED PROFESSIONAL TRADE ASSOCIATIONS

Associated Equipment Distributors, Inc., 360 N. Michigan Ave., Chicago 1, Illinois. P. D. Herman, Secretary.
Atlantic Millwork Institute, Inc., 122 E. 42nd St., New York City 14, New York. C. H. Melander, Secretary.
Barn Equipment Association, 530 S. Wells St., Chicago 6, Illinois. W. Floyd Keepers, Executive Secretary.
Building Products Institute, 1520 16th St., Washington, D. C. Building Research Advisory Board (National Research Council, National Academy of Sciences), 2101 Constitution Ave., Washington 25, D. C.
CALIFORNIA REDWOOD ASSOCIATION, 576 Sacramento St., San Francisco 11, California. Philip Farnsworth, Manager; Kenneth Smith, President.
CANVAS AWNING INSTITUTE, INC., 2397 W. 25th St., Cleveland, Ohio. Walter C. Astrup, President.
Cast Stone Institute, 2135 Queen's Chapel Rd., N. E., Washington, D. C. C. G. Walker, Managing Director.
Cement Institute, 111 West Washington St., Chicago 2, Illinois. A. E. Hjerpe, Secretary.
Clay Products Association, 100 N. LaSalle St., Chicago 2, Illinois. John D. Cook, Secretary.
Clay Sewer Pipe Association, Inc., 1103 Huntington Bank Bldg., Columbus 15, Ohio.
Concrete Masonry Manufacturers' Association, 3256 W. Sixth St., Los Angeles 5, California. C. E. Hendrickson, Secretary-Manager.
Concrete Reinforcing Steel Institute, 38 S. Dearborn St., Chicago 3, Illinois.
Concrete Manufacturers' Association, c/o American Radiator & Standard Sanitary Corp., 40 W. 40th St., New York City, New York. F. E. O'Callahan, Secretary.
Conveyor Equipment Manufacturers' Association, 1129 Vermont Ave., Washington 5, D. C. R. R. Sollenberger, Executive Vice President.
Copper and Brass Research Association, 420 Lexington Ave., New York City 17, New York. T. E. Veifort, Manager.
Decorative Lighting Guild of America, c/o Foster & Davies, Kieth Bldg., Cleveland 15, Ohio. Don M. Julien, Secretary.
Edison Electric Institute, 420 Lexington Avenue, New York City 17, New York. C. W. Kellogg, President.
Electrical Industrial Truck Association, 3701-H N. Broad St., Philadelphia 40, Pennsylvania. Wm. Van C. Brandt, Managing Director.
Finishing Lime Association of Ohio, Home Bank Bldg., Toledo, Ohio. L. E. Johnson, Secretary.
local chapters of the national association of home builders

alabama

birmingham association of home builders, 315 comer bldg., birmingham, al. j. l. baswell, executive vice president.

tricities home builders association, shop plike, shiellf, alabama. hubert h. dudley, secretary-treasurer.

montgomery home builders association, p. o. box 1224, montgomery, al. g. c. dickey, secretary-treasurer.

arizona

phoenix association of home builders, bank of dallas bldg., phoenix, arizona. brinton burns, executive secretary.

arkansas

arkansas home builders, 218 pyramid bldg., little rock, arkansas. miss lorna pase, executive secretary.

california

peninsula general contractors & builders association, inc., 350 el camino real, cerritos, california. harry e. smith, executive vice president.

home builders association of fresno, 1837 merced st., fresno, california. noyes alexander, executive secretary.

home builders institute, suite 507 315 w. 9th st., los angeles, california. clifford hanson, executive vice president.

building contractors association of california, inc., 155 s. alvarado st., los angeles, california. edward d. day, executive vice president.

associated builders & contractors of the greater east bay, inc., 277 w. macarthur bldg., oakland, california. john i. heinmoss, executive vice president.

general contractors association of contra costa county, inc., 1731 mt. diablo bldg., p. o. box 343, walnut creek, california. frederic c. krieter, executive vice president.

associated home builders of sacramento, 137 tivoli way, sacramento, california. c. r. perkins, secretary-manager.

marin builders association, inc., room 26 chateau bldg., san rafael, california. thomas e. schaal, secretary.

associated home builders of san francisco, inc., 31 geary st., suite 200, san francisco, california. william e. gillis, executive vice president.

home builders association of san joaquin county, 1858 s. stockton st., stockton, california. bill phillips, president.

colorado

colorado springs home builders association, p. o. box 206, colorado springs, colorado. john bontioti, secretary-treasurer.

denver association of home builders, 931 sherman, denver, colorado. eugene r. miller, executive secretary.

connecticut


home builders association of hartford county, inc., 62 la salle road, w. hartford, connecticut. clayton w. johnson, executive secretary.

home builders association of greater new haven, 80 elm st., new haven, connecticut. william b. young, secretary.

delaware

home builders association of delaware, capitol trail, newark, delaware. francis e. mccormack, executive secretary.

district of columbia

home builders association of washington, suite 303, 1757 k st., n. w., washington, d. c. james w. pearson, executive director.

florida


home builders association of florida, 2245 south beach st., daytona beach, florida. w. w. Patrick, secretary.

home builders association of panama city, 217 w. church st., jack- sonville, florida. walter j. cowart, executive secretary.

contractors & builders association of peterburg, 3140 central ave., st. peterburg, florida. leslie d. williams, executive secretary.

home builders association of south florida, 220 miracle mile, coral gables, fl. george s. miller, secretary.

tallahassee home builders association, capitol hills, tallahassee, florida. horrie r. culpepper, president.

georgia

home builders association of atlanta, 312 volunteer bldg., atlanta, georgia. luther b. stephens, executive secretary.

home builders association of columbus, georgia. 1043 sixth ave., columbus, georgia. c. ed cooper, executive secretary.

home builders association of Savannah, 24 east bryan st., Savannah, georgia. j. d. melcomb, president.

idaho

idaho falls home builders association, corner of so. water & oak stx, idaho falls, idaho. earl anderson, president.

illinois

chicago metropolitan home builders association, 340 w. randall st., chicago 1, illinois. beverly l. cull, executive vice president.

home builders association of decatur, illinois. 1950 west forest, decatur, illinois. c. s. macdonald, secretary.

peoria area home builders association, 1905 prospect rd., peoria, illinois. a. c. hyde, secretary.

indiana

elkhart home builders association, 2825 south main st., elkhart, indiana. c. a. huffman, president.

evansville home builders association, inc., 610 court bldg., evans- ville 19, indiana. m. t. schick, executive secretary.

home builders association of fort wayne, 260 central bldg., fort wayne 2, indiana. c. m. Connor, executive secretary.

muncie home builders association, 300 cowing ave., muncie, indiana. george hinnor, secretary-treasurer.

sommer association of home builders, inc., 111 so. webster st., south bend, indiana. nw. weist, secretary.

iowa

home builders association of cedar rapids, 2461 1st ave., s. w., cedar rapids, iowa. r. t. powell, secretary.

home builders association of des moines, 6500 merle hayden ave., des moines, iowa. a. c. hallor, secretary.

quad city association of home builders, ron 225, fifth avenue bldg., moline, illinois. william shider, secretary-treasurer.

home builders association of sioux city, 33 w. 17th st., sioux city, iowa. myron schneider, secretary-treasurer.

kansas

topeka home builders association, national bank of topeka bldg., topeka, kansas. arnold w. johnson, president.

wichita association of home builders, 129 n. market st., wichita, kansas. frank malone, secretary-treasurer.

kentucky

home builders association of lexington, 875 e. high st., lexington, kentucky. j. w. davies, jr., secretary.

associated home builders of louisville, 614 east broadway, louis- ville 2, kentucky. w. arthur sorrell, executive secretary.

louisiana

home builders association of new orleans, inc., 427 carondelet st., new orleans 12, louisiana. genevieve w. rose, executive vice president.

home builders association of shreveport, suite b-2, 509 market st., shreveport, louisiana. larry robinson, executive vice president.

maryland

home builders association of maryland, 7 st. paul st., baltimore 2, maryland. philipp pitt, executive secretary.

american builder
MAINE
Home Builders Association of Maine, 234 A Middle St, Portland, Maine. Milan O. Welch, Executive Secretary.

MASSACHUSETTS
Home Builders Association of Greater Boston, 7 Water St, Boston 8, Massachusetts. Robert W. Heard, Manager-Director.
Franklin County Builders Assn, 301 Franklin St, Greenfield, Massachusetts. John F. Winseck, Secretary.
Home Builders Association of Worcester, 151 Main St, Worcester 8, Massachusetts. Robert H. Wood, Executive Secretary.

MICHIGAN
Battle Creek Association of Home Builders, 440 Hubbard Rd, Battle Creek, Michigan. Glenn Hanna, Secretary.
Builders Association of Metropolitan Detroit, 1401 Dixie Dr, Detroit 26, Michigan. John D. Boyle, Executive Vice President.
Flint Association of Home Builders, 429 S Dort Highway, Flint, Michigan. H. J. Rohn, Executive Secretary.
Home Builders Association of Kalamazoo, 609 So Burdick St, Kalamazoo, Michigan. E. McCammon, Executive Secretary.
Lansing Home Builders Association, 1125 S Pennsylvania Ave, Lansing 2, Michigan. E. P. Boynton, Executive Secretary.
Saginaw Valley Builders Association, 810 East Genesee St, Saginaw, Michigan. T. Nagle, Secretary.
Washtenaw County General Contractors, Inc, P. O. Box 368, Ann Arbor, Michigan. Wm. M. Brown, Secretary-Treasurer.

MINNESOTA
Minneapolis Home Builders Association, 1710 Hennepin Ave, Rm B 15, Minneapolis 3, Minnesota. Lawrence W. Nelson, Executive Secretary.
St. Paul Home Builders Association, 79 Western Ave, Commodore Hotel, St. Paul 2, Minnesota. A. L. Keffer, Executive Director.

MISSISSIPPI
North Delta Home Builders Association, Box 634, Clarksdale, Mississippi. R. Y. Spinks, Secretary.
Greenville Chapter of NAHB, Allen-Kee Lumber Co, Greenville, Mississippi. James McKeen, Secretary-Treasurer.

MISOURI
Home Builders Association of Greater Kansas City, 6638 J. C. Nichols Parkway, Kansas City, Missouri. James L. Hutton, Executive Secretary.
Home Builders Association of Greater St. Louis, 8843 Forsyth Blvd, Clayton 2, Missouri. Laurence E. Delmar, Executive Secretary.

NEBRASKA
Home Builders Association of Lincoln, 421 No. 9th St, Lincoln, Nebraska. W. F. Hoppe, Jr., Secretary.
Omaha Home Builders Association, 1805 Harney St, Omaha 2, Nebraska. A. R. Parks, Executive Secretary.

NEW HAMPSHIRE
 Builders Association of New Hampshire, 412 Blodgett St, Manchester, New Hampshire. Roland H. Breton, Secretary-Treasurer.

NEW JERSEY
HBA of Somerset & Morris Counties, Madisonville Rd, Basking Ridge, New Jersey. Frank Van Awdale, Secretary.
New Jersey Home Builders Association, 171 Main St, Hackensack, New Jersey. Clarence H. Von Drehle, Executive Secretary.
Atlantic Home Builders Association of New Jersey, 7717 Ventnor Ave, Margate City, New Jersey. Elroy Lott, Secretary.
Home Builders Association of Metropolitan New Jersey, Military Park Hotel, Suite 73A, 16 Park Place, Newark 11, New Jersey. William J. Gaynor, Executive Director.
Home Builders Association of Northern New Jersey, 171 Main St, Hackensack, New Jersey. Clarence J. Von Drehle, Executive Director.
New Jersey Shore Builders Association, P. O. Box B 5, Sea Girt, New Jersey. Arthur T. Turner, President.
Home Builders Association of Raritan Valley, P. O. Box 350, New Brunswick, New Jersey. Raymond H. Kohler, Secretary.
Home Builders League of South Jersey, 622 Cooper St, Camden 2, New Jersey. Harry Smith, Secretary.
Home Builders Association of Mercer County, 143 E State St, Trenton, New Jersey. A. M. Bernstein, Secretary.

NEW MEXICO
Albuquerque Home Builders Association, 1235 So. Yale St, Albuquerque, New Mexico. Louis Vanderkamp, Executive Secretary.

NEW YORK
Chenango Valley Home Builders Association, Lodi, 57 East Market St, Cortland, New York. Mason J. Bower, Executive Secretary.
Oneida County Builders Association, 152 Bank St, Rome, New York. R. G. Lockey, Acting Secretary.
Long Island Home Builders Association, 234 Fulton Ave, Hempstead, L. I., New York. O. J. Hartwig, Executive Secretary.
Niagara Falls Home Builders Association, 438 Niagara Falls Blvd, Niagara Falls, New York. Anthony F. Solzani, Executive Secretary.
The Better Builders Association of Oswego Co, Inc, 2673 South Salina St, Syracuse, New York. M. S. Ackerman, Executive Secretary.

OHIO
Home Builders Association of Greater Akron, 651 1st Central Tower Bldg, Akron 8, Ohio. A. J. Alexander, Secretary-Treasurer.
Elyria Home Builders Association, 134 Kenwood St, Elyria, Ohio. L. H. Pooty, Executive Secretary.
Home Builders Association of Stark County, Ohio, Inc, 243 Muskegon Ave, N. W. Cantor, Ohio. Robert Calmeta, Executive Secretary.
Home Builders Association of Greater Cincinnati, 607 Union Trust Bldg, Cincinnati 2, Ohio. Jack O. Schumaker, Executive Secretary.
Home Builders Association of Greater Cleveland, Alberton Hotel, E 126th & Chester Ave, Cleveland, Ohio. Jerry Madigan, Executive Director.
Columbus Home Builders Association, 16 E Broad St, Suite 1300, Columbus, Ohio. Miss Laura Janes, Executive Secretary.
Home Builders Association of Butler County, 375 Columbia Road, Hamilton, Ohio. John C. Hecks, Secretary.
Lorain Home Builders Association, 388 Franklin Ave, Amherst, Ohio. Carl Springer, Secretary.
Home Builders Association of Mahoning Valley, 53 Aylesboro Ave, Youngstown Ohio. C. E. McCallahan, Executive Secretary.
Home Builders Association of Mansfield, Box 191, Lexington, Ohio. Harley Watkins, Secretary.
Home Builders Association of Marion, 613 Oak St, Marion, Ohio. E. L. Mallinger, Secretary.
Montgomery County Builders Association, 127 S Main St, Dayton 2, Ohio. C. C. Miller, Executive Secretary.
Northwestern Ohio Contractors and Builders Association, 1582 Virginia Ave, Lima, Ohio. E. F. Gerber, Secretary.
Ohio Home Builders Association, 8 East Long St, Columbus, Ohio. A. H. Falace, Executive Secretary.
Home Builders Association of Sandusky, 227 McDonough St, Sandusky, Ohio. Wm. R. Henry, Secretary.
Clark County Home Builders Association, 1237 N. Plum St, Springfield, Ohio. E. L. Enstrom, Secretary.
Toledo Association of Home Builders, Inc, 322 Spitzer Blvd, Toledo, Ohio. Guy Roberts, Executive Vice President.

OKLAHOMA
Ada Chapter of NAHB, P. O. Drawer 127, Ada, Oklahoma. Erwin T. Hems, Secretary-Treasurer.
Home Builders Association of Lawton, 41555 Cast Ave, Lawton, Oklahoma. Irving C. Mattison, Executive Officer.
Miami (Okla.) Chapter of NAHB, 201 So Main, Miami, Oklahoma. Mrs. Fred Ernst, Secretary-Treasurer.
Home Builders Association of Muskogee, 726 Wall St, Muskogee, Oklahoma. L. A. Hunt, Secretary-Treasurer.
Norman Home Builders Association, 671 N Porter, Norman, Oklahoma. James R. Adair, Executive Secretary.
Bartlesville Home Builders, P. O. Box 278, Bartlesville, Oklahoma.
Murfrey Beacon, Secretary.
The Oklahoma State Home Builders Association, Room 328, Biltmore Hotel, Oklahoma City, Oklahoma. Gus Fields, Executive-Director.
Oklahoma City Home Builders Association, Room 328, Biltmore Hotel, Oklahoma City, Oklahoma. Gus Fields, Executive Secretary.
Ponca City Chapter of NAHB, 107 Whitworth Ave, Ponca City, Oklahoma. Roger A. Havens, Secretary.
Stillwater Chapter of NAHB, Box 248, Stillwater, Oklahoma. Leonard G. Herron, Secretary.
Tulsa Home Builders Association, Inc, 1035 Hunt Bldg, Tulsa, Oklahoma. Mrs. George White, Executive Secretary.

OREGON
Master Builders of Oregon, Portland Coke & Gas Co, Public Service Bldg, Portland, Oregon. J. A. Stevens, Secretary-Treasurer.
Portland Home Builders Association, 218 Platt Bldg, Portland 5, Oregon. John M. Richardson, Executive Secretary.
PENNSYLVANIA
Home Builders Association of Allegheny County, 1109 Standard Life
Home Builders Association of Fayette County, 62 Race St., Uniontown, Pennsylvania. Russell Hill, Secretary.
Home Builders Association of Greater Johnstown, Route 4, Johnstown, Pennsylvania. Mr. M. Custer, Secretary.
Lehigh Valley Home Builders Association, 1136 Cedar Crest Blvd., Allentown, Pennsylvania. Roma Dante, Secretary.

WEST VIRGINIA
Home Builders Association of Charleston, P. O. Box 393, Charleston, West Virginia. Robert W. Hill, Executive Secretary.

WISCONSIN
Home Builders Association of Milwaukee, 295 Hackett St., Beloit, Wisconsin. Glenn Webermeier, Secretary.

Puerto Rico
Home Builders Association of Puerto Rico, Box 485, San Juan, Puerto Rico. Louis A. Torresoguino, Secretary.

Rhode Island
Home Builders Association of Rhode Island, 71 Jackson St., Room 201, Providence, Rhode Island. Franklin A. Hunt, Executive Secretary.

South Carolina
Piedmont Home Builders Association, 29, Greenville, South Carolina. W. F. Christian, Jr., Secretary.

Tennessee
Home Builders Association of Chattanooga, 1803 Letch St., Chattanooga, Tennessee. John W. Card, Secretary-Treasurer.
Home Builders Association of Knoxville, R. 6, 607 Holston Hills, Knoxville, Tennessee. John W. Card, Secretary-Treasurer.
Nashville Home Builders Association, 606 Commerce Union Bank Bldg., Nashville, Tennessee. Marion F. Thomas, Jr., Executive Secretary.

Texas
South Texas Home Builders Association, 1001 Wilson Blvd., Corpus Christi, Texas. Frank M. Hight, Executive Vice President.
Home Builders Association of Abilene, Texas, 2001 No. 14th St., Abilene, Texas. Art Hill, Secretary.
Austine Home Builders Association, 204 Nalle Blvd., Austin, Texas. Roger Newhall, Secretary-Treasurer.
Home Builders Association of Dallas, Home Builders Audition, 209-11 Live Oak, Dallas, Texas. Roger A. Goodfellow, Executive Vice President.
Home Builders Association of El Paso, Chamber of Commerce, 310 San Francisco St., El Paso, Texas. Robert H. Crockett, Executive Secretary.
Home Builders Association of Fort Worth, 356 Majestic Blvd., Fort Worth, Texas. Harry E. Giddie, Executive Vice President.
Houston Home Builders Association, 535 Kress Bldg., Houston 2, Texas. William D. Hammer, Secretary.
Home Builders Association of Lubbock, 1300 4th St., Lubbock, Texas. Sam Lomons, President.
Home Builders Association of Sahana Area, 2471 Hased Ave., P. O. Box 2844, Beaumont, Texas. Clemmer Mornough, Executive Secretary.
Pemex Basin Home Builders Association, 1303 West Wall St., Midland, Texas. Jim Kelly, Executive Secretary.
Home Builders Association of San Angelo, 1900 W. Beauregard, San Angelo, Texas. Dean R. Chollar, Secretary-Treasurer.
San Antonio Home Builders Association, 111 Majestic Blvd., San Antonio 5, Texas. F. H. McLaughlin, Executive Vice President.
Texas Association of Home Builders, Inc., 512 Perry Brooks Bldg., Austin, Texas. Thomas D. Caldwell, Executive Secretary.
Texas Panhandle Home Builders Association, P. O. Box 2907, Amarillo, Texas. Miss Lois McDaniel, Executive Secretary.

Utah
Utah Home Builders Association, 39 Exchange Place, Salt Lake City 1, Utah. Earl F. Staton, Executive Vice President.

Virginia
Home Builders Association of Richmond, 2403 W. Main St., Richmond, Virginia. C. G. Yagel, Executive Secretary.

Washington

Tacoma Master Builders Association, 11035 Division St., Tacoma 3, Washington. J. Howard Kane, Executive Vice President.

West Virginia
Home Builders Association of Charleston, P. O. Box 2401, Charleston 29, West Virginia. Frank L. Pfeifer, Secretary.

Wisconsin
Madison Builders Association, Room 505 Cantwell Bldg., 121 So. Pinckney St., Madison 3, Wisconsin. L. E. Gerretson, Executive Secretary.
Milwaukee Builders Association, 259 East Wells St., Suite 555, Milwaukee 3, Wisconsin. F. A. Baehr, President.
Rock County Builders Association, 1200 N. Bluff St., Janesville, Wisconsin. Wm. Sanford, Secretary.

Rhode Island
Arkansas Association of Lumber Dealers, 727 Pyramid Bldg., Little Rock, Arkansas. DeMott Henderson, Secretary.
Building Material Merchants of Georgia, 1925 Ponce de Leon Ave., Atlanta, Georgia. Joseph C. Rowell, Secretary.
Central Kansas Lumberman's Association, Salina, Kansas. M. L. Jones, Secretary.
Central Missouri Association of Retail Lumber Dealers, Jefferson City, Missouri. H. Gohleman, Secretary.
Florida Lumber & Millwork Dealers Association, 2218 Edgewater Drive, Orlando, Florida. Mrs. Mike M. Bennett, Secretary.
Indiana Lumber & Building Supply Association, 219 N. Pennsylvania St., Indianapolis, Indiana. E. W. Ackerman, Secretary.
Intermountain Lumber Dealers Association, 712 Newhouse Bldg., Salt Lake City 1, Utah. C. W. Nordstrom, Secretary.
Iowa Retail Lumber Association, 1912 Grand Avenue, Des Moines 14, Iowa. W. H. Reade, Secretary.
Kentucky Retail Lumber Dealers Association, Lebanon, Kentucky. Donald C. Campbell, Secretary.
Louisiana Building Material Dealers Association, 528 Florida St., Baton Rouge, Louisiana. E. Herbland Ball, Secretary.
Lumber & Supply Dealers' Council of Georgia, 1925 Ponce de Leon Ave., N. E., Atlanta, Georgia. J. G. Rowell.
Lumber Dealers' Association of Connecticut, P. O. Box 1662, New Haven, Connecticut. William P. Brach, Secretary.
Lumber Merchants' Association of Northern California, 214 Front St., San Francisco, California. Frank Pendleton, Secretary-President.
Lumber Trade Association of Cook County, 30 North LaSalle St., Chicago 2, Illinois. Phoebe E. Hess, Secretary.
Lumbermen's Association of Texas, Second National Bank Bldg., Houston 2, Texas. Gene Ebernow, Executive Vice President.
Maine, Retail Lumber Dealers' Association, P. O. Box 236, Lewiston, Maine. Ralph E. Whelan, Secretary.
Maryland, Retail Lumber Dealers Association, 1201 G Street, N. W., Washington 3, D. C., Vice President.
Middle Atlantic Lumbermen's Association, 1528 Walnut St., Philadelphia 2, Pennsylvania. Robert A. Jones, Secretary.
Mississippi Retail Lumber Dealers' Association, P. O. Box 198, Jackson 115, Mississippi. E. B. Lemmons, Secretary.
Montana Retail Lumbermen's Association, 107 E. Main, Missoula, Montana. W. J. Howard, Secretary-Manager.
Nebraska Lumber Merchants' Association, Terminal Bldg., Lincoln 8, Nebraska. Phil Runion, Secretary.
New Hampshire Retail Lumbermen's Association, Meredith, New Hampshire. Harold Greaves, Secretary.
New Jersey Lumbermen's Association, 1060 Broad St., Newark 2, New Jersey. Edw. C. Frick, Secretary.
New York Lumber Trade Association, Grand Central Terminal, New York, New York. William E. Harris, Secretary-Treasurer.
North Dakota Retail Lumbermen's Association, P. O. Box 534, Fargo, North Dakota. Maynard A. Finch, Secretary.
Northeast, Missouri Lumbermen's Association, Columbia, Missouri. O. W. Hetrick, Secretary-Treasurer.
Northwestern Retail Lumbermen's Association, 339 East Avenue, Valley Civic Hall, Rockford 4, New York. Paul S. Collier, Secretary-Manager.
Northern Indiana and Southern Michigan Retail Lumber Dealers Association, South Bend, Indiana. Robert Chamberlain, Secretary.
Northwestern Lumbermen’s Association, Fourth Avenue South, Minneapolis 2, Minnesota. W. L. Radburn, Secretary.
Ohio Association of Retail Lumber Dealers, Green and Market Streets, Xenia, Ohio. Findley M. Torrence, Secretary.
Oklahoma Lumbermen’s Association, Leonhardt Bldg., Oklahoma City, Oklahoma. W. M. Morgan, Manager.
Oregon Retail Lumbermen’s Association, Western Lumber Co., 212 N. Russell Street, Portland, Oregon. C. A. Faris, Secretary.
South Dakota Retail Lumbermen’s Association, c/o H. W. Ross Lumber Co., Sioux Falls, South Dakota. Ralph J. McNerney, Secretary-Treasurer.
Southern Missouri Retail Lumber Dealers’ Association, Hayti, Missouri. W. T. Nethery, Secretary.
Southern California Retail Lumbermen’s Association, 111 West Seventh St., Los Angeles, California. Orvie W. Hamilton, Secretary-Manager.
Southwest Missouri Retail Lumber Dealers’ Association, Springfield, Missouri. Grover McSpadden, Secretary.

Southwestern Iowa Retail Lumbermen’s Association, c/o Crawford Lumber Co., Council Bluffs, Iowa. J. Rivers, Secretary-Treasurer.
Southwestern Lumbermen’s Association, R. A. Long Bldg., Kansas City 6, Missouri. Allan T. Flint, Secretary-Manager.
Tennessee Building Material Association, 711 Broadway, N. W., Knoxville 17, Tennessee. R. O. Brownlee, Secretary-Manager.
Texas Line Yard Retail Lumber Dealers’ Association, Waco, Texas. George H. Zimmerman, Secretary.
Vermont Retail Lumber Dealers’ Association, c/o E. R. Wiggins Builders Supplies, Chester, Vermont. Walter Kangas, Secretary.
Virginia Building Material Association, 3001 Monument Avenue, Richmond 21, Virginia. Harris Mitchell, Secretary-Manager.
Western Retail Lumbermen’s Association, 1319 W. Nickerson, Seattle 99, Washington. W. C. Bell, Managing Director.
West Virginia Lumber & Builders’ Supply Dealers’ Association, Box 1589, Fairmont, West Virginia. Sam H. Dierer, Secretary.
LISTED ALPHABETICALLY by states and sponsors in this section are those communities which responded to American Builder's roll call of all cities and towns which observed National Home Week in 1951. Their efforts in showing new homes, home remodeling, and building materials stimulated and renewed great interest in home ownership and home maintenance.

Alabama
- Birmingham Association of Home Builders

California
- Home Builders Institute (Los Angeles)
- Associated Home Builders of the Greater East Bay, Inc. (Oakland)
- Associated Home Builders of Sacramento
- Peninsula General Contractors and Builders Association, Inc. (San Mateo)
- General Contractors Association of Contra Costa County, Inc. (Walnut Creek)

Connecticut
- Greater Bridgeport Builders Association
- Home Builders Association of Hartford County (West Hartford)
- Home Builders Association of Greater New Haven

District of Columbia
- Home Builders Association of Metropolitan Washington

Illinois
- Chicago Metropolitan Home Builders Association
- H. H. Troop Lumber Co. (Kankakee)
- Quad City Association of Home Builders (Moline)
- New Athens Lumber Co. (New Athens)

Indiana
- Marion County Residential Builders, Inc. (Indianapolis)

Iowa
- Home Builders Association of Cedar Rapids
- Home Builders Association of Des Moines

Kansas
- Wichita Association of Home Builders

Louisiana
- Home Builders Association of New Orleans

Maryland
- Home Builders Association of Maryland (Baltimore)

Massachusetts
- Home Builders and Contractors Association, Inc. (Springfield)
- Master Home Builders Association of Worcester

Michigan
- Flint Association of Home Builders
- Grand Rapids Home Builders Association

Minnesota
- Minneapolis Home Builders Association
- St. Paul Home Builders Association

Missouri
- Home Builders Association of Greater Kansas City
- Home Builders Association of Greater St. Louis

New Jersey
- Atlantic Home Builders Association of New Jersey (Margate)
- Home Builders Association of Metropolitan New Jersey (Newark)

New York
- Home Builders Association of Albany
- Niagara Frontier Builders Association (Buffalo)
- Long Island Home Builders Institute, Inc.
- Home Builders Association of Westchester, Inc. (Mt. Vernon)
- Rochester Home Builders Association
- The Better Builders Association of Onondaga, Inc. (Syracuse)

Nebraska
- Home Builders Association of Lincoln
- Omaha Home Builders Association

North Carolina
- Conna Lumber Co. (Durham)

Ohio
- Home Builders Association of Stark County, Inc. (Canton)
- Home Builders Association of Greater Cincinnati
- Home Builders Association of Greater Cleveland
- Columbus Home Builders Association
- Montgomery County Builders Association (Dayton)
- Sandusky Home Builders Association
- Toledo Home Builders Association

Oregon
- Portland Home Builders Association

Pennsylvania
- Home Builders Association of Metropolitan Pittsburgh

Rhode Island
- Home Builders Association of Rhode Island (Providence)

Tennessee
- Home Builders Association of Memphis
- Nashville Home Builders Association

Texas
- Texas Panhandle Home Builders Association (Amarillo)
- Home Builders Association of Dallas
- Houston Home Builders Association
- Home Builders Association of San Angelo
- San Antonio Home Builders Association

Utah
- Utah Home Builders Association (Salt Lake City)

Virginia
- Richmond Home Builders Association

Washington
- El Monte Lumber and Fuel Co. (Elma)
- Seattle Master Builders
- Home Builders Association of Spokane, Inc.
- Tacoma Master Builders Association

Wisconsin
- Rock County Builders Association (Beloit)
- Milwaukee Builders Association
- Racine-Kenosha Home Builders Association

This listing is not necessarily complete, but is as complete as the record to date permits. Its purpose is not only to give credit where credit is due for the highly successful National Home Week of 1951, but to provide a source list of experienced Home Week sponsors upon whose work communities which have not yet participated might base their plans for getting into the Home Show Parade for 1952.
The Home Buyer is naturally impressed with the “extras.” National Storm Sash Adjusters add strong customer appeal to the house without materially affecting the over-all cost.

No. 85 Storm Sash Adjuster Set — Holds sash securely in position either open or closed. No rattling. 5 inch and 10 inch sizes. Made entirely of steel. Japanned or Cadmium finish. Packed one pair — one right and one left — in an envelope, with 1x7 screws.

No. 86 Noiseless Storm Sash Adjuster Set — Locks sash securely in closed position. Top window sash can be lowered all the way down without interference from the Adjuster. Size, 12 inches over all. Set is packed in a box. Consists of one right, one left and one No. 200 Pull. Cadmium finish only.

Save time this easy way!

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