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94:5

ARCHITECTURAL FORUM

THE MAGAZINE OF BUILDING



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The great Eastgate experiment —balcony living—skip floor planning —gay design—future profits (p. 114)

How to cut steel use 30% (p. 113)

Light and air laboratory to pretest room designs (p. 170)

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20% bigger rooms at 4% more cost (p. 130)

The big pinch in mortgage money (News)

AIA Convention pictures (News)

Next month: special issue on

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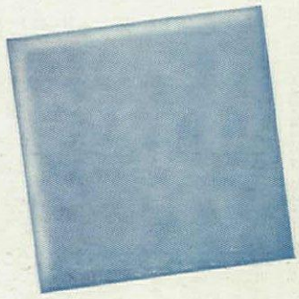

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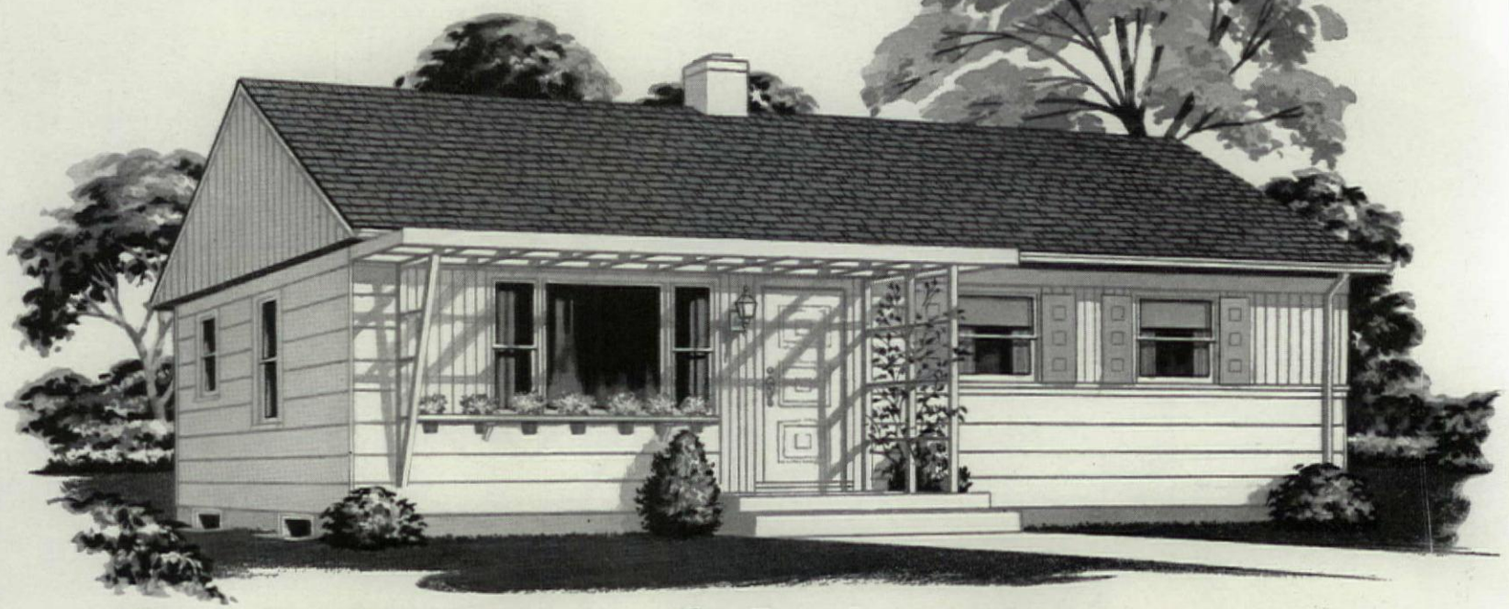

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THE MAGAZINE OF BUILDING

MAY 1951

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VOLUME 94, NUMBER 5

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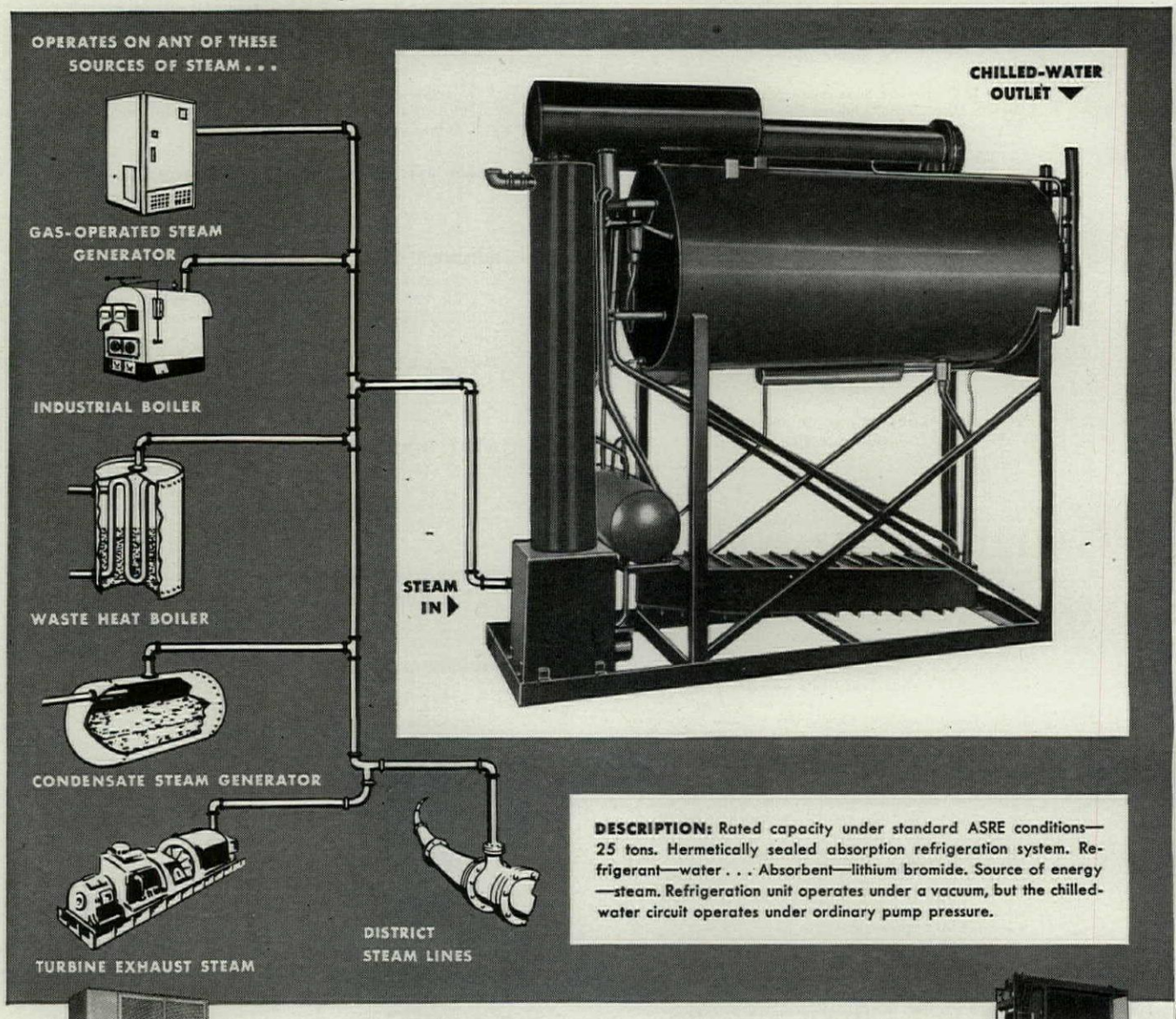

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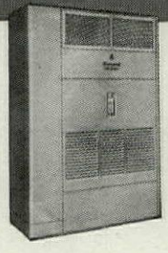

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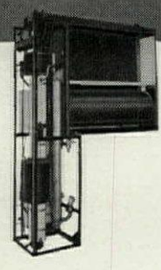

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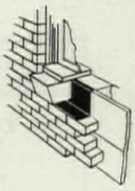

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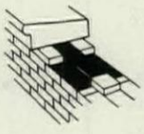

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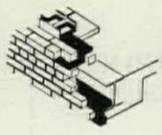

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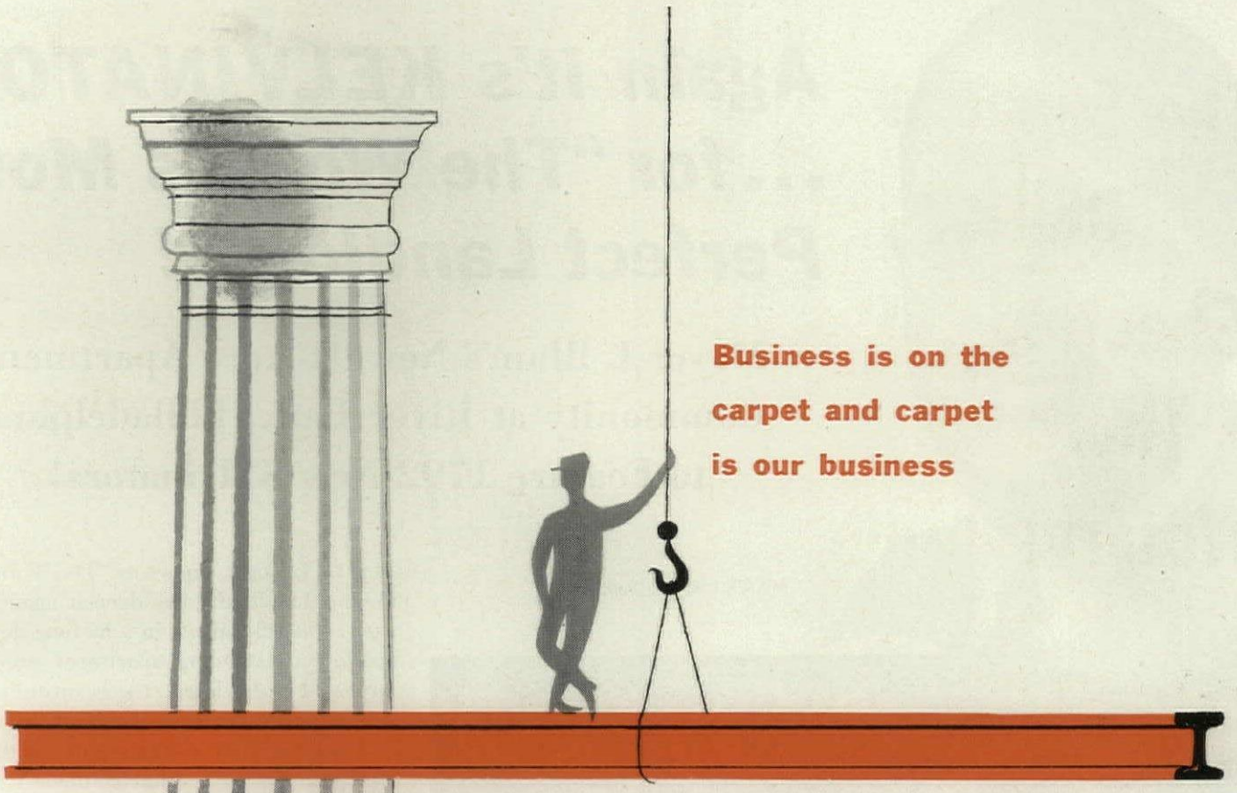

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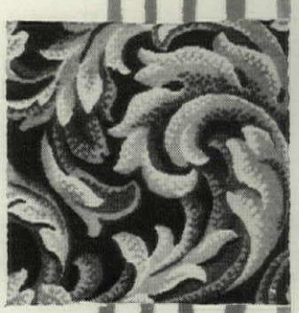



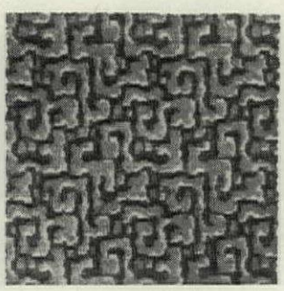

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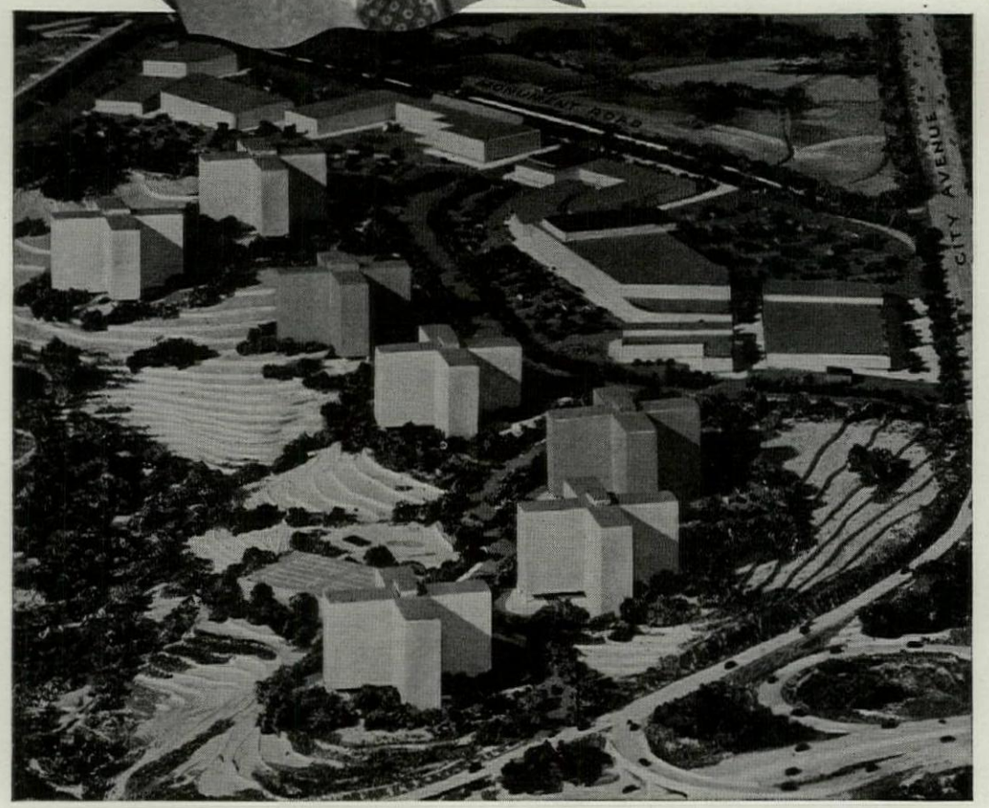

1792 Apartments—1792 Kelvinators! New Presidential Apartments are ideally positioned on a beautifully landscaped 91-acre site overlooking the Schuylkill River and Fairmount Park, Philadelphia. There will be a new Kelvinator refrigerator in each of the 1792 kitchens. Engineered and designed by Mayer I. Blum and Sons; Architects, John E. Sweet and Milton Schwartz; General Contractors, Turner Construction Company.

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CONFUSION UNLIMITED: officialdom gropes uncertainly with construction controls, but its left hand seldom knows what its right hand is doing. Industry cries for a top-drawer coordinator

Day by day the building industry's need for a top-level coordinator grew more apparent and more important. Nearly all construction boomed on at breakneck pace. But government planning and control (you can't mobilize without it) reached such a crescendo of confusion that Sen. Everett M. Dirksen snorted: "Chaos is on an organized basis in Washington today. In fact, stupidity is almost being perfected." As in World War II, the government had split responsibility for overseeing the country's biggest non-agricultural industry among half a dozen agencies. Results:

▸ NPA, forecasting the greatest materials shortages since mobilization began, cracked down harder on nearly all types of construction (see below). But nobody was doing anything important about saving the steel being wasted on nearly every building built (p. 113).

▸ DPA had granted 1,103 quick tax write-offs for $5 billion of plant expansion. But no one, complained speakers at the AIA convention (p. 28), was insisting that plants be dispersed against enemy attack. And it was not DPA, but an inter-agency committee, which was passing on creation of "critical housing areas" that plant expansions might cause. The Defense Department was subject to no civil construction control at all. Yet the impact of population shifts military plants could produce might prove the most important of all.

▸ The Administration clung to its announced 850,000 housing goal for 1951 although there were signs that this figure would be greatly exceeded. HHFAdministrator Foley told the House Appropriations Committee 850,000 was his housing target for next year, also. Yet nobody was making a serious effort to assure that either materials or credit would be available for that much housing.

▸ On the financial front, the Administration had upped interest rates on Government bonds and Defense Mobilizer Charles Wilson called on local governments to forego normal borrowing, both anti-inflation moves. But with the other hand, Government proposed to extend the life of the Reconstruction Finance Corp., whose underwriting of shaky businesses (like Lustron) constituted a boost for inflation. And, administration stalwarts were proposing to expand the authority of the Veterans' Administration to make direct mortgage loans, a step bankers viewed as both inflationary and socialistic.

▸ Announcing the amended M-4 order curbing construction, NPAdministrator Manly Fleishmann called it a move required by "the growing critical shortage of structural steel." But in New York, Contractor H. C. Turner Jr., one of the building industry's biggest steel buyers, observed that structural steel was now being quoted as available in 7 to 8 months, compared to 11 month delivery a short while ago. This led to immediate speculation that NPA's austerity-talk was chiefly aimed at persuading a balky Congress to pass the extension of the Defense Production Act, which by coincidence, went to Capitol Hill almost the same day. The *Wall Street Journal* huffed editorially: "It might be more than a coincidence . . . it might be."

The M-4 order. Expanding its already existing permit system for commercial construction, NPA would now require advance permits to build:

All factories or other public or private projects using more than 25 tons of steel. This took in such heretofore exempt items as schools, churches, hospitals, highways, utility and railroad building.

All single-family homes costing over $35,000 (excluding cost of land acquisition, attorneys, architects, financing and personal property.)

All apartments over 3 stories plus basement.

This May 3 blow smarted all the more because NPA let it fall brusquely. The 28-man construction advisory committee was called to Washington on the day the order was issued, handed the proposal, asked to rubber stamp it. (The Defense Production Act required NPA to "consult" with leaders of affected industries before imposing restrictions.) The advisory group voted unanimously against the new curbs. One NPA man remarked this might be the last time he would need the committee's services. If NPA still underwent the motions of consultation, it would use smaller, "more workable" groups composed of segments of the industry.

Loopholes. The spurned advisers managed to score a few parting points, however. NPA had been toying with requiring permits for all houses built in groups of 10 or more. This was dropped though the 25 ton steel limit for sewer, water, gas and street work could still require an O.K. for big developments. In one respect, restrictions were eased. NPA amended its definition of "start of construction" to include "substantial site clearance, including demolition." This would make some projects, which had been cut off at the pockets by the January 13 freeze on commercial construction, again eligible to proceed. Besides, it was clear NPA had too little staff to disapprove many requests. It was conceded the agency already was six weeks behind in processing applications under the old rules.

By April's end, 1951 construction stood at $8½ billion, a full 20% above the corresponding figure for last year. But public and industrial building formed the backbone. (Military and naval construction was up 422%.) Housing, instead of showing its normal April spurt, slumped to 88,000 starts, 7% beneath March's 95,000. This left 1951 housing 65,400 starts below last year's total at the end of April.

The future? What lay ahead for commercial and industrial building was now at the whim of officialdom. Both were clamped in mobilization's straitjacket. For homebuilding, optimistic plans of individual

(Continued on page 12)

IN THE NEWS

Among the next 23 pages, you'll find reports on these significant developments:

AIA convention	p. 28
HHFA fumbles anti-waste drive	p. 25
Builders pan FHA property rules	p. 21
CMP gets cool reception	p. 13
The mortgage rhubarb	p. 12
Co-op activity rises	p. 12
Portland 608 gimmicks	p. 20

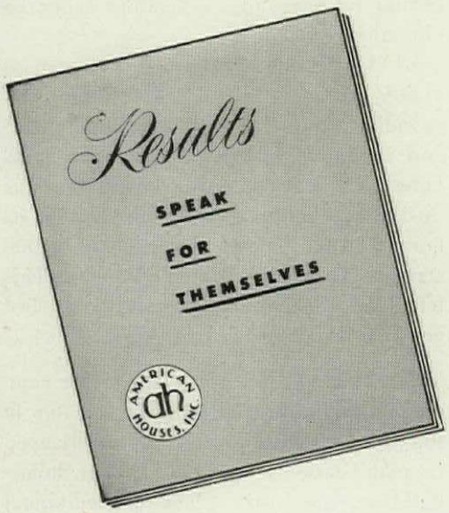
LAST MONTH'S WASHINGTON DIARY

3/31	*NPA postpones ban against use of aluminum for over 200 civilian products to May 1 (M-7).*
4/1	*NPA relaxes restrictions against use of copper in fins for unit heaters, ventilators and blast heating coils (M-12).*
4/12	*NPA sets formal starting date for Controlled Materials Plan as July 1.*
4/16	*NPA prohibits new construction starts on swimming pools and tobacco warehouses.*
4/16	*NPA removes certain scarce items (e.g. paint) from list of items obtained by Defense Order rating for maintenance, repair and operating supplies (Amendment of Regulation 4).*
4/20	*NPA permits limited use of aluminum during May and June in manufacture of more than 200 consumer items previously banned after May 1.*
4/20	*Dr. George Taylor named temporary chairman, Wage Stabilization Board. Other 17 members to be named soon.*
4/28	*President Truman appoints Edwin T. Gibson Acting Chief of the Defense Production Administration, succeeding William H. Harrison, who resigned effective May 1. Gibson is executive vice president of General Foods Corp.*

This method of building has given a new meaning to prefabrication



Sylvan Knoll Apartments, Stamford, Conn.
122 rental units built with American Houses
Builder: Arthur Olson, Inc., Noroton H'ghts., Conn.



Over the past two decades, the word prefabrication has assumed a new and important meaning in the minds of building people.

Everyone interested in the design, construction, financing and sale of homes recognizes this fact: *The use of prefabricated structures is not only the best...but the most economical way to build.*

What has brought about this recognition?

The answer: the *correct* use of prefabrication.

American Houses, Inc. began its operations in 1932, based on the concept that manufacturing standardized houses and shipping them as complete "packaged products" to sites would not prove entirely satisfactory.

This company sought a flexible method that would enlist the support of architects, builders, real estate men, financial institutions, government agencies and home owners.

Such a method has now been operating successfully at American Houses, Inc. for years.

With this modernized method, you have a product and a system that lets you design, build or finance what is in demand—low-cost or luxury houses . . . large or small rental and sale projects . . . defense housing . . . military housing.

Investigate all the merits of American Houses' method of building. Find out for yourself how American Houses, Inc. can help you build better, faster and more profitably. Our plants are now serving most of the area east of the Mississippi. Send today for our new illustrated brochure, "Results Speak for Themselves."

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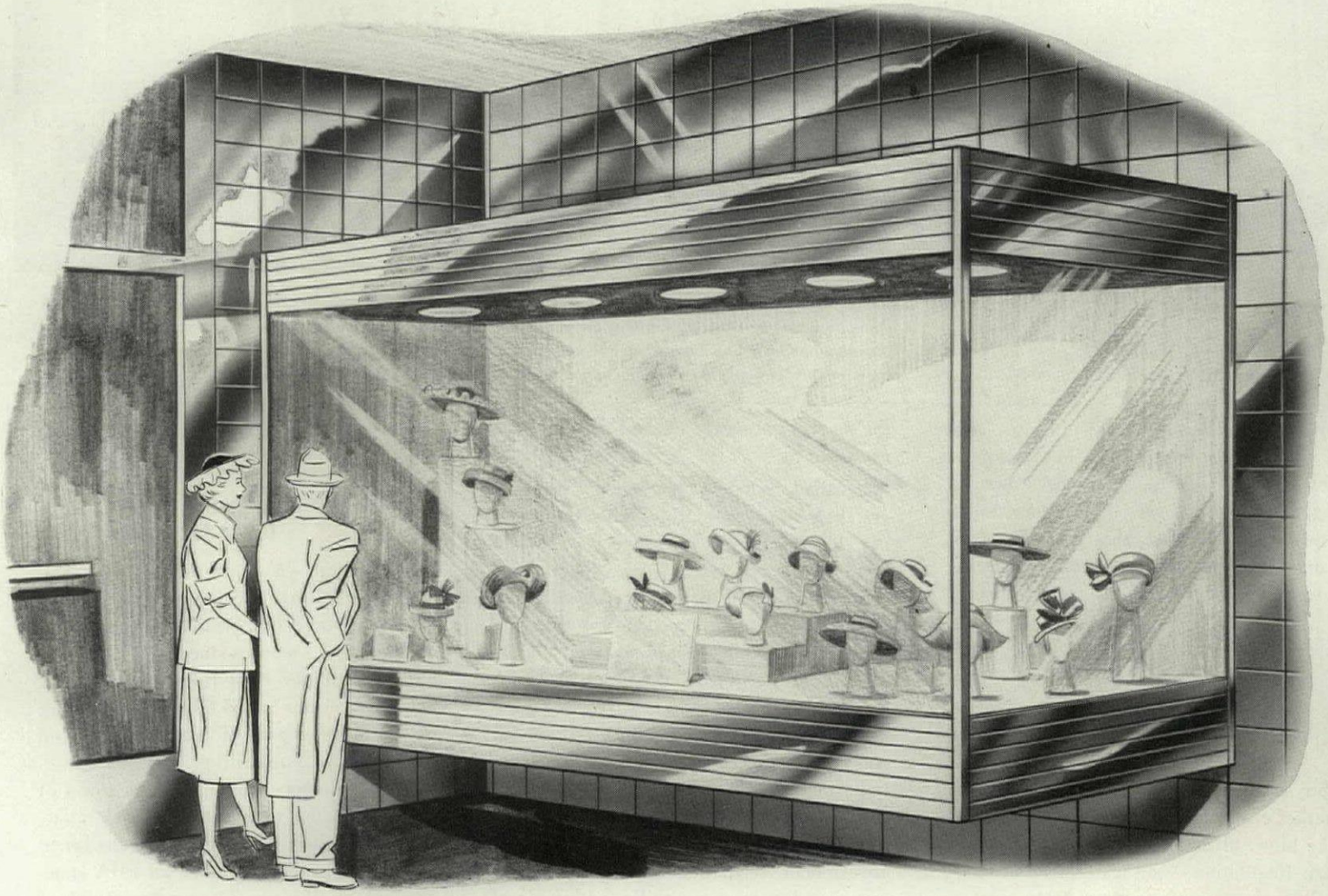

Shining Example of Modern Architecture...

The shoe shops, drug stores and filling stations of tomorrow will be fronted with stainless steel, for no other material commonly used in storefront construction offers so many advantages — and at a cost greatly beneath most expectations.

Stainless has tamed the weather. It strongly resists rust, corrosion and oxidation, and because of a low coefficient of expansion, it will not weaken or "come apart at the seams" under the severest weather conditions.

Stainless costs less than most people suppose because of a superior strength that allows manufacturers to fabricate of a lighter gauge that is easier to work and less expensive.

These many outstanding features, plus the unsurpassed beauty of stainless steel, are why today leading architects everywhere point to storefronts of stainless as "shining examples of modern architecture."

STAINLESS STAYS NEW FOREVER

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Sharon, Pennsylvania

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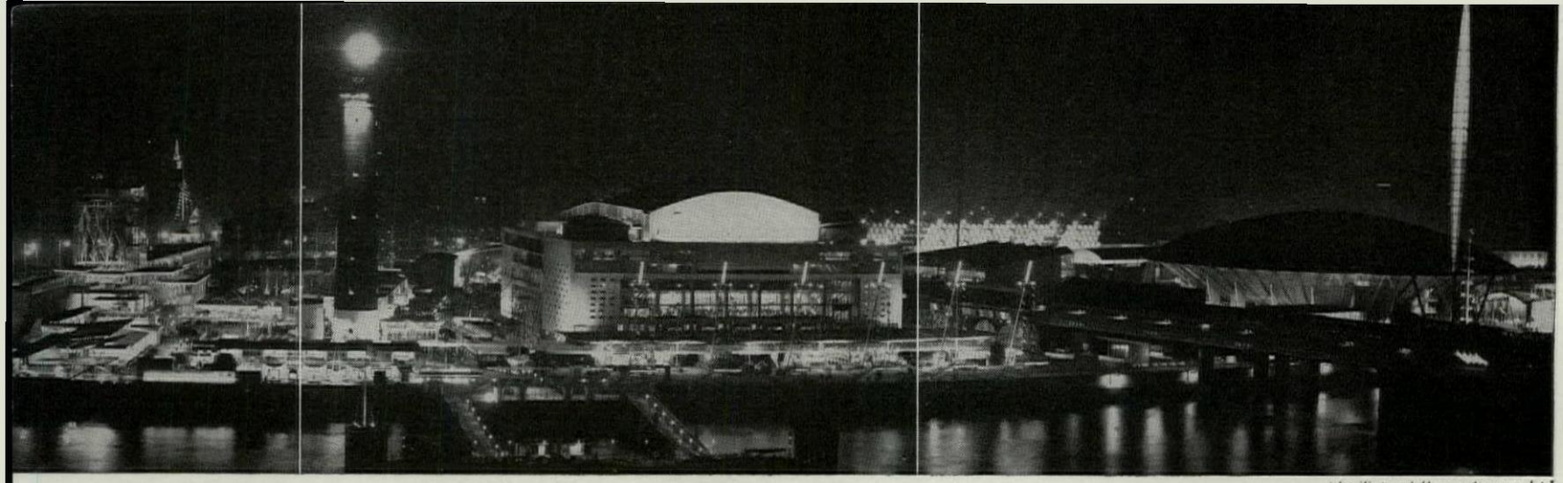
SHARONSTEEL



The Topical Press Agency Ltd.

Festival of Britain

Britons this month opened what they hope will be their biggest postwar tourist bait, the Festival of Britain. Centerpiece of the five-month show, the South Bank Exhibition on the River Thames between London's Waterloo and Westminster Bridges, presented a nocturnal glow of colored floodlights. Architecturally, its high point was the Dome of Discovery (extreme right, skylon). With height of 97', diameter of 365', dome was rated world's largest.

builders tended to gainsay industry cries of impending bust. THE MAGAZINE OF BUILDING'S sister publication, FORTUNE, suggested after a survey that builders might reach 1,250,000 starts this year. But Government controllers were set against this. And they held most of the trump cards.

MONEY . . .

. . . pinch on mortgage funds raises hob with builders

The sudden tightening of the mortgage market clipped home building on the chin. The blow, all hands agreed, was far stiffer than Regulation X or materials shortages. As usual, regions farthest from eastern money centers felt the pinch worst.

In California, Secretary John I. Hennessey of the State Home Builders Council reported that lenders had backed out of verbal promises to finance 50 projects totaling 7,340 homes since the Treasury boosted interest rates on long term Government bonds in March. Typical victim was Builder Earl W. Smith of Berkeley. Smith began taking orders in early April on a 1,000 home cooperative in the San Francisco suburbs, only to find a few days later that a New York insurance firm would no longer guarantee to buy the permanent mortgage. "We can stall for about a month," said Smith. If he still had no loan, he might have to return down payments.

One big Fort Worth builder was left holding the bag for nearly $1 million worth of financing by the same route. Said Vice President T. L. Bradford Jr. of Southwestern Life Insurance Co. in Dallas: "Most of our eastern concerns have withdrawn completely from the market. All 4% (VA) money is scarce and 4½% (FHA) money is growing scarcer every day."

In Seattle, where GI loans were selling at 97½ (in most other spots 96-7), Builder Albert Balch gloomed: "There doesn't seem to be any way around the break in the market unless the GI and FHA interest rates are raised."

Indigestion. What had happened? To bankers, the answer was simple. When the Treasury hiked interest rates on Government bonds from 2½ to 2¾% and the Federal Reserve let bond prices drop below par (which amounts to increasing interest), interest rates on industrial bonds immediately rose in proportion. But interest on FHA and VA mortgages remained frozen by administrative fiat. So investors felt money was better placed in other loans. More important, however, there was already a shortage of funds available for investment. Savings banks dipped heavily into their government securities last year to find money to buy mortgages. But with Federal bonds selling under par, this could now be done only at a loss. Insurance companies and other lenders (except savings and loan associations) were heavily committed in advance, many of them in anticipation of selling Government bonds to buy 1951 mortgages. So even big moneybags like New York and Prudential Life seized any available loophole to back out of commitments. Most lenders refused to buy new 501 VA mortgages at all. FHA paper, which commanded a premium of 102 last year, slumped to par. Retaliating, builders fanned fires of resentment among veterans' groups, who in turn revived talk of more direct government lending.

How long a drought? Most experts agreed the money pinch could not last forever. Overtime pay in war plants may push savings up this fall. Investors will catch up with advance commitments. Rearmament will begin to dry up alternate investment channels. Credit and materials controls would reduce the amount of housing seeking mortgages. Or FNMA might get back actively in the market. But as to when the picture would brighten, experts differed all the way from two months to ten. One thing seemed certain. Neither FHA nor VA will raise interest rates.

MARKET . . .

. . . low down-payments win favor for co-op tracts

Builders were wising up that the new gimmick for selling housing with low down payments was FHA Section 213, as cooperatives. In 13 months since the system was written into the 1950 Housing Act, FHA had applications for 55,000 units involving $467 million worth of construction. And the deal was snowballing.

As the framers envisaged it, a group of friends would hire an attorney, pick a site, pay an architect to draw floor plans for at least 12 units, then file for an FHA statement of eligibility. The process involved time, red tape and bickering. Nine out of ten attempted co-ops flopped before a nail was driven.

Urge to survive. Most builders developed interest as they cast around for work to keep their organizations together after expiration of FHA's free and easy Section 608, with its no-capital, all-Government-risk features (THE MAGAZINE OF BUILDING, Jan., '50, p. 97). Section 213 takes no builder investment either. As middleman, the builder merely organizes a group of customers, takes his profit out of construction as the contractor.

There are two types of 213 mortgages. So far, applicants prefer the management-type two to one. Under this plan, a single mortgage covers the entire project for its 40-year amortization term. Sales-type co-ops, on the other hand, may be broken up into individual mortgages after construction. All 213s bear 4% interest, plus ½% for FHA insurance. Currently this makes it hard to find lenders (see above) although financiers like the fact that payment-collection costs on management type 213s run only ⅛%, instead of ½% on individual loans.

To buyers, Section 213 with its maximum loans of 83% to non-vets and 88% to ex-

GIs means substantially lower down payments than Regulation X permits on other types of housing.

California ranch style. In Palo Alto (Calif.) Builder Joseph L. Eichler was offering the handsome, three bedroom and one bath homes hailed as "Subdivision of the Year" (THE MAGAZINE OF BUILDING, Dec., '50 p. 83), for $13,000, with only $1,500 down and $72 to $88 a month. Normally, he said, the price of the home would be $4,300 to $5,000 down to non-veterans, with monthly payments of $70.

Busiest 213 area in the U. S. so far was New York, where competition keeps builders keen. Also active were Michigan, Wisconsin, and Washington, D. C. In Oklahoma, the American Legion was organizing 213 projects. Texans evinced no interest. Said Dallas Builder H. D. Lewis: "It's too socialistic. It would probably go over well in the congested areas of the North and East, but we're too individualistic . . ." In Seattle, a glut of 608 apartments left little market for 213 promoters. In Chicago and Philadelphia, builders were waiting to size up the market more. Commented Nat Wolfsohn, vice president of Eastern Mortgage Service Company: "Philadelphia builders are always a year behind New York. It took them that long to get busy on 608s."

Chicago's Philip Klutznick, housing official turned builder, cast his eye on the future, observed: "I think as time goes on, there'll be more activity in this field, because it offers an opportunity when nothing else does."

DONORA REVISITED

Within a year after the 1948 Donora smog disaster, in which 22 died and 5,910 were made ill, the market value of Donora property, principally residential, declined 9½%, according to the Pennsylvania State Tax Equalization Board.

MATERIALS . . .

. . . controlled materials plan goes into effect July 1

Foresighted contractors had squirreled away towering stocks of prospective shortage items like pipe, steel sheet, wire and nickel plate. So the building industry reacted coolly to last month's announcement that NPA will impose its Controlled Materials Plan on July 1.

A big Los Angeles builder scoffed: "That plan was inspired when the world situation was bad. It's just one of those red tape follow throughs. . ." One of Long Island's biggest homebuilders remarked, "We may be in an ivory tower, but we've got all (the supplies) we need."

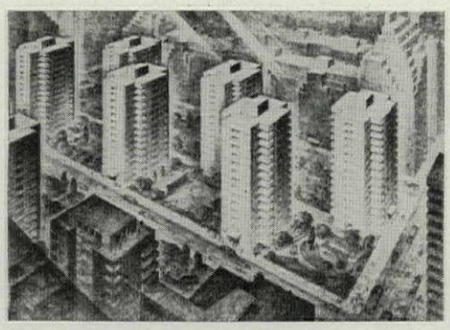
Under CMP, the National Production Authority would dole out steel, copper and aluminum quarterly in specific quantities for defense and essential civilian purposes. No effort would be made to channel what's left over. Civilian housing and the auto industry, among others, will scramble for the residue. How much will be left for civilian use remained so far an official secret. *Iron Age*, authoritative *Steel Industry Journal*, guessed that CMP would leave only 25% of the supply for unallocated civilian uses. One Government insider said by July the pinch on plumbing equipment, cast iron soil pipe, furnaces and other metal products would be "really felt." By September, he insisted, building industry will be yelling "murder."

Despite such talk, the approach of CMP triggered only a minor new scurry for materials. Said Executive Secretary Charles Huggett of Chicago home builders: "I don't think there's going to be enough of a shortage to make black markets interesting."

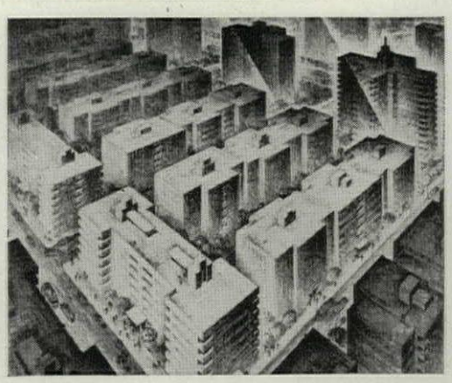
HOT AIR, COLD AIR

Uncle Sam's chief real estate man, Jess Larson of General Services Administration, last month gave Congress his appraisal of renting air conditioned office buildings: "Increased efficiency of the workers and elimination of lost time due to excessive heat . . . offset the extra cost."

(NEWS continued on page 17)



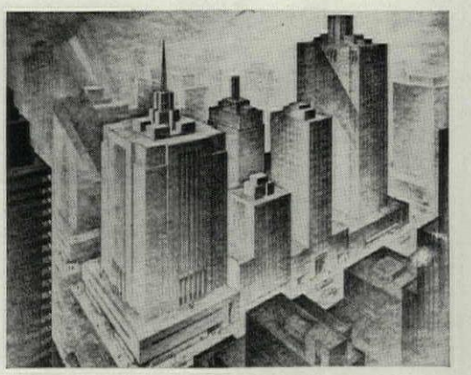
Residential area with 14-story apartments and 25% coverage, density of Stuyvesant Town (floor area ratio 3.5).



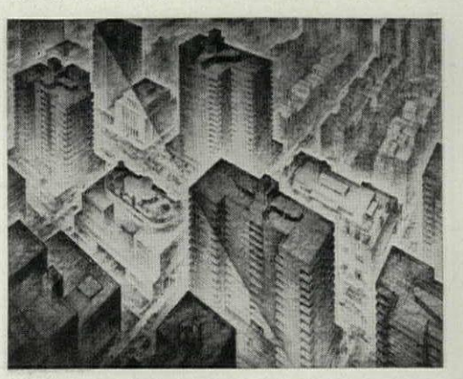
Second plan for residence zone with 3.5 floor ratio alternates six-story, 12-story apartments.

. . . New York zoning plan would end cakemold offices

New York City's proposed new zoning law, first presented by THE MAGAZINE OF BUILDING (Sept., 1950, p. 122) was formally issued last month after a seven month delay due to political wrangling. Calling for sweeping changes from the city's archaic 1916 ordinance, the 290 page study prepared by planners Harrison, Ballard & Allen would free Manhattan sky-scrapers from the cake-mold imposed by setback restrictions. How the plan could change the city's appearance is depicted above. Three controls would keep bulk of buildings within bounds. "Floor Area Ratio" would fix the total floor area of a structure at a specified multiple of lot size, e.g. a Grand Central skyscraper might have floor area 15 times the size of its site. (This limits population density.) "Angle of Light Obstruction" would give each zoning district a specific angle of light that may be blocked out by a building. "Area for Light Access" would require an open area for light to reach every window of a building. Other changes: more enlightened separation, or mingling, as the case may be, of residential, commercial and industrial areas; mandatory off-street parking and loading facilities; substitution of a single set of 38 zoning districts for existing (and confusing) three-map system. Though approved by local AIA and important civic groups, the plan still faces a spirited round of discussion before amendment and passage, expected within a year.

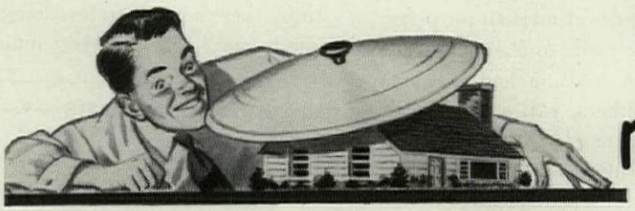


Proposed top density commercial and manufacturing districts (floor area ratio of 15).

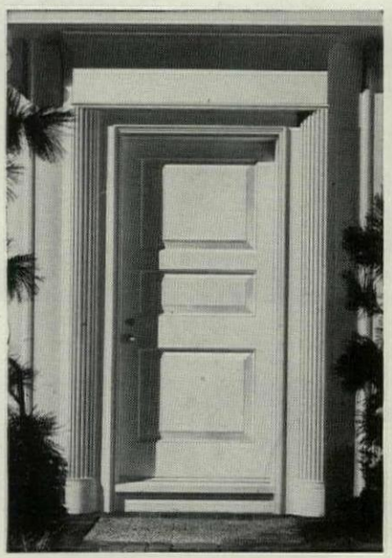


Maximum development for mixed commercial and residential area, such as Madison Avenue, north of 60th Street.

How to raise value *WITHOUT* raising the "lid"!



Even when there's a definite "lid" on home building costs, you can still increase eye-appeal—salability. The answer is Curtis Woodwork. It adds the extra distinction that means extra value—at a cost that fits comfortably into a modest building budget. Here are the reasons why:



It's hard to believe that this beautifully proportioned Curtis entrance with its fine detailing is so reasonably priced. This design—No. C-1742—shows why Curtis entrances provide more for the money. Frame is of durable ponderosa pine with oak sill, and consists of cap, jambs, casings, pilasters, architraves, plain or threshold sill and apron.



There's no need to forego the charm of a well designed mantel—if you choose a Curtis design. This mantel—C-6074—is of Colonial origin, but differs decidedly from those of the eighteenth century, reflecting the changes of our modern living. It follows that trend, without sacrifice of beauty and detail. The bowed fascia accentuates its charm.



Distinguished storage space is easy to provide—at modest cost—with a Curtis cabinet like this. The fibrous composition molded "shellback" may be painted a different color than the cabinet. There are three scalloped and molded edged shelves above counter and one in lower compartment. Made only for corner installation. Design C-6515.

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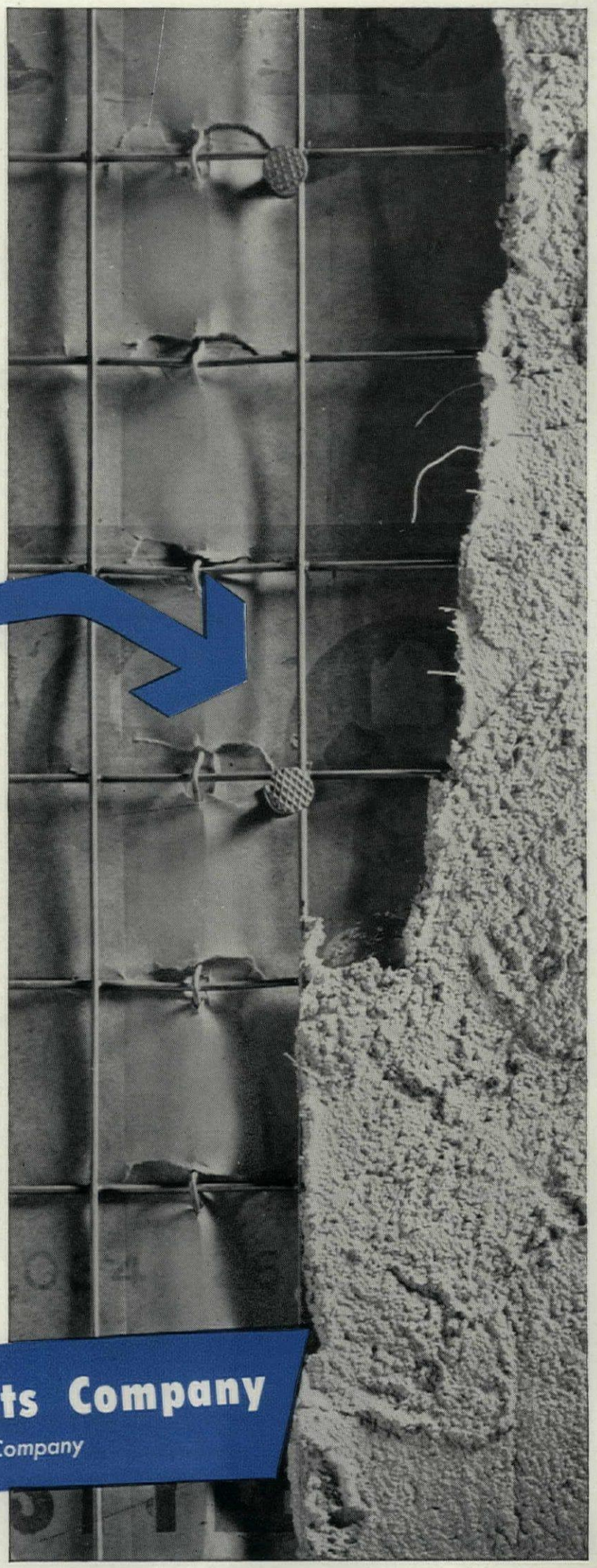

Look closely at the actual-construction photograph. Notice that the Steeltex mesh is heavy, and the galvanized wires are welded together for greater rigidity. This provides positive protection against later distortion by actually strengthening the entire wall. Notice also the tough, double-ply waterproof backing. This not only protects the structure, it assists proper curing of the stucco slab. Steeltex backing and mesh are applied in one operation, thus saving money. For further good reasons for specifying Steeltex, see Sweet's or write for catalog D.S. 131, Dept. MB, Pittsburgh Steel Products Co., Grant Building, Pittsburgh 30, Pa.

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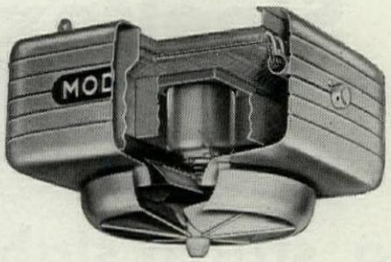

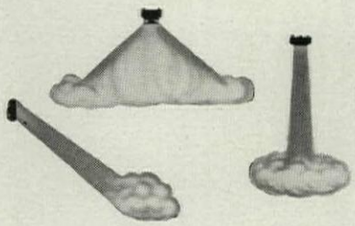

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EXAMINE ECONOMY

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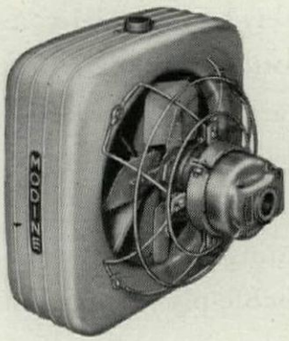





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IN COLOR



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Year after year, the popularity of Briggs Beautyware has been steadily growing with builders, plumbers and home owners everywhere. There are, of course, good reasons for this acceptance. For example, Briggs fixtures are sturdily built for long-lasting dependability, yet all unnecessary dead weight has been eliminated to simplify installation.

They are available in four beautiful pastel colors costing only 10% more than white, when purchased in complete sets. They offer many saleable features such as the safety bottom bathtub, large capacity lavatory and quiet flush closet—all stain-proof and acid-resisting.

For the second time in as many years, Briggs Beautyware was honored by the American Society of Industrial Engineers with the Merit Award. This award is granted for leadership in research, engineering, design and manufacture.

As the only manufacturer in this field to be so honored, the award is a testimonial to the quality of Briggs products and the achievement of the Briggs organization. Of this we are proud.

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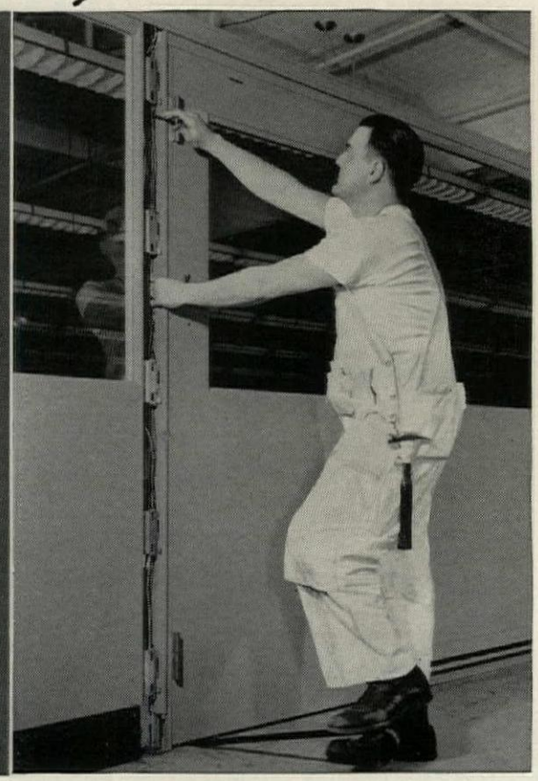

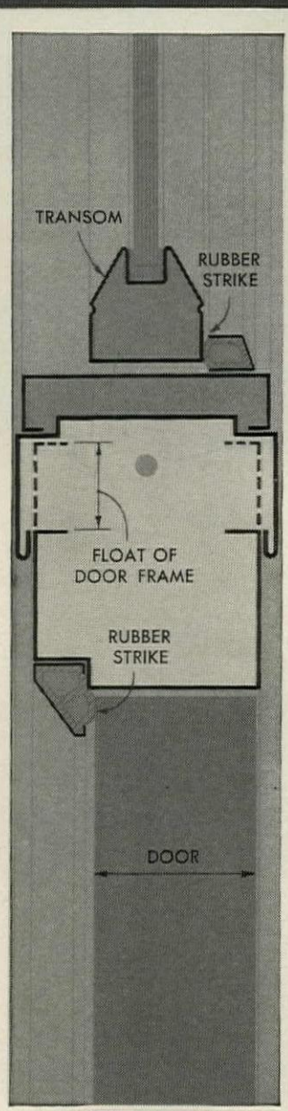

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PUBLIC HOUSING ...

... House votes a death sentence by whacking its budget

Almost unnoticed, the House of Representatives sliced public housing's throat. Although only 42,900 units of public housing were begun last year, President Truman had "reduced" the program to 75,000 units for fiscal 1951-2. The House Appropriations Committee whittled that to 50,000. Same day that NPA's announcement of stricter building controls hit the headlines, the House trimmed the 50,000 down to 5,000. The action was barely mentioned in press stories. Yet if the cut stood, the present incarnation of public housing looked dead.

Such a *coup de grâce* had been a long time in the making. Public housing came within three votes of being cut out of the Housing Act of 1949—even in the hands of a Congress elected with Truman in 1948. The Republican comeback last year stacked Congressional cards against it. Astutely, anti-public housers waited until they could knife it as part of a popular drive to trim the budget to avoid higher taxes.

Industry shed no tears, either, when the House Appropriations Committee knocked nearly $3 million off the Public Housing Administration's housekeeping budget.

LAW ...

... committee vote imperils BLS building reports

Slicing at other items in the nondefense budget, the House appropriations committee seemed unable to tell sheep from goats. It made goats out of two prize lambs of the building industry, FHA and the Bureau of Labor Statistics' construction division. Following somewhat specious reasoning, the committee decided that since building is being trimmed anyway, BLS does not need as much money to chronicle month by month starts. The construction division was cut 75% from $695,000 to $150,000. This meant that for all practical purposes, the Government would be forced to discontinue collecting and publishing housing and public construction figures. Studies of construction characteristics, rents and selling prices would be completely out.

The shellacking FHA took was milder, but made even less sense. The committee cut FHA's administrative budget by $536,000, trimmed $2,000,000 from funds to run its field offices. This economy, however, would not save the taxpayer a dime. Like any insurance firm, FHA pays its cost of doing business from fees and premium payments received. The agency has been self-supporting since its inception. All the cut would do was raise FHA's already ample insurance reserve fund.

Industry leaders thought the only chance for repairing the damage lay in the Senate toward the end of May.

... defense housing bill bumps into war of attrition

The Defense Housing Bill was stalled again. Even such strange bedfellows as the CIO and the National Association of Real Estate Boards had lined up against the Senate version of it. So administration leaders in the House prescribed a cooling off period. Best guess was no final legislative action before June.

The delay worried builders. Their regular bread and butter, a $1½ billion more insuring authority for FHA Title II, had been restored to the bill by the House banking committee. (FHA was due to run out of its existing Title II funds in mid-May.) And the Democratic majority warned they would block any action to give FHA its commitment power in a separate law.

Under the circumstances, builder objections to the Senate housing bill would be muted for fear loud complaints would only lengthen the war of attrition. But NAHB was convinced that Title IX, which promised best hope of rental construction in defense areas, had been rendered unworkable by Senate amendments. In a burst of righteous indignation over the 110 and 120% mortgages that some Senators said some builders finagled under World War II's Title VI program, the Senate sharply limited cost items attributable to the mortgages. First, expenses for land, legal fees and assemblage costs were ruled out. Then prime contractor's profit was barred on the theory that in nine rental housing cases out of 10 the builder-owner and the prime contractor were the same man. Cried industry spokesmen: instead of 90% mortgages the act was supposed to provide, the loan ratio would now drop to about 80%—less generous financing than present FHA law. No homes would be built.

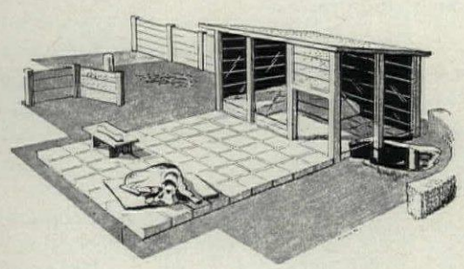
Labor and public housers had these gripes: 1) Cost limits on defense housing were hiked (to $8,100) above reach of most workers, and 2) too little government housing was set up for remote areas where private enterprise might not build at all.

Government housing chiefs were inclined to agree the Senate botched things. But they felt a few deft corrections still could thwart mortgage milkers without wrecking the bill. One possibility was an amendment worked out by HHFA experts. It would limit mortgages to cost of construction minus land and other outlays, but including the builder's profit.

... controls, packaged with new defense production bill, face fight

As expected, the President's request for an extension of the Defense Production Act went all out in its bid for full economic powers. In addition to a general tightening of the present law which expires June 30, he asked for a complete overhaul of rent control to consolidate it with the over-all defense program. Such a hook-up would provide the slight consolation for the real estate fraternity of not being singled out for con-

(Continued on page 20)



... solar dog house ribs modern design

The San Francisco Chronicle, whose coverage of architecture is California's keenest, poked whimsical fun last month at Bay area style and architects who take its cliches seriously. In a deadpan piece of spoofing, Sunday department writers Al Zelver and Barney Clark turned their attention to housing the dog in the west, "where living is outdoor and bones are preferred charcoal-broiled out on the terrace." Findings (see cut): "planned by a Bay area architect who believes the dog-house is a machine for living, the orientation provides a maximum of year-round outdoor living. With the additional feature of solar heating, no dog need spent winter days huddled under the kitchen stove, even if he could find a modern stove he could get under . . . Too often, the so-called dog lover shelters his pet as though he really hates him. Proportions are out of scale to the dog. The house is furnished with a chewed up gunny sack. There is no site planning. Result: a slum area for dogs." The Chronicle's doghouse substituted floor to ceiling glass for "dark tunnel entrance," offered privacy "through planting a hedge and a few shrubs." Terrace of varnished, end-grain wood blocks was declared "ideal for lounging on those long, lazy, summer dog-days." Pool, penetrating space through one wall, "is suitable for drinking from or gazing upon." Low screen hid "dog's other outdoor living appointments: digging yard and hardwood post."

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scription; would make them part of the general draft. Thus they might get their discharge papers along with other business.

But Congress seemed likely to turn thumbs down on any fond hopes the government planners might have for making industry do the goose step; would end up by toning down the stabilization powers below the present level. There was little chance the new act would pass before June 30. Congress probably would have to vote a 90 day extension of the old one. To keep rents in line Truman insisted on:

1) power to control rents on all housing where and when needed.
2) continued controls on housing now under control.
3) authority to make adjustments up and down for inequities and hardships.
4) limitation of decontrol process to places where demand for rental housing has been met.
5) strong control over evictions.
6) extension or rent control for the first time to commercial property.

Congress would give this program a rough ride. Besides balking at expansion of curbs on residential rents, the lawmakers gave unmistakable signs of being dead set against commercial rent control. Chairman Maybank of the Senate Banking Committee said flatly this would be set aside for further study. "We have to find out more about this before we do anything," he said. Also headed for the Congressional wastebasket was Truman's request for power to apply credit regulations to sale of existing houses.

WALL TO WALL

For the first time, FHA last month approved inclusion of wall-to-wall carpeting in mortgages for multi-family rental housing.

... capital gains tax exemption for home sellers gains support

Before springing the bad news about the new tax bill it was writing, the House Ways & Means Committee voted tentatively to give homeowners a break suggested by the National Association of Real Estate Boards. When circumstances such as a shift of jobs to another city compel them to sell their houses and buy others, the committee would exclude them from the present capital gains tax of 25%.

To be eligible for the exemption, a home owner would have to use the proceeds from the sale of his old house to buy a new one within a year. He would only be excused to the extent that he plows back his profits into a new house. He would have to fork up for any overage. The loophole would also apply to new homes purchased a year before old ones were sold. Reason: a homeowner might be bounced to another city on short notice.

... committee on defense housing areas keeps its rejects secret

By the end of the first week in May, six cities about to burst their housing seams had been designated critical defense areas. Over 100 had put in bids for the rating, at least two had been turned down. Deferring to local feelings, Ralph Kaul's inter-agency critical areas committee decided not to announce the rejects. It just notified the petitioning mayor, or civic group of the denial. Explaining why, the committee pointed out that the label sought was no unmixed blessing: once a city was declared shy on housing, mobilizers would try to keep it from getting more defense work.

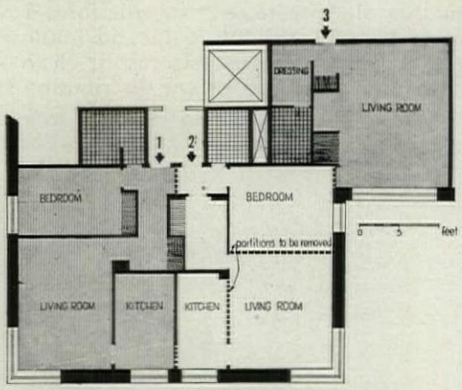
Latest additions to defense areas: Arco, Blackfoot, and Idaho Falls, Idaho, atomic plant towns where credit rules were relaxed for 500 houses; San Diego, Calif., relaxed credit for 4,000 rental units and 2,000 for sale; Corona, Calif., thrown off balance by a guided missiles laboratory, for 150 units; and Colorado Springs, Colo., scene of big Air Force expansion, 1,000 units; also Star Lake, N. Y., for 75 units.

DESIGN ...

... Portland builders finagle bigger 608 mortgages with temporary partitions

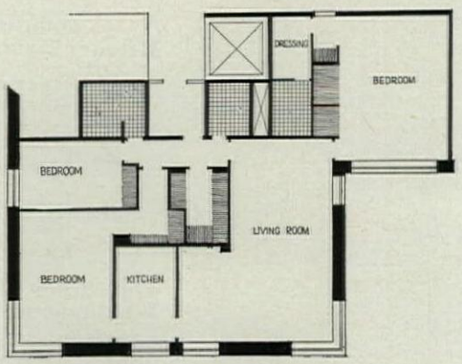
No matter what size the apartment, under the now-defunct Title 608 FHA could commit only $8,100 per living unit. The section was calculated deliberately to spur construction of economy rental housing. So it was only natural that builders in Portland, Ore., planned a flock of Title 608 apartments with minimum floor space. The more units they could cram in per square foot, the bigger the FHA commitment, the less of their own money would be needed.

What the framers of Title 608 did not foresee was happening in Portland last month: tower apartments were being built with temporary partitions, permitting little apartments to be converted into big ones with a minimum of expensive ripping and patching.



With removable partitions, a 3-apt. floor

There were two versions of what motivated the builders. Architect Don Byers, who designed removable partitions, for the 12-story, $2,500,000 Portland Towers,* said candidly it was a gimmick to get a larger mortgage commitment. Milo K. McIver, realtor and builder who arranged financing for the 57-unit, $450,000 Cardinell View, insisted that he only discovered after construction was well under way that pullman-sized apartments were a drug on the market at $75 to $95 a month. "We found that elasticity of apartment size is mandatory if we are to avoid a bankrupting high percentage of vacancies," McIver claimed.



Partitions gone, luxury apartment emerges

For Cardinell View, Architect L. L. Dougan designed a removable wall of standard 2 x 4's with a 2½′ separation, covered with ½″ plasterboard. Gypsum block filled the space between the studs. Sheet metal clips fasten studs to ceiling and floor, which run unbroken above and below the partition. Portland FHA Administrator A. L. Buckner approved the wall as "permanent." So did city building inspectors. But in a typical case, removal of only five partitions would convert three cramped apartments into a spacious 3-bedroom, 3-bath layout (see cuts). It is not a matter of getting more rent. Three $96.50 miniatures combined into a deluxe apartment bring just three

* Whether such walls would be installed was in doubt. Builder Herbert R. Kettell, originally planning to install them, wavered after THE MAGAZINE OF BUILDING began inquiring into the subject. Now, he says he is "undecided."

times $96.50. But in Portland few people will pay $289 a month rent. Some Northwest building experts were predicting the Government would wind up owning some of the towering 608 apartments, anyway. However, mobilization could change all that.

. . . Memphis low cost housing clinic airs gripes at FHA rules

For FHA Commissioner Franklin D. Richards, the NAHB's low rent housing clinic in Memphis early this month proved uncomfortable and embarrassing. Besides the sticky heat, lanky Commissioner Richards was beset by a chorus of complaint from the 300 builders gathered to study how they, too, could put up low-rental projects like the 2,200 units renting from $33 to $50 a month Memphis builders had erected since the last war.

"We could do the same thing," cried builder after builder, "if local FHA officials would take a reasonable attitude toward minimum property and construction requirements." In Memphis, FHA's Ralph Horner had sensibly permitted low rent builders like Wallace Johnson to skip items like the 250 cu. ft. of storage space the agency's rule book demands in addition to closets in a two-bedroom house. There were no individual laundry tubs, often demanded by FHA. And the City of Memphis had paid for much of the utility installation and streets.

At this, Richards conceded "some of FHA's local requirements are a little demanding," invited builders with problems to go over the head of local bureaucrats, bring their problems to Washington. A retort came from the floor: if they did, builders might find they would never get another loan from vindictive local FHA officials.



Among legislators who heard gripes at FHA was Rep. Clinton McKinnon (left), conferring with Builder Fritz Burns and NAHB Chief W. B. Atkinson.

Before the hassel, Richards managed to announce a piece of good news. To make it easier to build low-rent housing, FHA's Section 207 had been re-tooled financially. Field offices already were instructed, said Richards, to ease 207's rent formula so as to permit a 5% reduction of monthly rents. This was done by reducing the initial amortization rate of mortgages from 2½% to 2%, bringing 207 closer to the attractiveness of defunct section 608, which offered a low, 1½% amortization. To make 207 more attractive to lenders, Congress had been asked to revise the payoff rules in cases of default. Lenders now must accept debentures that run 3 years beyond the maturity date of 207's 40-year mortgages. FHA proposal: 20-year debentures.

HAVEN FOR TRUMAN

Into the renovated White House, Builders were fitting an $881,000 A-bomb shelter for President Truman, designed to resist both blast and radiation.

PREFABRICATION . . .

. . . better design, legal attack on codes stressed by institute

Business never looked better to U. S. makers of prefabricated homes. As a fledgling industry, prefabers averaged only 2,000 houses a year from 1935 to 1940. Last year they produced 55,000. That was not only a jump of 60% over 1949 output, but also represented a respectable 5% of the Nation's home construction. This year, prefabers are gearing up to turn out a record 100,000 units.

There would be plenty of customers for everybody, apparently. So executives of 35 prefab firms spoke with refreshing frankness about their plans and problems at the 8th annual meeting of the Prefabricated Home Manufacturers' Institute last month in Louisville's Brown Hotel.

As the two-day session opened, John C. Taylor Jr. of New York, president of American Houses Inc., took office as PHMI president, uncorked this optimistic forecast:

"The change in housing as to size, equipment and style is going to be very dynamic. The only thing I think will be more dynamic is (our) percentage of participation . . . I believe it will increase 40% a year. In 1951 we will do 7% (of total U. S. housing business), in 1952 from 9½ to 10%, in 1953, 14% and in 1954 it will be 20% . . . The conventional builder is on his way out."

Dream houses. On design, Taylor was equally firm: "The trend in architecture is definitely toward the modern, and the use of wood is definitely on the decrease. In the last 5 years, it has gone down about 20% . . . People want . . . a stay-at-home home. The impact of television is greater than you think. The threat of modern warfare is driving more people to rural districts and when they get there they stay home. Congested traffic has something to do with it."



Retiring President James R. Price, Foster Gunnison, New PHMI President John C. Taylor Jr., and P. I. Prentice huddle at prefab meeting.

Said Taylor: The mass market of the future is for a 3 bedroom house of 950 to 1,000 sq. ft., priced from $10,000 down. It must have space to seat six or eight at dinner, a place to sit outside, enough circulation for entertaining 25 to 30 people at a cocktail party, a bath-and-a-half, lots of storage (some in the house and some accessible from outside), and a compact kitchen because "even our wealthiest people are pretty well reconciled to the fact that at some time they will have to take care of that house themselves."

Taylor's design views were seconded by P. I. Prentice, editor and publisher of THE MAGAZINE OF BUILDING, who told delegates: "A great revolution is in process in the way that people want to live and the kind of homes they want to live in. Your future depends on how far you keep ahead of local home builders in designing into your houses the better living and greater comfort and happiness the American home buyer wants."

Battle of codes. One of prefabers' thorniest problems is local building codes that impose senseless restrictions. It was hot news, therefore, when VP William Eagles of Gunnison Homes, Inc., reported that legal efforts to break archaic codes have succeeded in several test cases. Said Eagles: "The purpose of building codes is to safeguard the public health, morals, safety and public welfare of the community. Therefore, we can have set aside any building code if we can prove that the erection of our houses has no substantial relation to the public health, morals, safety and welfare" (see p. 111).

But Eagles warned that conventional builders are starting to demand rigid en-

(Continued on page 25)

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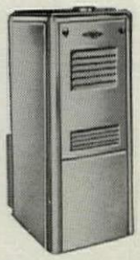

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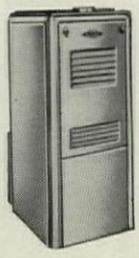

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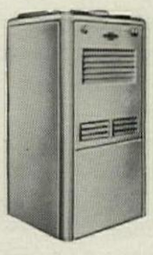
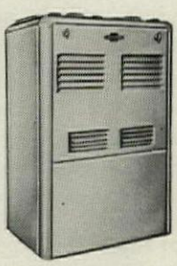
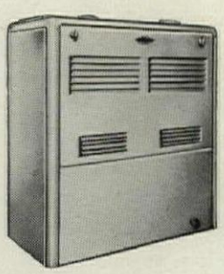


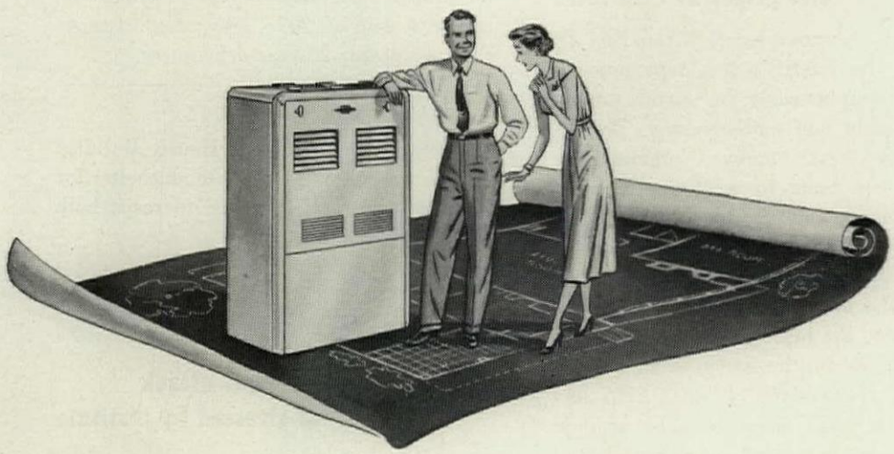
Model GA-120: 120,000 Btu input with all gases. Height 55″; width 28½″; depth 26″.



Model GA-150: 150,000 Btu input with all gases. Height 55″; width 35″; depth 26″.



Model GA-210: 210,000 Btu input with all gases. Height 55″; width 48″; depth 26″.



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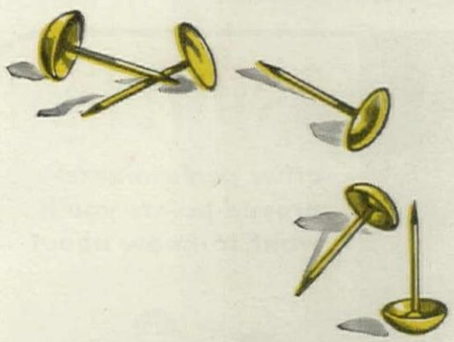
getting down to brass tacks on industrial lighting . . . . . .



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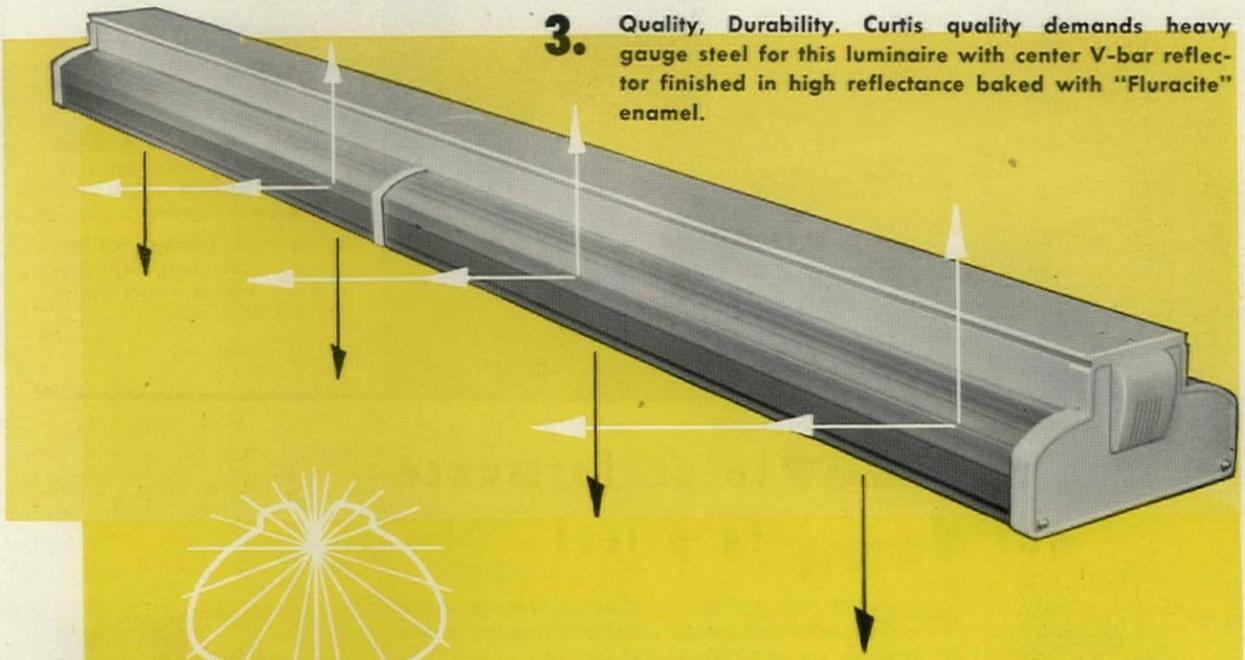

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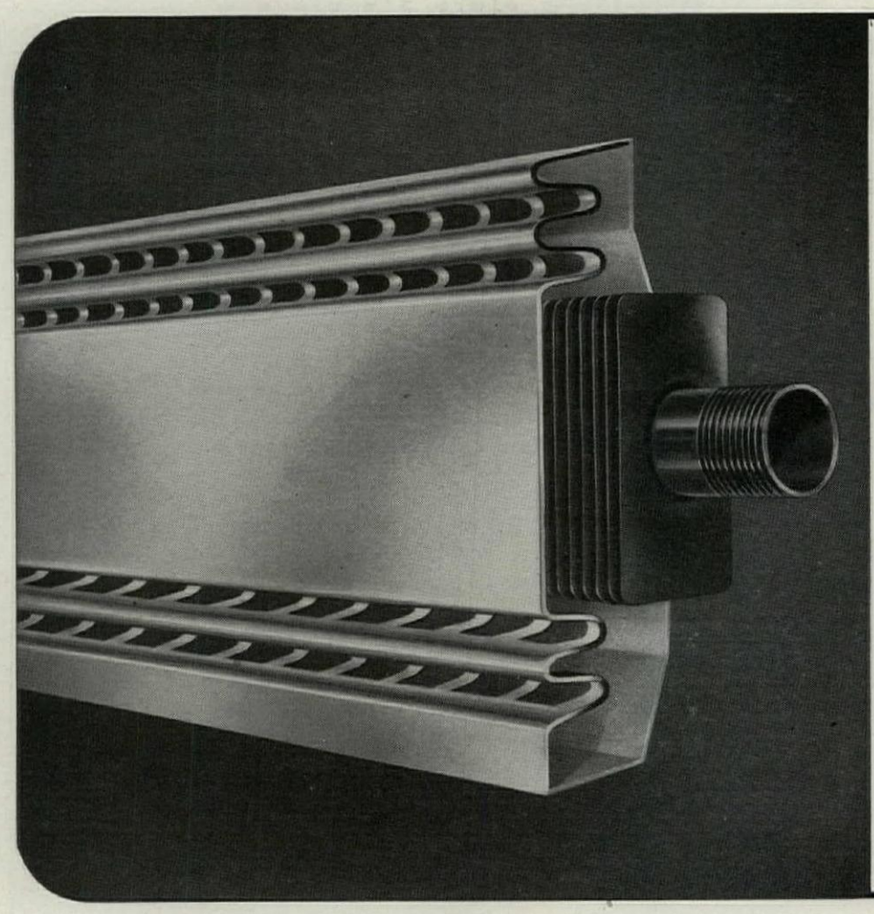

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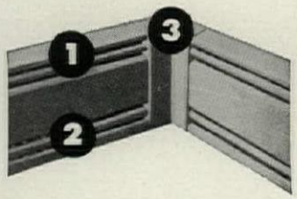

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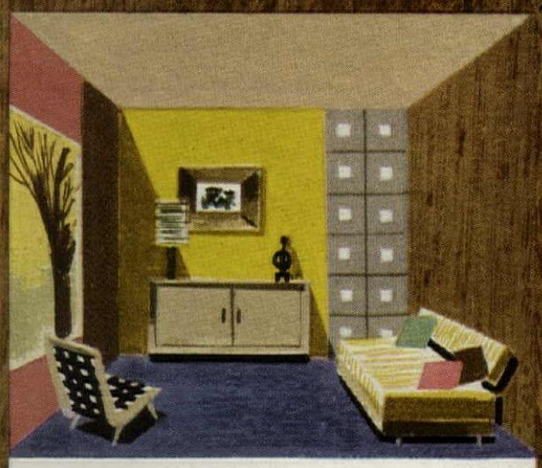

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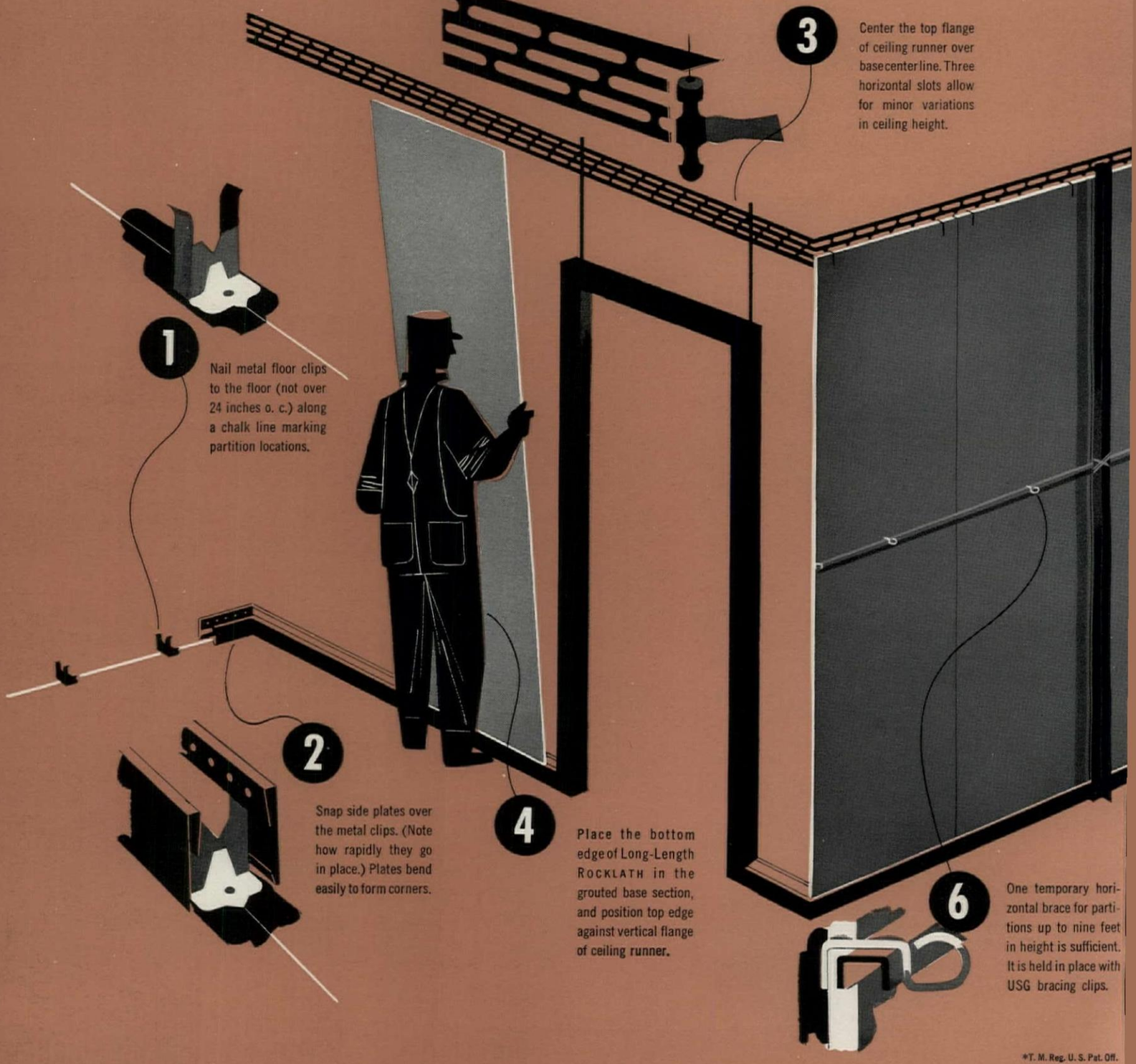
Compared to conventional 5-inch partitions, saves as much as 20 square feet of floor space in a typical apartment—enough for a large walk-in closet.

economical

Space saved is clear profit, for this new partition costs no more, installed, than other partitions of comparable fire resistance. New V-edge Long Length ROCKLATH plaster base goes up *fast,* requires minimum bracing.



1 Nail metal floor clips to the floor (not over 24 inches o. c.) along a chalk line marking partition locations.

2 Snap side plates over the metal clips. (Note how rapidly they go in place.) Plates bend easily to form corners.

3 Center the top flange of ceiling runner over base centerline. Three horizontal slots allow for minor variations in ceiling height.

4 Place the bottom edge of Long-Length ROCKLATH in the grouted base section, and position top edge against vertical flange of ceiling runner.

6 One temporary horizontal brace for partitions up to nine feet in height is sufficient. It is held in place with USG bracing clips.

*T. M. Reg. U. S. Pat. Off.

light weight, strong

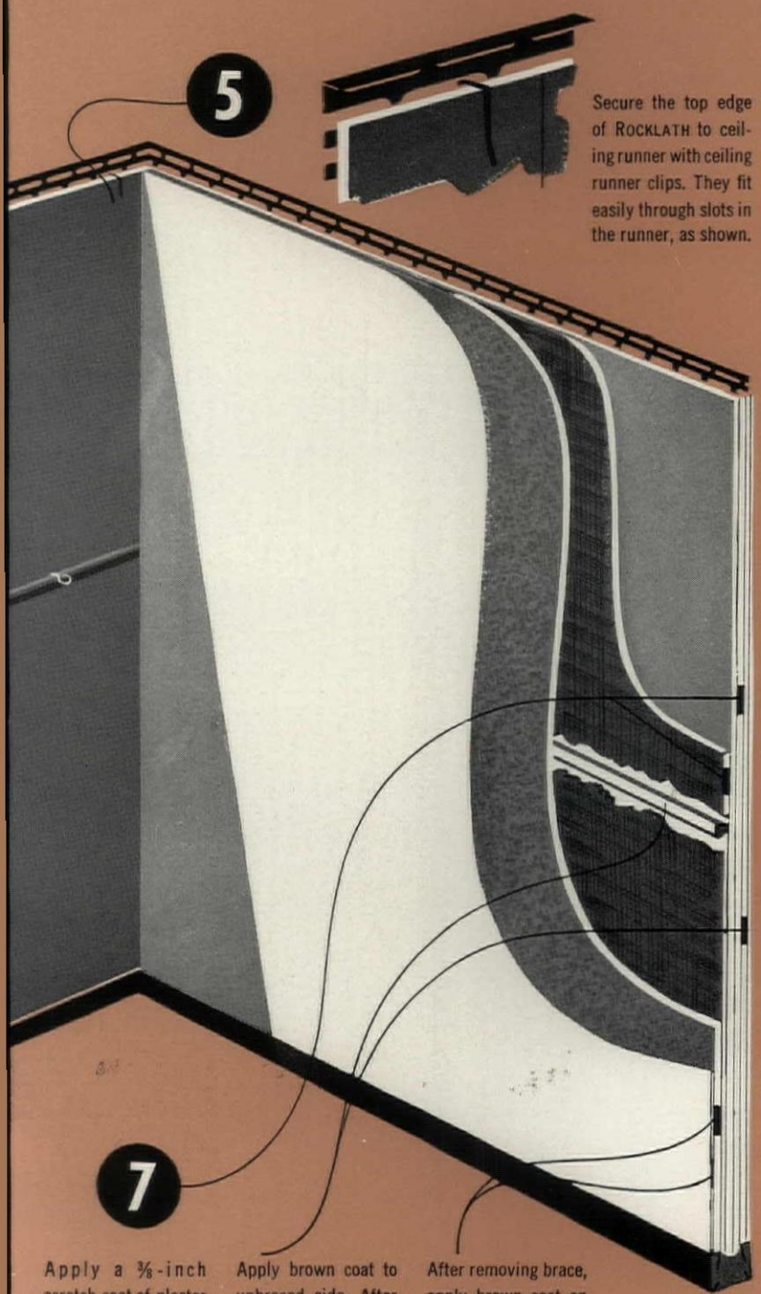
Only 16 pounds per square foot of finished partition—using sand aggregate. Yet it's exceptionally strong. In an exacting impact test, a 60-pound weight, traveling through a 4-foot arc, failed to produce a discernible crack on a full sized partition—*after three successive blows.*

1-hr. fire rating

Tests on 2-inch Solid ROCKLATH and Plaster Partitions plastered with a sand ratio of 1:1 on scratch and 1:2 on brown coat resulted in a one-hour fire endurance rating. The partitions are essentially of gypsum, and will not transmit temperatures much above 212°F. until almost completely calcined.

adaptable to metal or wood base

A wood floor runner can be used if desired.

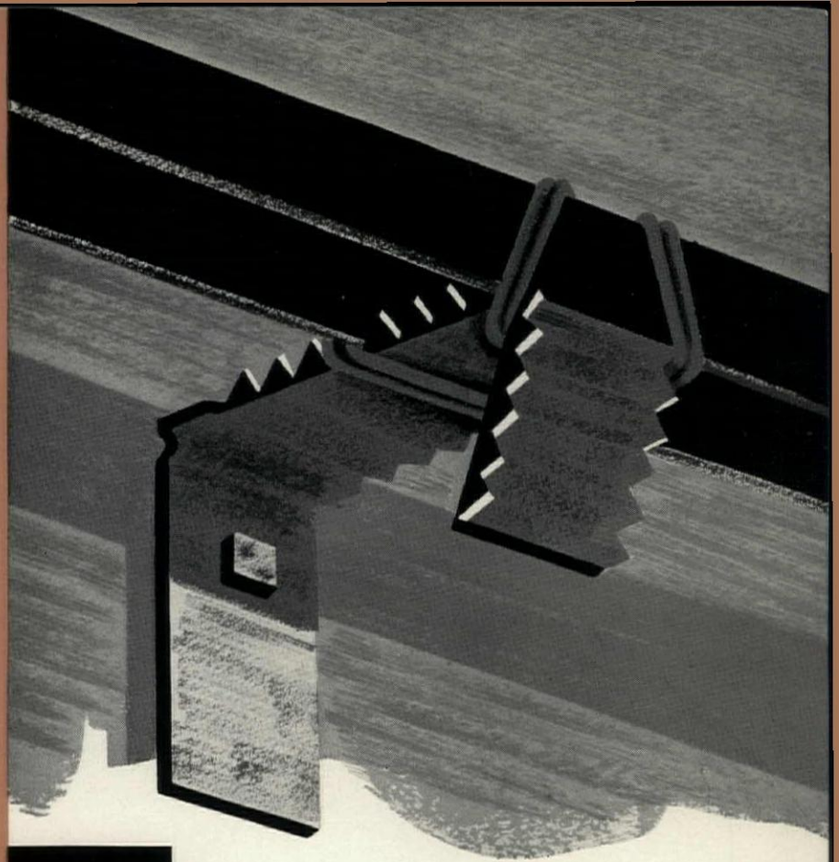


Secure the top edge of ROCKLATH to ceiling runner with ceiling runner clips. They fit easily through slots in the runner, as shown.

Apply a ⅜-inch scratch coat of plaster to each side of the ROCKLATH in first step of plastering. When it is firmly set...

Apply brown coat to unbraced side. After this coat is set, remove horizontal brace, which may be re-used on other partitions.

After removing brace, apply brown coat on brace side of partition. Apply finish plaster over brown coat to complete job.



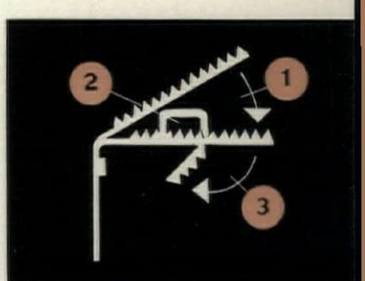
new

furring system

Now it's easier than ever to fur masonry walls for ROCKLATH* or metal Lath. This new USG* Furring System, featuring a simplified furring bracket, is the reason.

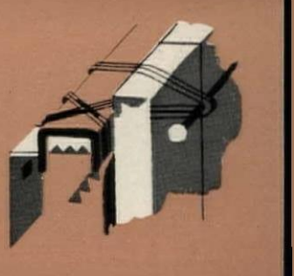
The bracket is adjustable. Its serrated edges hold the metal furring channels rigidly in place at any distance from the wall up to three inches. The bracket secures to masonry walls with only one 2-inch cut nail, or to concrete walls with a single ⅝-inch concrete stub nail. No shims are necessary. See—in diagram at right, described below—how simply it works.

A



A. Channels attach to the brackets in a fast 1-2-3 procedure. Just place channels the desired distance from the wall, wire-tie them to the brackets, then bend extra bracket lengths down and back.

B



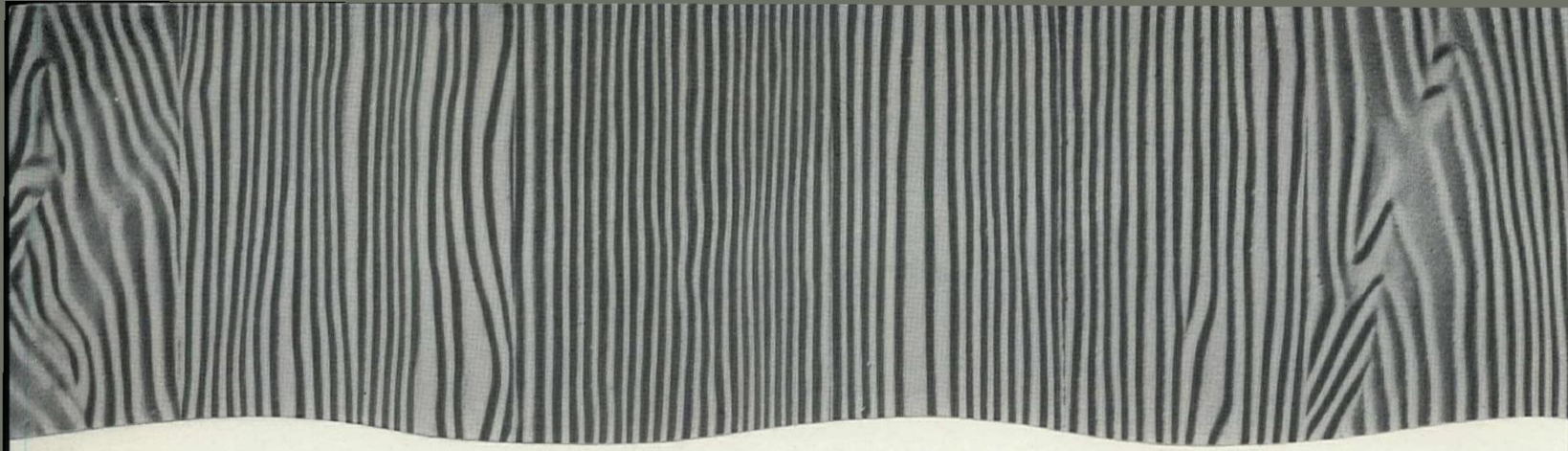
B. Long Length Insulating ROCKLATH attaches to channels with simple 8d nail and wire tie. Attach wire to channel, loop it between edges of ROCKLATH—then place nail in loop, draw the wire tight—and secure it.

C. Apply regular three coat gypsum plaster to a thickness of ¾-inch. For a strong wall that's highly vapor resistant and provides insulating equivalent to ½-inch of fiber insulating board, use Long Length Insulating ROCKLATH, a foiled back plaster base.

C



*T. M. Reg. U. S. Pat. Off.



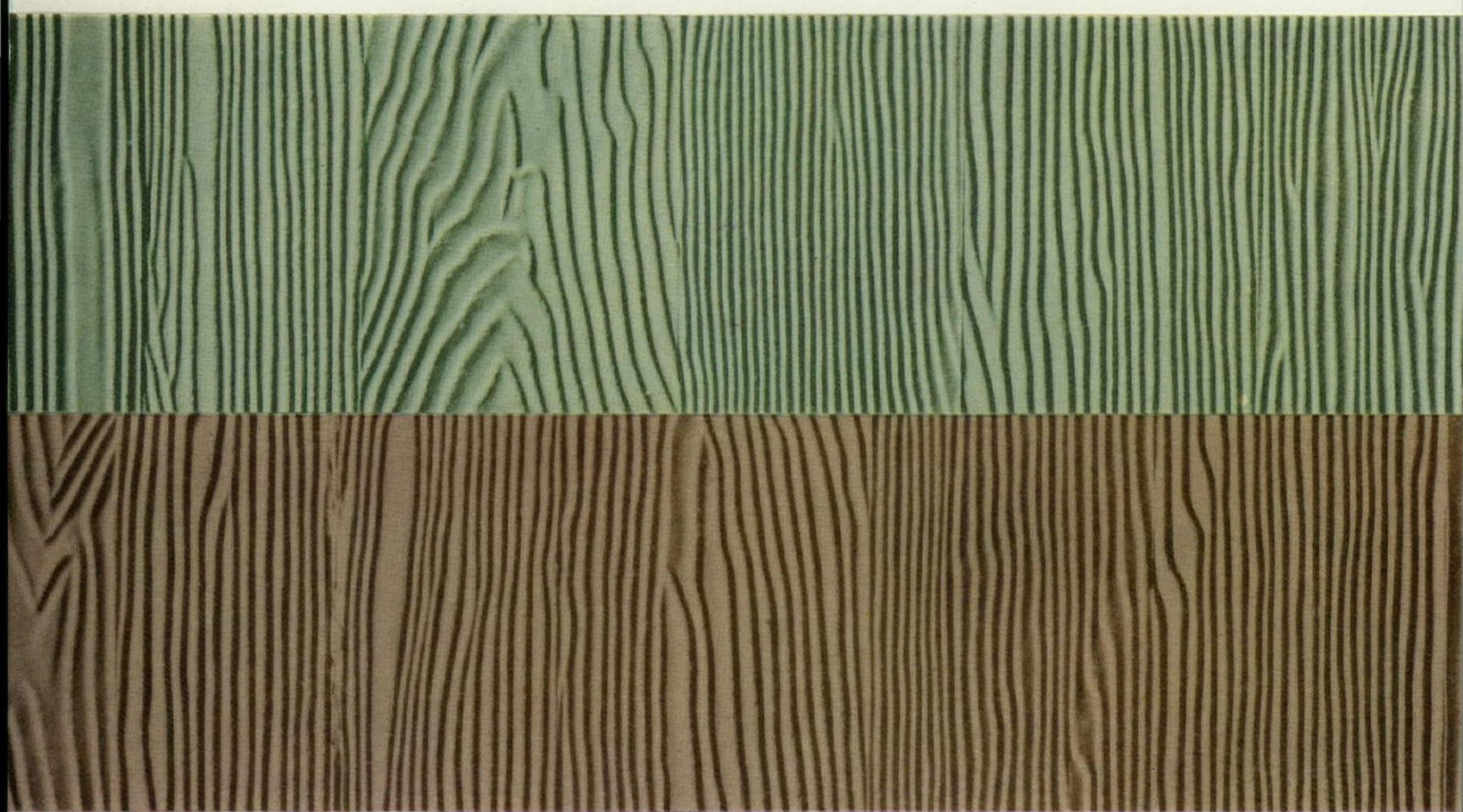
new colored siding

Fireproof GLATEX*, long the aristocrat of asbestos cement siding in Satin White, now comes in Mist Gray, Greentone, and Browntone—colors most asked for by homeowners. An exclusive U.S.G. process bakes the colors on to stay; makes a hard, vitreous-like, easy-to-clean surface that lasts the lifetime of the house.

The beauty of these new GLATEX colors is enhanced by exclusive deep-shadow graining—with 24 different patterns to achieve interesting and varied effects.

GLATEX goes on quickly over new or old buildings. Extra width (27 inches, compared to the usual 24) means fewer joints, tightly sealed walls.

*T. M. Reg. U. S. Pat. Off.





USG UNITED STATES GYPSUM

United States Gypsum

For complete information and specifications on products described in these pages, or on any of the hundreds of USG products for building, consult your U.S.G. Architects' Service Representative. Or write: Architects' Service Department, United States Gypsum Company, 300 West Adams St., Chicago 6.

*T. M. Reg. U. S. Pat. Off.

forcement of codes in the many cities where prefab houses are now going up in "technical violation." In Iowa, for instance, a state law requires 8′ 3″ ceilings. Since 1945, he said, no one has enforced it and Iowans have bought hundreds of prefab homes with 8′ ceilings. Now, "with the Iowa conventional builder being pinched for materials . . . he is fighting back by clamoring for strict enforcement of the State Building Code." Near Pittsburgh, one town has adopted an ordinance banning prefabricated wall sections, even though the house meets local code standards.

WASTE . . .

. . . HHFA asks for advice on how to cut building waste, then bobbles it

Ray Foley's Housing & Home Finance Agency, which occupies a key spot in Washington to get something important done now to reduce waste in building, crawled gingerly aboard the bandwagon last month.

Following the pattern already indicated by The Magazine of Building's two Round Tables, HHFA convened a panel of 18 architects, engineers, builders, materials men, association leaders and researchers (7 of the 20 had been members of the Round Table). The 20 were designated "The HHFA Advisory Committee on Resource Conservation in Dwelling Construction."

In calling the two-day session, Foley promised participants a broad, impressive four-point agenda:

1) Where can the greatest savings be made in materials, manpower and transportation needed to build homes? What substitute materials are available? 2) What research is needed to develop "practical conservation methods which do not reduce quality below acceptable standards?" 3) What do committeemen think of proposed emergency housing standards for various levels of scarce materials and manpower? 4) How can anti-waste standards be put into effect in local building codes, lender policies and labor and industry practices?

But the meeting was only a few minutes old when it became clear that Foley's aides were preoccupied with a single idea.

"We asked you to come down here," said HHFA Research Chief Richard U. Ratcliff, presiding, "because we have $1 million to spend for research. We want your advice on how to spend it."

Builder Earl W. Smith of Berkeley (Calif.) gave him a short answer. Said Smith: "You've already got most of the research you need. This is a time for action, not inquiries."

Mountain and mouse. From this contentious start, the panel ranged over a broad list of ideas, most of which had already been developed by the Round Table. HHFA however, made public little but the mouse-sized fraction of its experts' advice which fitted Ratcliff's notions on research. In a 900-word press release that took two weeks to hatch, the agency cackled in federalese:

"The advisory committee . . . has recommended that the HHFA undertake research in several new fields, extend existing research in others, pursue its plans to assemble and make available to the industry results of research already completed."

Actually the research was the third and least of the committee's recommendations. The more insistent recommendations 1) publish in booklet form presently available ways to eliminate waste, and 2) attack obstructive codes, were buried in gobbledygook. Only specific waste-saving suggestions HHFA saw fit to divulge were its panel's endorsement of the new National Plumbing and National Electric Codes.

What really happened. If the HHFA was trying to suppress the recommendations of its own experts, it was a feckless effort. Panel members themselves, interviewed by long-distance telephone, were all more than ready to talk. Items revealed:

New dimension—To save 25% of the lumber going into house framing, reduce the width of 2 x 4, 2 x 6, 2 x 8, 2 x 10 and 2 x 12 studs and joists to 1½″, and leave the 1½″ width rough-sawn. Since the nominal 2″ dimension of 2 x 4 lumber is actually trimmed to 1⅝″ by smooth finishing, this would mean at most only a 10% drop in structural strength—an insignificant factor because studs and joists are already far stronger than necessary and because the major stress on framing lumber is borne by the 4″ dimension, which is actually only 3⅝″ after smooth finishing. (Several panel members criticized the 2 x 3 stud recommended by the Round Table. They said it would produce walls too thin to hold plumbing stacks, hot air ducts and electric outlet boxes.) Would dealers and carpenters agree to handle the rough-sawn pieces? Panel member Fred Ludwig, ex-president of the National Retail Lumber Dealers, believed they would. In Philadelphia, rough-sawn framing timber has been standard for years, he pointed out.

Labor Support—Without it, adoption of waste-cutting practices is hopelessly stymied. (In Chicago, one panel member mentioned, unions insist on wiring in conduits though Romex or tube and knob wiring is permitted by local codes.) Let HHFA form a panel of building labor leaders, hand them the same problem—how to cut down on the use of scarce materials—in expectation that the resulting suggestions would be much the same.

Longer Lengths—Panel member Clark Heritage indicated his Weyerhaeuser Timber Co. would study whether to produce 7′ 8″ studs and 12′ 8″ joists which builders said would fit into most homes with no waste at all. He shied away from making any definite commitment, leaving other committeemen with the impression Weyerhaeuser would begin cutting such lengths if it got a big enough order. (Later, in Tacoma, Heritage said the firm was actively "appraising the market" for the 7′ 8″ lengths, which have been endorsed by AIA and NAHB.)

Federal acceptance? The second day's session opened with a strong demand that FHA set its own house in order, bring the property qualifications of its own 72 offices in line with waste-elimination standards. (In many cities architects and builders say FHA standards are more wasteful than the codes.) Three weeks after the session C. O. Christenson, Chief of FHA's property requirements section said: "We certainly would be better able to take action after the report of it is prepared. But to a great extent we are taking such steps month by month . . . We've O.K.'d the National Electric Code. We will approve the new plumbing code when it is ready for distribution." On the 1½″ stud and joist dimension: "If Forest Products Laboratory amends, we'll amend."

As Panel member Ty Rogers saw it, "the net value of the meeting depends on what HHFA does with it." On the record so far, that was disappointingly little.

. . . construction watchers get a break from Dallas bank

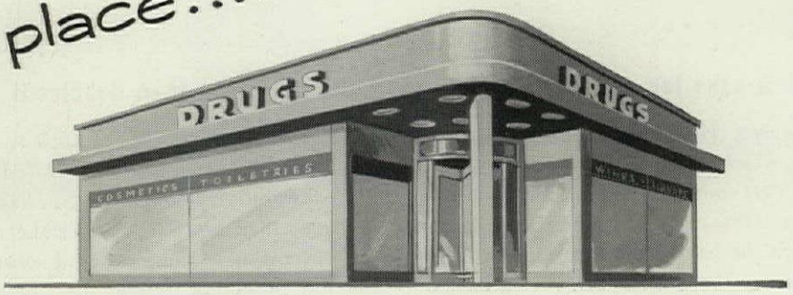
In Dallas, where banks scramble for business like cut-price drug stores in other towns, Republic National Bank spread the ultimate in welcome mats for sidewalk superintendents at its 36-story office building. Overlooking the excavation, the bank built a yellow-canopied pavilion, equipped with fulltime male host, soft-drink machines, benches and red cushions. The stunt drew 3,000 kibitzers in four days. The bank hopes it will also draw accounts.

(NEWS continued on page 28)



same place...new face

and everybody's happy!



Masonite Hardboards do wonders in commercial remodeling!

There's more satisfaction per square foot when you remodel a store, office, theater or other establishment with Masonite Hardboards.





The designer is happy because these durable, tough, all-wood panels are so versatile! He can use them on walls, ceilings, partitions, counter fronts, fixtures, displays and in dozens of other ways . . . even as all-weather exteriors.



The builder is happy because Masonite Hardboards are easy to handle and easy to work. No special skills or tools needed. They go up fast, take wonderful finishes and are readily bent to modern, graceful curves.



The owner is happy because his "old-new" store gets up-to-date results at low cost. Traffic is attracted, sales boom and his investment pays off.



The customer is happy because she would rather shop in a clean, smart-looking store that has modern displays and easy-to-find merchandise.

Your lumber dealer will be happy to tell you more about Masonite Hardboards and how you can make them earn money for you!

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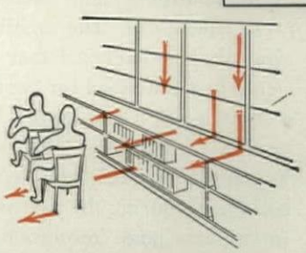
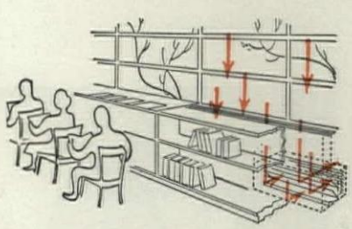
TRADE MARK



USED TO BE *drafts and chill air were part of ventilation. Above you see the usual air flow as it sweeps dangerously over pupils.*



NOW YOU SEE *how* DRAFT | STOP *prevents drafts and cold rushes of air before they start. No school can be called "modern" unless the* DRAFT | STOP *System is in service.*

IN TOO MANY schoolrooms, the desk row by the windows is dangerous. Draft Row condemns pupils to discomfort, inattention, often illness. This problem, created by today's large window area, has been solved. The new Herman Nelson DRAFT | STOP System stops drafts!

Automatically controlled temperatures and a fundamental improvement in modern heating and ventilating make DRAFT | STOP the system that is definitely different, absolutely unmatched in performance. Send now for booklet explaining DRAFT | STOP in detail. Write Dept. B-5.

AAF

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PLANTS IN MOLINE, ILLINOIS AND LOUISVILLE, KENTUCKY

AIA CONVENTION, in lively Chicago sessions, stands up for building industry against its bludgeoning



Photos: Arthur Shay

President Glenn Stanton

Associates of new AIA President Glenn Stanton expect him to be a president more like former president Douglas Orr, whose responsibility and social vision Stanton admires, than like retiring president Ralph Walker, whose "dynamic activism" he does not consider in his own style.

As an architect, Stanton has developed no flaming convictions on design, believes "the revolution is over," thinks of himself as a common-sense modernist. His strong convictions are on the subject of the architect's responsibility for a good job: "building must work." In his own office, favorite pictures are of Paris. Stanton is an extensive worker on public service enterprises, is actively interested in city planning and urban redevelopment. With associates Rollin Boles, Keith Maguire, and Kingsley D. Church he conducts a solid practice strong in churches and schools but also including major commercial and industrial buildings.

Tall, lanky, white-thatched Glenn Stanton was born 56 years ago on an Iowa farm near Humbolt, did his first building as a farm boy. A bachelor, he lives neat-as-a-pin in a typical, weathered cedar, clapboard suburban house in Portland, Ore., designed by English-trained Wade Pipes who was Stanton's critic when the young student went through architectural school with the first graduating class at the University of Portland. Stanton also studied at M.I.T. and in Europe.

This month more than 2,000 of the 9,000 architects in the AIA met in Chicago for the most serious, yet the gayest, convention in their history. In a degree hitherto unprecedented the architects identified their interests—and their worries—with those of their industry.

Worry 1: The industry was being asked by Government to carry the lion's share of defense sacrifice for the whole country. Said Retiring President Ralph Walker, "No other industry has been subjected to such a riot of decrees, regulations and confusion. We are willing to do our share and more, but we do not like to carry the effort and the sacrifice alone." Moreover, building industry recommendations were being ignored. Waiting not one minute, Walker secured approval the first day in open meeting of resolutions aimed to get "some clear pattern of economy" and some orderly procedure out of Government agencies.

Worry 2: Civil Defense. The Government was strongly censured for not releasing known information and data for the design of shelters and other protective construction. And architects demanded that Congress stop passing the buck to cities and regions, make adequate Federal appropriations for such shelter.

Worry 3: In target areas where no defense work was being scheduled, building was drying up under Government regulations; building and architectural offices were closing up. The architects asked that controls be so relaxed that at least a staff could be maintained for "economic health."

Worries 4, 5 and more: What was happening in housing. The joint committee appointed by AIA and NAHB had done solid work during the past year. It brought in reports and resolutions condemning severely HHFA for distorted reporting of advice given by industry leaders at

(Continued on page 32)

Officer Candidates: Tom Fitz Patrick, Ames, Iowa (who lost to Leonard Bailey in race for Central States Directorship); Howell Lewis Shay, Sr., Philadelphia, defeated for 2nd vice president by Norman J. Schlossman, Chicago; G. Thomas Harmon III, Columbia, S. C., South Atlantic States director.



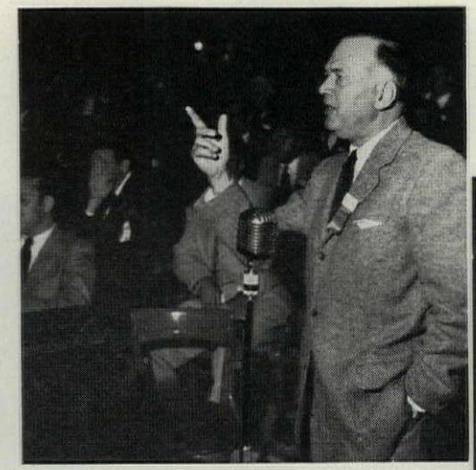


Resting: Kenneth Wischmeyer, St. Louis, first vice president; Charles Matcham, Los Angeles, Sierra Nevada regional director.

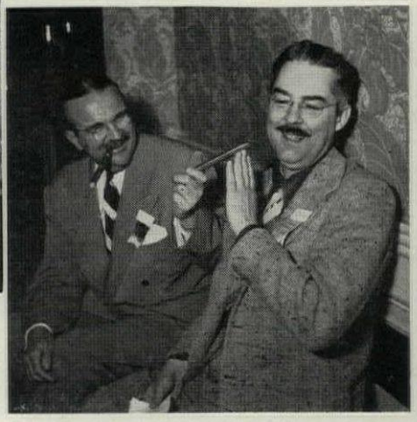
by government, elects Stanton president



Retiring President Ralph Walker, New York City, audits a lecture on the architect's place in the modern world.



Dean William W. Wurster of University of California's School of Architecture gives illustrated talk on work of Gold Medal Winner Maybeck.



Morgan Yost (right), president of Chicago chapter and convention host, refuses a cigar, offered by Temple Buell, Denver.



At the feet of three masters: Minnesota architecture students gather in The Magazine of Building's *suite for bull session with Richard Neutra (Arichtectural Editor Douglas Haskell), Ludwig Mies van der Rohe and Pietro Belluschi.*

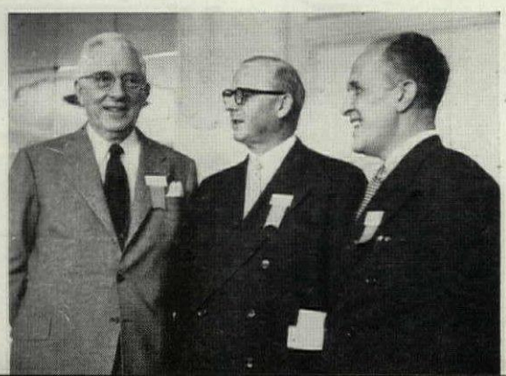


Chloethiel Smith, The Magazine of Building *representative, holds court with Philip Will, Jr., Chicago; Morris Ketchum, New York; Robert M. Little, Miami Beach.*



Executive Secretary Edmund Purves; Samuel Homsey, Wilmington, Del.; Donald Beach Kirby, San Francisco; Secretary W. Walter Hook, Charlotte, N. C.; and Daniel Schwartzman, New York.

Treasurer Maurice J. Sullivan, Houston, enjoys a smile with Edward L. Wilson, AIA's Texas director, and new AIA secretary Clair W. Ditchy, Detroit.





John Highland, Jr., Buffalo, at exhibit of prize-winning designs in lobby of Edgewater Beach Hotel.

(Advertisement)

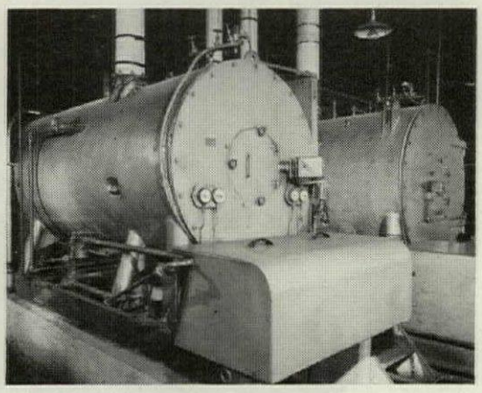
Steam Generators Pay for Selves and Save $10,000 in First Year

Operating Costs Reduced Sixty-Six % With Lower Fuel Cost & Maintenance

Many railroads have effected huge savings by replacing old inefficient boilers with modern packaged automatic steam generators. Mr. O. T. Carroll, Chief Engineer of Peoria & Pekin Union Railway Co., Peoria, Ill., purchased for his company two modern packaged steam generators; a 75 h.p. for stand-by and a 150 h.p. "on-the-line", and reports his savings as follows:

"The operation of the two York-Shipley Steam-Pak Generators installed in our roundhouse to furnish steam for heating the roundhouse and offices is beyond our expectations as to expense and efficiency.

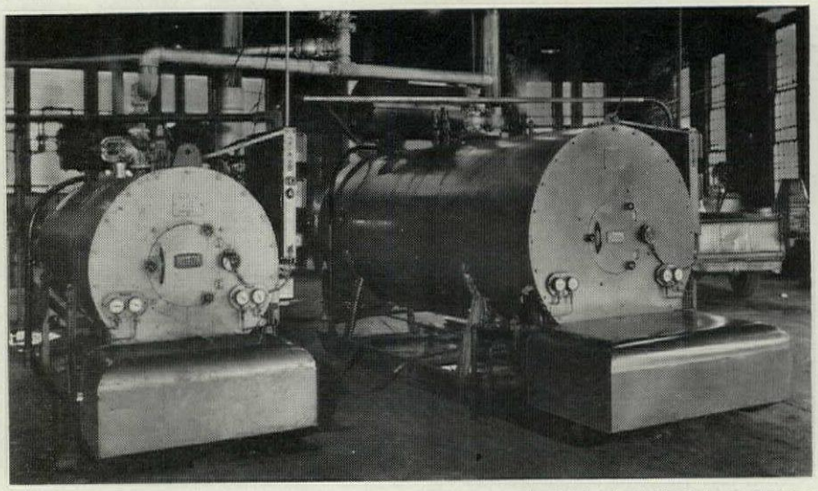
The savings effected in changing from the operation of the old coal-fired boiler will pay for the cost of installation and the first year's operation."



The total investment for these two new generators, fired with low cost Bunker C heavy fuel oil, was approximately $35,000.00. Cost of fuel and maintenance annually was reduced to approximately $8,000.00—a 66% reduction, based on the average operating cost of the old plant of $53,000.00 per year.

Maintenance cost old boiler	$53,000
Cost of new equipment	35,000
Operating cost new equipment	8,000
Total cost first year	$43,000
First year's savings	$10,000
Estimated 2nd year savings	$45,000

These modern Steam-Pak Generators, manufactured by York-Shipley, Inc., York, Pa., are showing similar savings in hundreds of installations all over the country.



Multiple installation at Monon Railroad, Indianapolis, saves $1,000.00 per month in fuel and labor.

STEAM-PAK YORK 45 POWER GENERATOR
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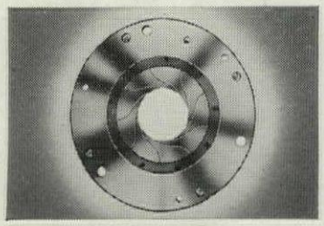
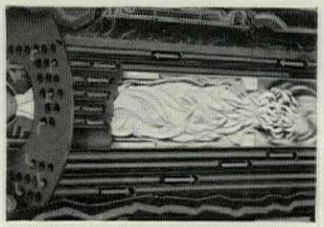
They're Built For Maximum Efficiencies In Operation . . .

- Engineering design recognized by top engineers and architects.
- Satisfactory operation in thousands of buildings all over the country.
- Tremendous savings proven by hundreds of case histories.
- Distributors chosen for their engineering ability, trained to provide the best engineering "know-how."

These are four basic reasons why Steam-Pak should be No. 1 on your list of steam generators.
See your nearest York-Power Distributor or write York-Shipley for complete details.



IRIS SHUTTER
Patent protected feature provides precision control of burner air, accurately synchronizing air-oil adjustment.



NEW FIRE CONTROL
Swirling flame action speeds gas flow, increasing heat absorption and combustion efficiencies.

Steam-Pak Generators — from 15 h.p. up, for low or high pressure steam or hot water, for light or heavy oil, combination gas and oil or straight gas.

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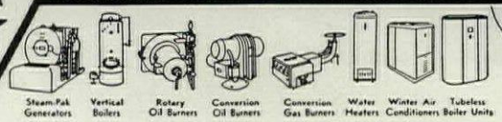



WHICH?



It's difficult to think of a slender match in the same class with a Block Buster, yet both can be equally destructive.

When a plant, hotel, school or store is burned out by a carelessly thrown match, it is just as much a casualty as though it were bombed. Today such fires, at best, mean delayed replacement due to material shortages . . . at worst, a serious loss of life. *Yet they can be prevented!*

Authorities agree that the way to control fire, to hold losses to a minimum, to protect lives, is an automatic sprinkler system. Grinnell Automatic Sprinkler Systems check fire at its source, wherever and whenever it strikes, with automatic certainty.



SEE THAT GRINNELL SPRINKLER HEADS ARE ON GUARD

In factories, as well as in schools, hospitals, theaters and hotels, there is a moral obligation upon architects and management to provide the utmost in protection of life and property. For your own sake, be sure the hotels, hospitals, the plants, and the schools for which you are responsible are protected with Grinnell automatic sprinkler heads — your assurance of positive, automatic fire protection.

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GRINNELL

FIRE PROTECTION SYSTEMS

NEWS

HHFAdministrator Foley's recent conference (see p. 25).

FHA and VA also came in for admonition. After a year of work together, architects and builders had discovered that the greatest block to house quality lay in refusal of appraisers to recognize the cash value of superior design. Said committee member Albert Balch, the builder co-chairman, "The difference between a good house depreciating 2% a year and a poor one depreciating 4% means 100% difference in value to the owner. How wise to have spent a few per cent more before starting." Yet appraisers for both FHA and VA are prepared to allow only something like $35 per house for design—less than the cost of a bathtub.

Going yet further in their aggressive campaign, the collaboration committee offered a resolution, passed by the convention, asking that appraisals recognize the value of livability in "factors of privacy, flexibility, logical arrangement, durability, easy maintenance," instead of recognizing only square feet and construction specifications.

The effect of all this was to make it possible for builders to avail themselves of architects' skill instead of being *actively penalized by FHA and VA for employing architects and improving quality.*

Said AIA vice president Kenneth Wischmeyer, "In our builder collaboration we have at last put ourselves on the high road to better design for homes of Americans." And many an architect questioned in the corridors put down the builder collaboration as one of the finest achievements of President Walker's dynamic administration.

Convention side shows:

- Al Shaw's jingles, at the Chicago Chapter's skits which convulsed the cabaret dinner crowd at the lush Edgewater Hotel. Sample:

  I'm as immoral as Wren and Bramante;
  How I long for flowing volutes.
  What would I pay for a renaissance bay
  Or for columns with bases and flutes,

  sung by an ITT student about to buy a "dirty postcard" showing these treasures.
- The Producer's Council talk by Charles Luckman, who pointed out that the architect has a duty to keep owners advised promptly and progressively of cost changes.
- The exhibition of new products.
- The architects' own exhibitions drew well-deserved merit awards in industrial and hospital classes: The Coca Cola plant at Houston by Stone & Pitts and the Clearwater County Memorial Hospital at Bagley, Minn., by Long & Thorshov. But the house jury, though confronted with more than one house already internationally famous, gave no merit award.

PEOPLE ...

To its famed native son **Ludwig Mies van der Rohe,** Western Germany's Institute of Technology *Fridericiana* at Karlsruhe last month sent an honorary degree of Doctor of Engineering. The presentation was made in Chicago, Mies' hometown since 1938, whose skyline he has dramatically changed in 13 short years. Presenting the degree to his colleague at a dinner attended by friends of Mies' from as far as New York and California, Illinois Tech's Konrad Wachsmann quoted an accompanying message from Karlsruhe: "German academic youth will make your development its model. . . . (they) deeply regret that you can only be their master from afar."

Jordon Joel Bernstein



Pietro Belluschi solved the problem of what to do with his big architectural practice in Portland, Ore., now that he is dean of MIT's School of Architecture in Cambridge, Mass. He teamed up with far-flung Skidmore, Owings & Merrill to carry out such jobs as the Federal Reserve Bank of Portland, Portland Telephone Exchange Building. The hybrid firm was titled Belluschi & Skidmore, Owings & Merrill, Associated.

"Good-looking, utilitarian housekeeping machinery," announced Industrial Designer **Henry Dreyfuss,** has spearheaded an "amazing rise in the level of public good taste during the past two decades." That "gadget-conscious mammal," the American housewife, has acquired a "marked distaste for fringed lampshades and dropsical sofas," Dreyfuss told a symposium at New York State University. He added: "There is more bad taste, in the form of ugly furniture and hideous decoration, to be found today in homes in the great artistic and cultural centers of Europe than in the homes of Pittsburgh and Detroit."

Aubrey M. Costa, president of Southern Trust & Mortgage Co. of Dallas, was nominated as president of Mortgage Bankers Association for 1951-52. **Brown L. Whatley,** president of Stockton, Whatley, Davin & Co. of Jacksonville, Fla., was nominated vice-president. Both selections are tantamount to election, to be held during the MBA convention Sept. 11-14 in San Francisco.

Lecturing at Yale, New York Realtor **William Zeckendorf,** who assembled the site for the United Nations, took a lusty verbal swipe at conservative financiers for underwriting too many speculative buildings that "look awful and last for a very short time." Said Zeckendorf: "Look . . . at the trustees. They are interested in keeping themselves free from criticism much more than in making great progress. And the paid executives, if they make mistakes, are fired not for lending 95% instead of ⅔ on conventional buildings, but for lending 50% on unconventional buildings."

Leonard G. Haeger, 44, who incurred the wrath of his boss, HHFA Research Chief Richard U. Ratcliff by serving as technical aide to THE MAGAZINE OF BUILDING's Round Table on *Waste in Home Building,* quit HHFA to become housing materials expediter for the National Association of Home Builders.



Harold Hauf, editor of Architectural Record since August '49, was yanked back to active duty May 1 as a Navy commander. His assignment: correlator of design and construction at Boston.

PRICES ...

... fir drops in the Northwest but dealers think it's temporary

For the first time in months, lumber prices dipped in the Pacific Northwest, source of more than a quarter of the country's building wood. In Portland, Ore., green 2 x 4″ fir dimension lumber was being quoted at $73 to $76 by wholesalers who were quoting a top of $83 only a fortnight before. Experts thought the price might slide another $5 before it touched bottom. Lumbermen blamed the dip on reduced demand, record production, bad weather in consuming areas, and a temporary surfeit of freight cars.

Few thought the price break would last. Prices of top grade lumber remained unchanged, a big squeeze on freight cars loomed, and there would be a 40% shortage of ship bottoms for intercoastal trade. Among other building materials, prices were on a plateau. For this, BLS gave chief credit to the price freeze.





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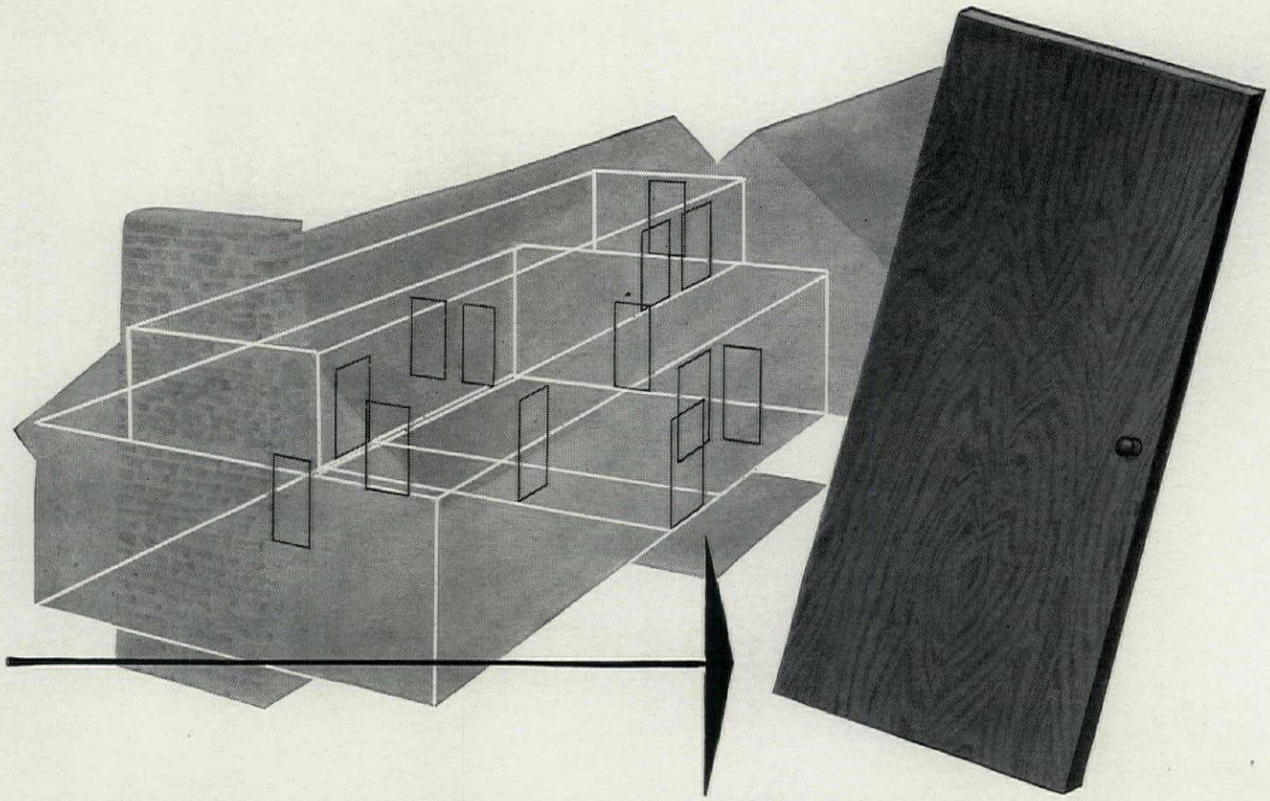

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Model home, Green Acres development, Valley Stream, Long Island

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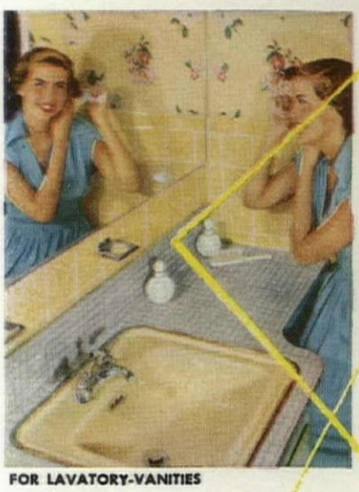

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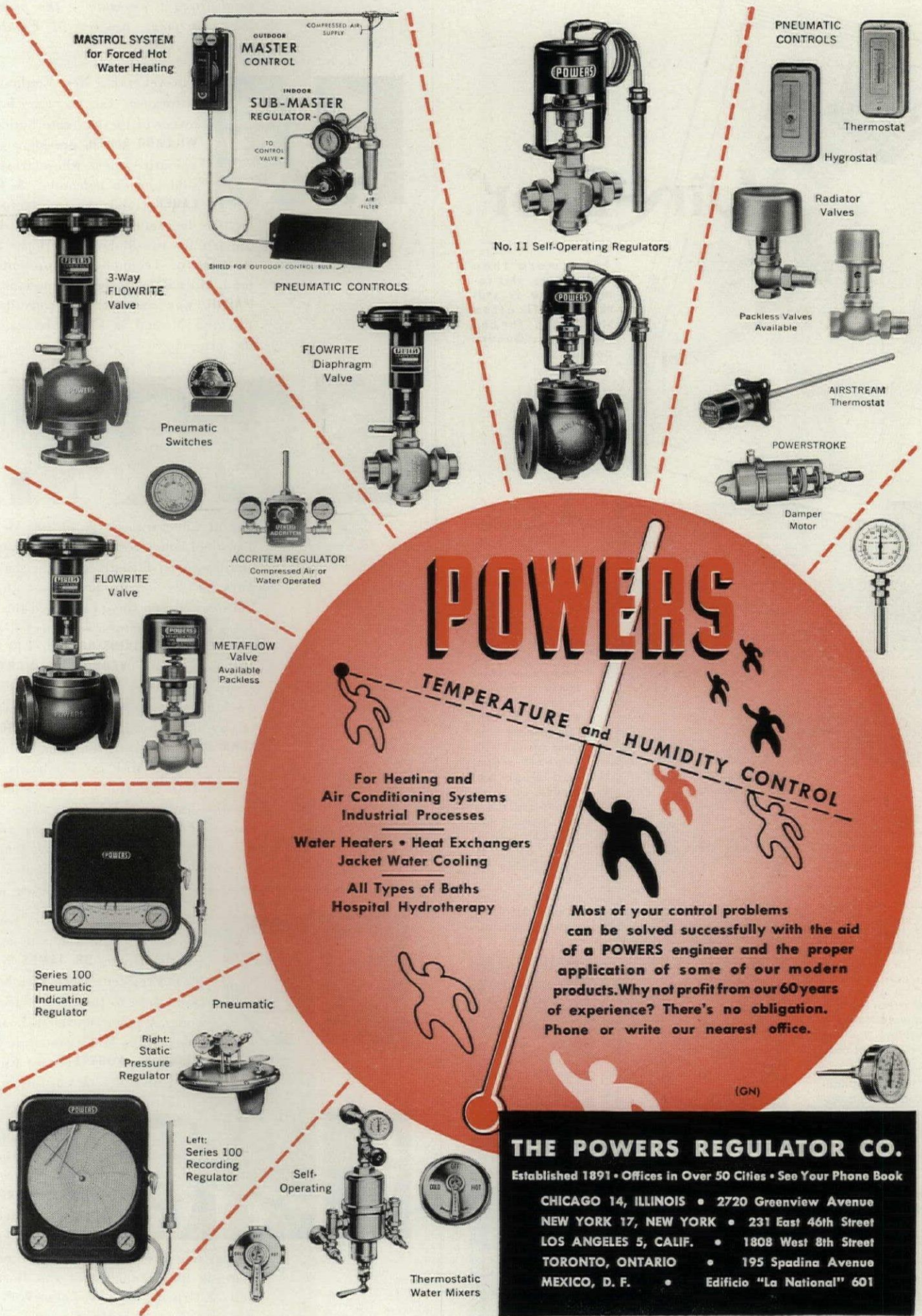
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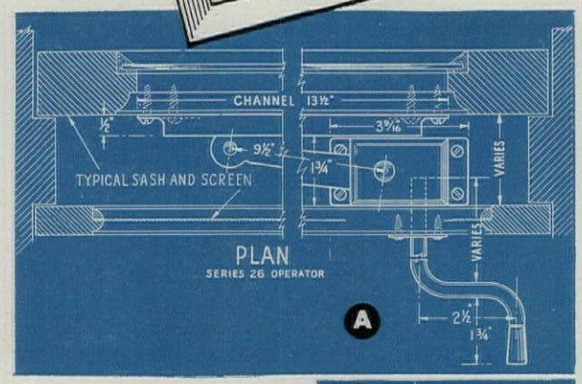
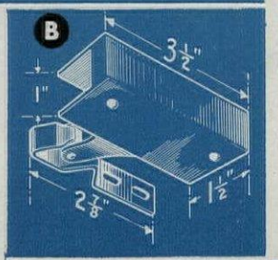


A Win-Dor Casement Window Operators for outswung wood casement sash have no equal. They make any wood casement window the most convenient and modern window there is. There is merit in the exclusive Win-Dor design and construction with bronze worm and bushing. There is long wear, and there is always user satisfaction. Shown at left is typical plan of Series 26 installation. See Sweet's for complete details and other types.



B Here is the large size No. 45 Win-Dor Snugger, the automatic top-closer that reaches out and pulls sash shut.

C Medium-sized Snugger does the same job on light sash and is the choice of thousands of architects for cupboard and closet door closing.

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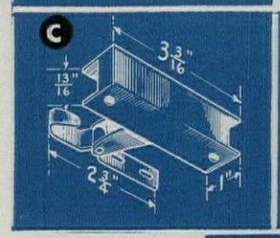

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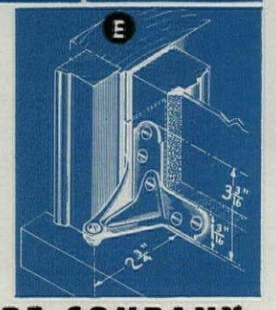

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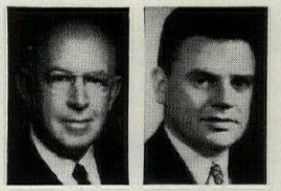
BEHIND THE BLUEPRINTS

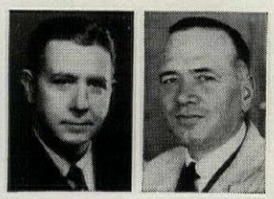
These are the creators and owners of 100 Memorial Drive ("Eastgate"), the precedent-shattering apartment project in Cambridge, Mass. (p. 114):



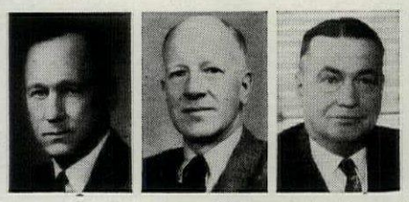
The venerable New England Mutual Life Insurance Co. is the forward-looking owner of the Eastgate buildings. **GEORGE WILLARD SMITH,** president (l.) is the imaginative client whose travels in Sweden sold him on balconies. **A. OSBORNE WILLAUER** (r.) is the architectural consultant for the insurance company. He discovered the opportunity to collaborate with the Massachusetts Institute of Technology, represented New England Mutual in design discussions. **CHARLES N. MARCH** was management consultant for New England Mutual in the early stages, now runs the project.



The architectural design of 100 Memorial Drive, a project conceived primarily to house MIT staff families, was, fittingly enough, the collaborative work of five of its professors of architecture. Liaison between the quintet and the owners, engineers and contractors was effected by one of the five, **WILLIAM HOSKINS BROWN,** MIT faculty member since 1940. **VERNON DE MARS** is the only group member no longer with MIT. He is now teaching and practicing architecture at the University of California at Berkeley. **ROBERT WOODS KENNEDY** is a native Bostonian, a Harvard-trained architect, with MIT for five years. **CARL KOCH,** another Harvard alumnus, has a busy diversified practise radiating from his office in suburban Boston. **RALPH RAPSON** is a veteran competition winner (9 prizes), a private residential architect, a store owner (he sells modern furniture) and assistant professor of architecture at MIT.



MIT leased the land on which Eastgate is built, a magnificent site overlooking the Charles River. **DR. JAMES R. KILLIAN, JR.,** MIT President since October, 1948, has been close to the project from the beginning. A prime mover in Eastgate's development was MIT's erstwhile Architectural Dean **WILLIAM W. WURSTER,** now filling the same post at the University of California at Berkeley.



Engineering, architectural consultation and supervision of construction was by Thomas Worcester, Inc., **THOMAS WORCESTER,** (l.) president. **WILLIAM DAVIES** (c.), architect member of Worcester's firm during the project's development, is now manager of the Boston office of Kelly & Gruzen. Vice-President **D. P. APPELL** (r.) of the George A. Fuller Co. gave useful advice; Vice-President **T. S. PAULSEN** was in charge of Eastgate construction.

(Continued on page 42)

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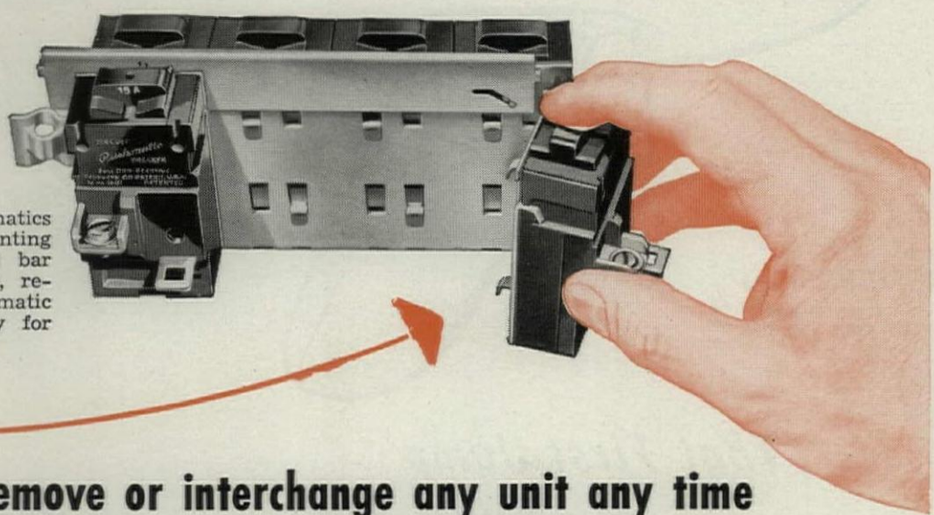

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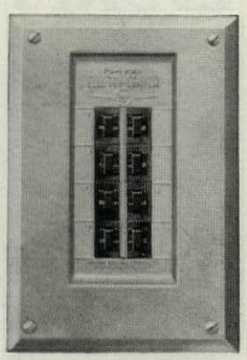

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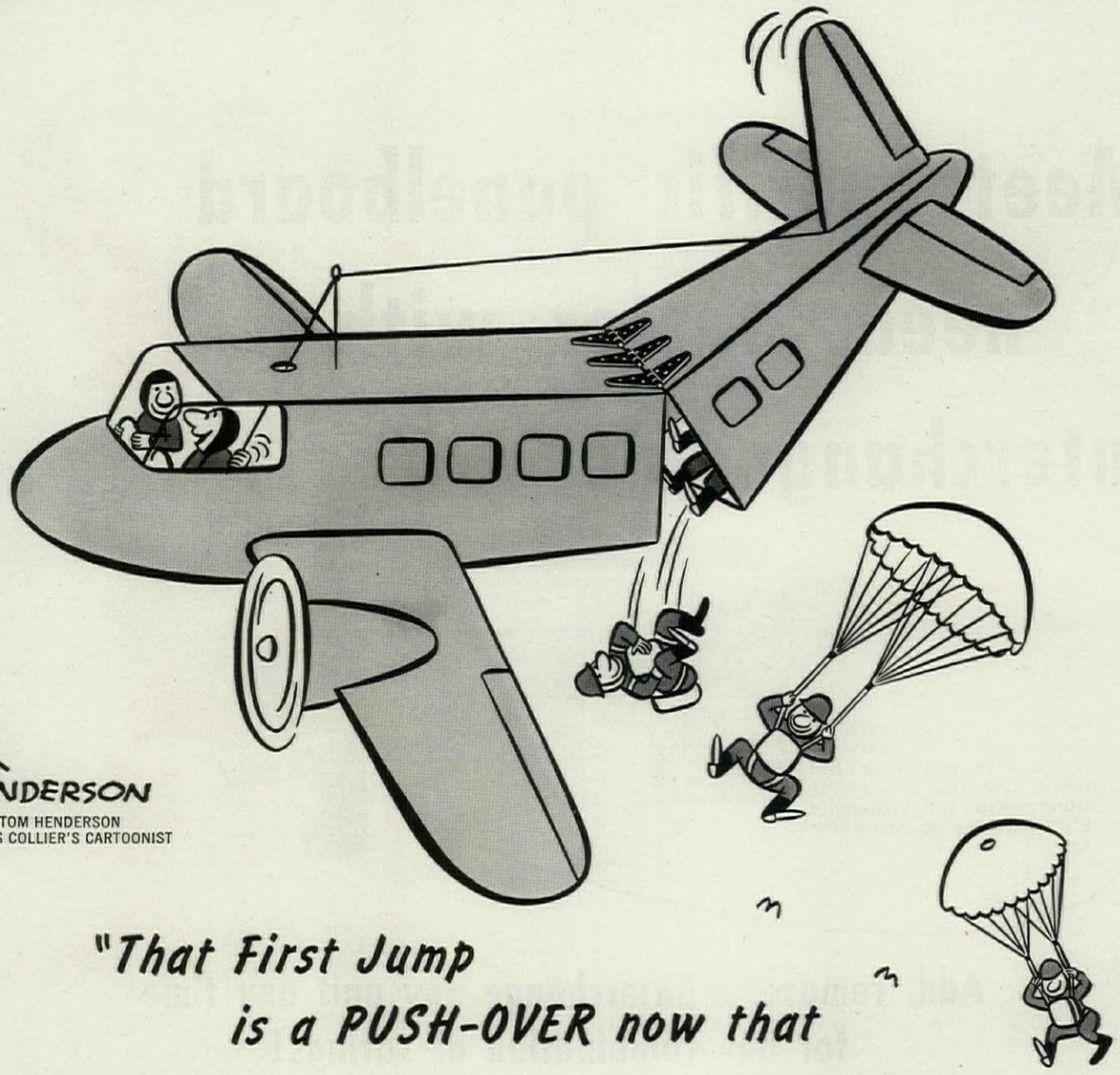

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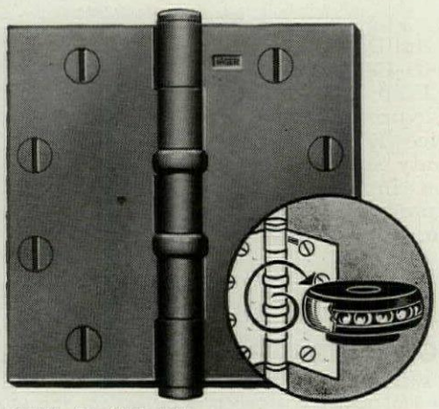

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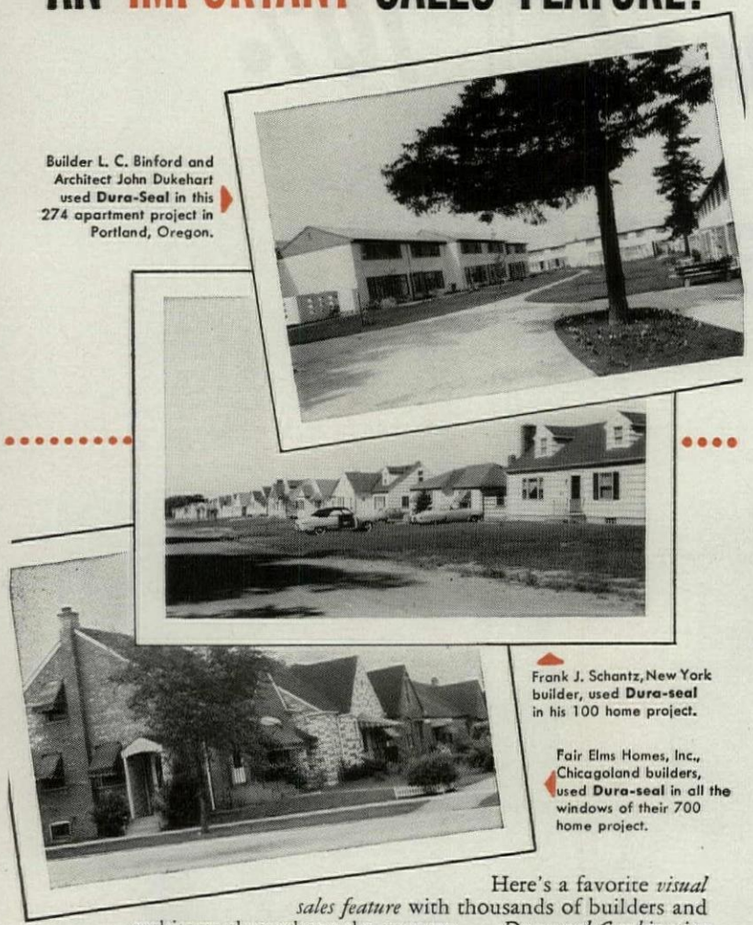

Builder L. C. Binford and Architect John Dukehart used **Dura-Seal** in this 274 apartment project in Portland, Oregon.

Frank J. Schantz, New York builder, used **Dura-seal** in his 100 home project.

Fair Elms Homes, Inc., Chicagoland builders, used **Dura-seal** in all the windows of their 700 home project.

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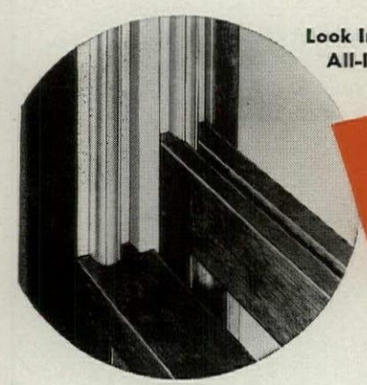

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BEHIND THE BLUEPRINTS



Washington Builder **N. NATHAN SHAPIRO** was born in the nation's capital, received his A.B. in 1938 from George Washington University, included architecture in his curriculum. Before World War II, he worked for his brother, an apartment house contractor, and after a wartime stint in the Navy, he became a merchant builder in 1947, switching from conventional design to Architect **CHARLES M. GOODMAN'S** outstanding brand of modern for the duplexes he is now building (p. 133).



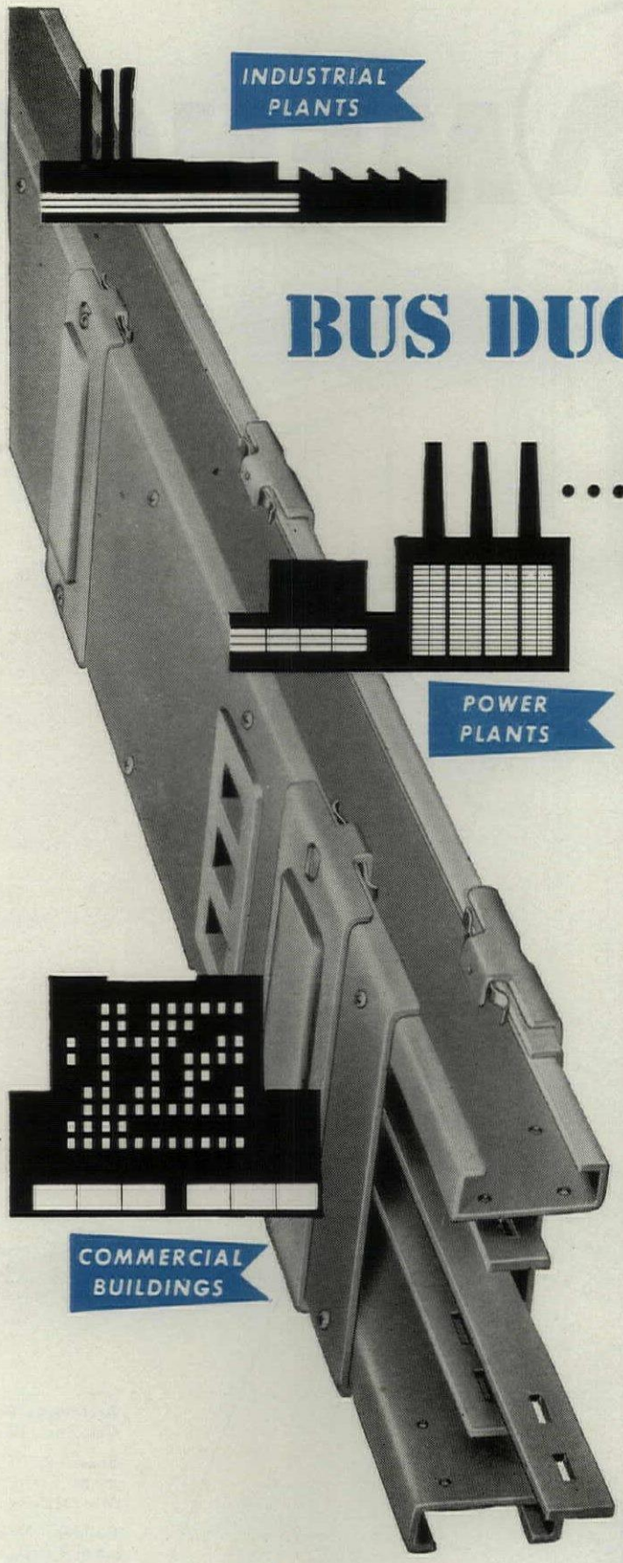
J. HERSCHEL FISHER is an architect with a master's degree and honors from MIT (1938). A Navy veteran, he returned to civilian life and a partnership in Dallas, Tex., with John P. Wiltshire in 1946. They design schools, hospitals and homes almost exclusively. The trim duplexes on p. 134 are Fisher's own baby, include some built for his own account.



HANS and **FLORENCE KNOLL** are the talented young husband and wife team at the helm of Knoll Associates, the ten year old firm now grown to include four furniture factories (producing only modern design), five showrooms, and an eight-man Planning Unit. Founder Hans G. Knoll (of an old European furniture family) is president, production head and coordinator. His pert wife, Florence, is company vice-president and designer, with an architectural degree from the Armour Institute of Technology. She has worked for such renowned modernists as Gropius, Breuer, Bennet, Carr and Loewy. The handsome New York offices and showcase for Knoll (p. 138) are a product of the Planning Unit, headed by Mrs. Knoll herself.



For 2½ years, Architects **WILLIAM W. CAUDILL** (36), **JOHN M. ROWLETT** (36), **WALLIE E. SCOTT** (30), and **WILLIAM M. PENA** (32), have been partners in a successful practise in College Station, Texas. Their organization, Caudill, Rowlett, Scott & Associates, has won national recognition from the AIA, the AASA and leading publications for its first-rate contemporary schools. Caudill studied architecture at Oklahoma A & M and MIT, taught it at Texas A & M, has been a school specialist since 1937. He is research architect at Texas Engineering Experiment Station where scale models of classrooms formed the basis for the school design devised by his firm and published this month (p. 170). Rowlett has degrees both in architecture and education, is an alumnus and professor of architecture at Texas A & M and the University of Texas. He and Caudill first became associated in 1946, Scott and Pena hold architectural degrees from Texas A & M.



BUS DUCT IS FLEXIBLE

...More power capacity at lower installed cost

Laying out new secondary power distribution systems? Expanding production line requirements? Do it more quickly, more economically, provide more flexibility for future change-overs—with Westinghouse Bus Duct.

First, Westinghouse Duct provides more power with less equipment—up to one-third less—than any comparably rated system of wireway, cable or conduit.

Second, Westinghouse Plug-In Duct is safer. Prestite insulators, impervious to moisture and of high mechanical strength, support the busbars, preventing accidental contact with live parts.

Third, Westinghouse Duct minimizes down time, cuts total installed cost at original installation, and during change-over or expansion. Sections of duct, completely prefabricated, are quickly and easily mounted.

Fourth, Westinghouse Duct is designed for virtually any type of building, and for any load requirement. For light loads, use Plug-In Duct. For high capacity use Low-Impedance Duct.

For complete information, call your Westinghouse representative or write for Manual B-4272-A, Westinghouse Electric Corporation, P. O. Box 868, Pittsburgh 30, Pa.

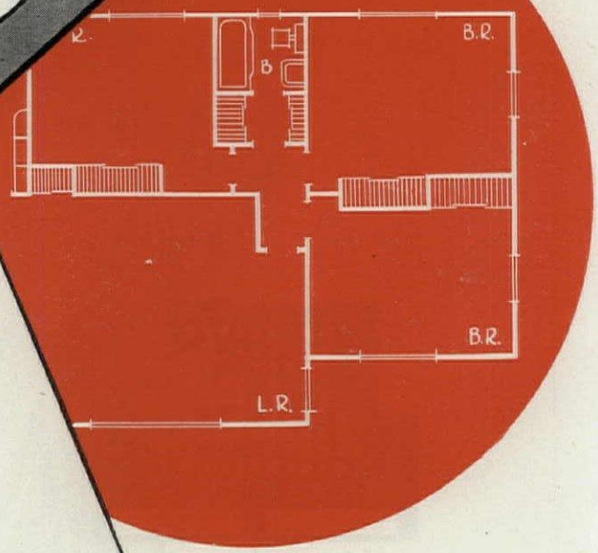
J-30059

DESIGN TESTED AND VERIFIED IN THE Westinghouse HIGH POWER LABORATORY

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

MENGEL





WESTOVER CONSTRUCTION CORP.
WESTOVER FIELD · MASSACHUSETTS
P. O. BOX 550

March 20, 1951

Walter W. Almond
85 Charles Street
Boston, Massachusetts

Dear Sir:

Since June of 1950, we have purchased from you approximately thirty-nine hundred Mengel Wall Closets and Closet Fronts for the 750 unit housing project which we currently have under construction for the U. S. Air Force Base, Westover Field, Chicopee, Mass.

We are very much pleased with the results obtained on our Westover Development with Mengel prefabricated sliding door wall closet fronts because they are quite easily assembled and installed. We use them as wall partitions and find that sliding doors greatly increase the usable floor space in each room, which makes for a much easier arrangement for furniture.

The service rendered us by both your company and the manufacturer has been entirely satisfactory and we are quite pleased to recommend these products on their own merits to all architects and builders of modern housing.

As further proof of our complete satisfaction, we are placing with your company an additional order for approximately eighteen-hundred Mengel closets and closet fronts for the last two sections of the Westover Air Force Base Project.

Very truly yours,

John J. Doherty

John J. Doherty, President
Westover Construction Corp.
Westover Field, Mass.

Architect: Prentiss & Carlisle Co., Inc., Bangor, Maine

Sponsor: Westover Development Corp., Westover Field, Massachusetts

Builder: Westover Construction Corp., Westover Field, Massachusetts

CLOSET WALLS REPLACE

3 MILES

OF CONVENTIONAL WALLS

for Westover Construction Corp.

PROVIDE Bigger, Better Closets!

ELIMINATE Many Interior Walls!

GIVE the Sales Appeal of Sliding Doors!

SAVE Time and Money!

The letter on the opposite page, written by Mr. Doherty, one of the East's outstanding developers, and President of the Westover Construction Corp., "tells all" about the benefits of Mengel Closet-Walls. The drawings and following data show specifically where and how these benefits were obtained.

This three-bedroom apartment is typical of the 750 new low-rent units at the Westover Field Air Base in Chicopee, Massachusetts. Its five Mengel Wall Closets (in red) replace 21 feet of conventional walls—provide each bedroom with a six-foot sliding-door closet—give the living room and bathroom each a three-foot sliding-door closet. The result: *lower costs for the builder . . . better closets for the "customer"!*

The whole project will use 3878 Mengel Wall Closets, replacing more than 15,750 lineal feet (nearly 3 miles) of conventional walls!

Factory-built Mengel Wood Wall Closets are complete units, shipped KD in a ready-to-assemble package. Nothing extra to buy. Installation is a matter of minutes. Each unit will provide a beautiful sliding-door closet for one room, a finished wall in the room on the other side. Mengel Closets are ideal for small homes or large, *for all construction which requires "clothes closets"!*

Mail the coupon for specification and installation sheets and our complete AIA catalog.

Cabinet Division
Dept. MB-5
The Mengel Company
1122 Dumesnil St., Louisville 1, Ky.

Gentlemen: Please send me complete information about Mengel Wall Closets.

Name_____

Firm_____

Street_____

City_____ State_____



Pittsburgh **INTERLOCK** Plastic Wall Tile...the best decision you ever made!



Pittsburgh INTERLOCK Plastic Wall Tile, accepted by the Dept. of Commerce, Bureau of Standards, meets all architects' requirements. Made of Styron in 22 modern decorators' colors, this new, lightweight tile has been specified by prominent interior designers for ships, hotels, institutions and public buildings as well as for private home developments.



The patented interlocking feature of Pittsburgh INTERLOCK Plastic Wall Tile is acclaimed by contractors and builders all over the country because it permits quicker, easier installation and foolproof self-alignment! Saves time and labor! Requires no grouting! Eliminates mastic clean-up problems! Once applied, INTERLOCK locks on for the life of the wall!



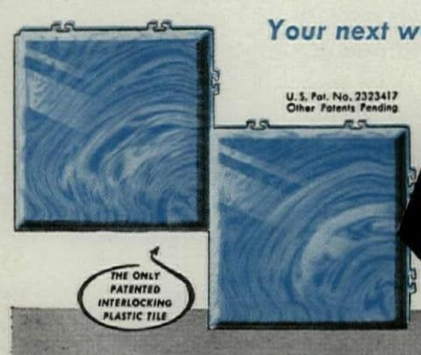
Economical to install, Pittsburgh INTERLOCK Plastic Wall Tile is also economical to maintain. Will never chip, crack, peel or craze! No moisture absorption! Vermin-proof! Cuts painting costs! Management points with pride to INTERLOCK'S gleaming cleanliness. No dirty grout lines. And so easy to clean! Just a damp cloth keeps it sparkling!



Homes are bought and sold every day because of the arresting beauty of their bathrooms and kitchens! Pittsburgh INTERLOCK Plastic Wall Tile with the newest Bevel Edge gives wall surfaces more color and more lustrous richness than ever! INTERLOCK has been laboratory tested and is the proud recipient of the Good Housekeeping Guaranty Seal!

Your next wall problem will be solved with

Guaranteed by Good Housekeeping



PITTSBURGH **INTERLOCK** PLASTIC WALL TILE

Write today for details to Dept. AY

JONES & BROWN, Inc., *National Distributors*
439 Sixth Avenue, Pittsburgh, Pa.

LETTERS—WASTE IN BUILDING

WASTE IN BUILDING

Sirs:

. . . The Round Table report on eliminating waste in the home building industry (Feb. '51) . . . has been studied by the NPA Building Materials Division and is now in the hands of Mr. Howard Coonley, in his capacity as chairman of the newly formed Conservation Coordinating Committee, which includes representatives of all the important Government agencies. . . .

Mr. Coonley has indicated to me that the recommendations make a fine contribution to conservation in the building industry and that he will take them up with his Committee immediately.

W. H. Harrison, *Administrator*
Defense Production Administration
Washington, D. C.

Sirs:

. . . The Round Table program on waste in commercial and industrial building (Mar. '51) seems to contain much useful material.

Charles E. Wilson
Director of Defense Mobilization
Washington, D. C.

Sirs:

. . . Any efforts to eliminate waste in building has the hearty approval of all Mortgage Bankers and . . . the general principles as stated in your report certainly have our support and encouragement.

Milton T. MacDonald, *President*
Mortgage Bankers Assoc. of America
Chicago, Ill.

Sirs:

As lumber dealers, may we thank you for your program for reducing the cost of home building.

The ways in which you are attacking this enormous problem are practical and concrete. Please be assured of the enthusiastic and vigorous support of retail lumber dealers in working out this program to the ultimate advantage of all home builders.

Deyo W. Johnson, *President*
Wm. H. Deyo & Co., Inc.
Ellenville, N. Y.

Sirs:

We discussed your excellent Round Table article at great length at NAHB's recent Executive Committee meeting in Washington and are sending a copy of this article to all of the members all over the country. . . .

Keep up the good work and thanks for the help that we get from your fine magazine.

Richard Hail Brown, *President*
Birmingham Assoc. of Home Builders
Birmingham 3, Ala.

Sirs:

The article has caused a great deal of interest in our area. . . .

Your organization should be highly com-

(Continued on page 50)

Every Plastic advantage at a moderate cost!



Flor-Ever®
Vinylite PLASTIC FLOOR COVERING

design

■ **Vinylite Colors:** FLOR-EVER features the clean, lucid colors typical of plastics—whiter whites; blacker blacks; luscious reds, greens, blues and yellows, with marbelized mixtures. There are, today, 21 FLOR-EVER colors. A set of samples is freely available to every accredited architect, designer or builder.

■ **Tiles and rolls (plus feature strips):** FLOR-EVER is available by the YARD (in six widths: standard 6-foot, plus 42", 36", 30", 24" and 9") AND in 9" x 9" TILES, AND in 1" feature STRIPS. Thus your designing scope is unlimited. Furthermore, FLOR-EVER is also an ideal sink or counter top and is made in the right widths for such use. You can now design with all major horizontals matching perfectly.

function

■ **Non-Porous—cuts cleaning care:** FLOR-EVER is NON-POROUS—which means that soil cannot grip *into* the surface and therefore is removed with far less effort.

■ **Grease-proof, alkali-proof, water-proof.** No animal, vegetable or mineral oil, grease or fat can ever stain, soften or in any other way damage FLOR-EVER. The harshest soaps, cleaners and detergents will not affect it.

■ **Stain-and-spot-resistant.** FLOR-EVER is almost completely inert and stable chemically—cannot be stained, discolored nor in any other way affected by household acids, chlorides, bleaches and other attacking agents normally encountered.

■ **Outwears most other floor coverings.** FLOR-EVER is amazingly resistant to abrasion. For instance, it will outwear floor coverings 150% as thick and the colors cannot be worn off because they are IN the Vinylite clear through to the Permo-Seal back.

■ **Priced for popular budgets.** Though luxurious in appearance and performance, FLOR-EVER is not a premium floor. Its installed cost is comparable to that of most popular high quality floor coverings. Investigate.

send for your sample set

If you are a practicing architect or designer, an active builder, or otherwise concerned with specifying floor coverings, we shall gladly have delivered to you full descriptive and technical material plus a complete set of samples, *without obligating you in any way*—and we know this material will help you do your job more efficiently and profitably. Mail the coupon.



DELAWARE FLOOR PRODUCTS, INC.
Architects Service Dept. MB-5-51
295 5th Ave., New York 16, N. Y.

Without obligation, please have your representative deliver a set of FLOR-EVER color samples, usable as a guide in specifying or ordering.

Name_____

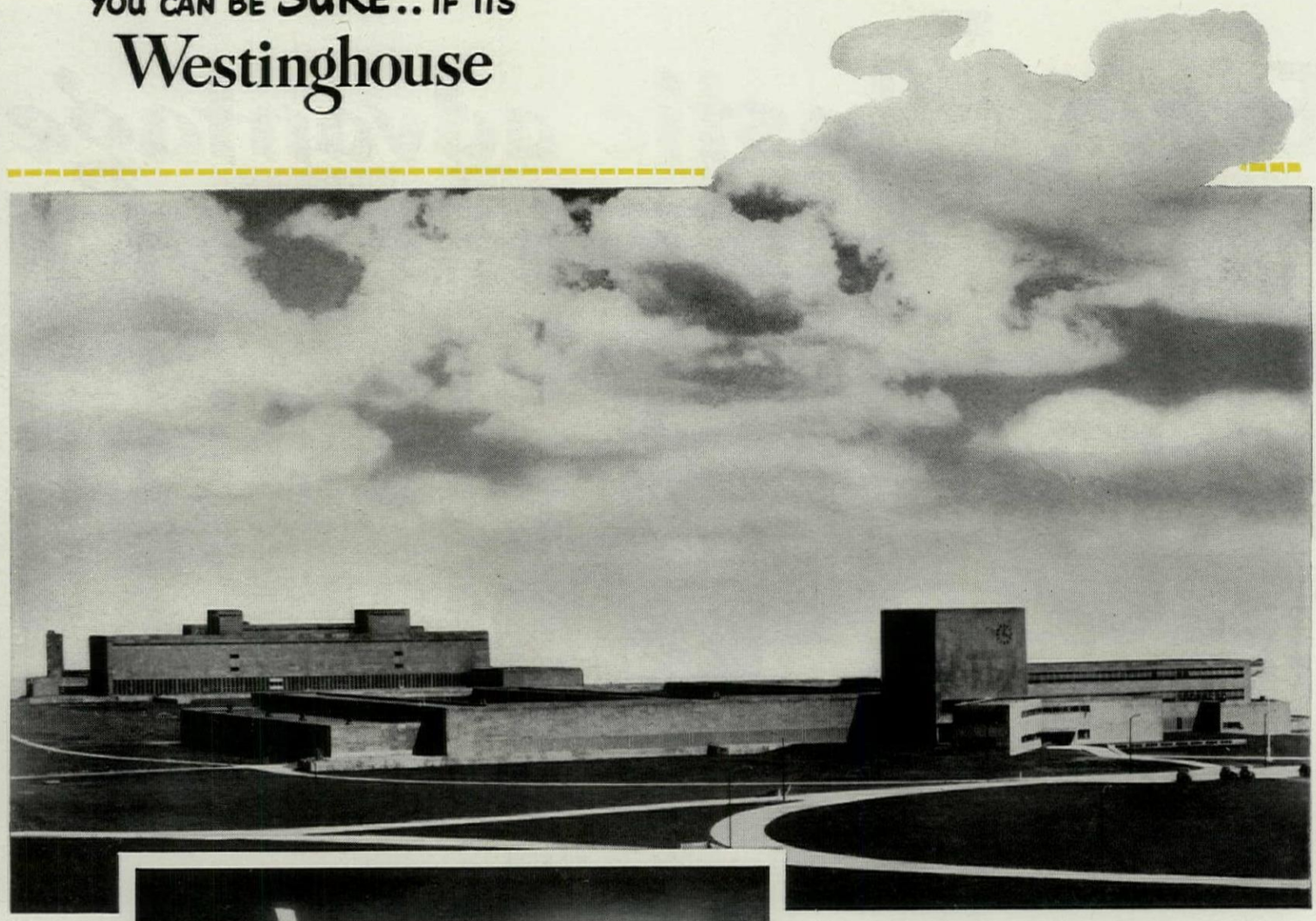
Company_____

Address_____

City_____ State_____

Manufactured by one of America's leading floor covering manufacturers:
DELAWARE FLOOR PRODUCTS, INC., *Established 1930*
Plants: Wilmington, Del. Manufacturers of FLOR-EVER, Kolorflor, Duralin.

YOU CAN BE SURE.. IF IT'S
Westinghouse





The Chicago South District Filtration Plant shown here is the largest in the world, serving more than a million and a half people. The plant has operated at an hourly peak of 546 mgd with only 70 of the 80 filters in service.

This mezzanine switchgear room in the lower left pumping station is an example of the way Westinghouse designs and manufactures electrical equipment for a co-ordinated, efficient system. (Right) High-voltage switchgear gives necessary protection on incoming lines, as well as feeders, and supplies power to large pump motors and station transformers. (Left) Low-voltage switchgear controls station auxiliaries such as priming pumps, crane motor feeder and valves. (Rear center) Network protectors and 120/208-volt distribution for building lighting and miscellaneous power. (Front center) Control desk with mimic bus, indicating instruments and circuit breaker switches centralizes control of plant equipment.

Westinghouse
EQUIPMENT
FOR PUBLIC WORKS

Unit Responsibility

ASSURES WATER WORKS EFFICIENCY

For any water works, large or small, higher operating efficiency depends in part on your electrical manufacturer.

He should provide every type of electrical equipment . . . give you a co-ordinated engineering application . . . based on practical experience in water works electrification.

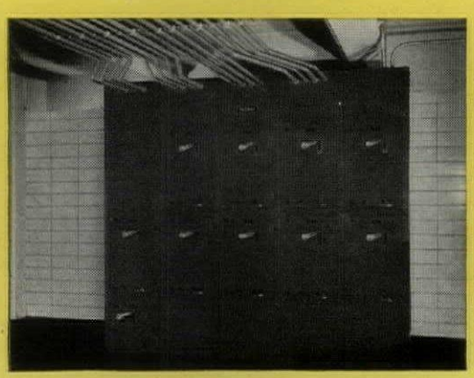
These elements add up to unit responsibility and mean reduced operating costs for your plant. You get them all from Westinghouse:

Westinghouse makes a complete line of electrical equipment for water works. This includes "Unitized" metal-clad switchgear; packaged power centers, power transformers and unit substations; control and control centers; motors and gearmotors, as well as other electrical apparatus and supplies.

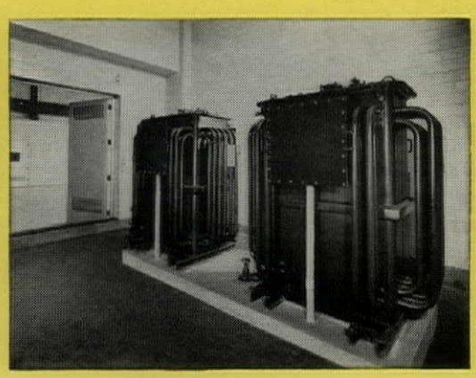
Westinghouse Consulting and Application Engineers are available to work with you. They will help you select and apply the right equipment to give you a co-ordinated, efficient electrical system.

Westinghouse brings you a background of long experience in applying electrical equipment to water works. The Chicago South District Filtration Plant, shown here, is but one more in a large list of outstanding installations where Westinghouse unit responsibility has been *proved* on the job.

For help on your water works electrification problems, call your nearest Westinghouse District Office, or write to Westinghouse Electric Corporation, P. O. Box 868, Pittsburgh 30, Pa. J-94818



This control center on the third floor of the Chemical Building groups into one unit all the combination linestarters and motor control for fan motors, agitator drives and other auxiliary equipment in this plant area.



These two 300-kva, 3-phase, 60-cycle, 2300/120-208-volt, liquid-filled distribution transformers are located in the west pump room and supply power for the building lights and equipment in the Filtration Plant.



Expanding Again . . . with Quonsets! *Successful experience with this large Quonset plant at Delaware, Ohio, has prompted Ranco, Inc., manufacturers of thermostatic controls, to build a new Quonset plant at Plain City, Ohio.*

Build Quicker with QUONSETS

IDEAL FOR FACTORIES, WAREHOUSES MACHINE SHOPS OR STORAGE BUILDINGS

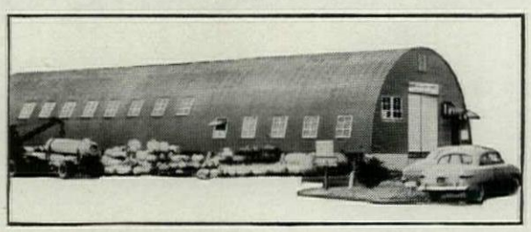
For additions to your present plant—or for new plants—Quonsets mean *fast* completion, economy of materials, adaptability to *any* use. Also, should plants need more expansion later, you can add Quonset to Quonset, according to the need.

Made of N-A-X HIGH-TENSILE steel, Quonsets provide noncombustible construction and permanence far surpassing less modern buildings. They require little upkeep—are easily maintained. Let Quonsets serve you now. Write us today.

STRAN-STEEL AND QUONSET REG U S PAT OFF.

GREAT LAKES STEEL CORPORATION
Stran-Steel Division, Ecorse, Detroit 29, Mich.

PRODUCER OF N-A-X HIGH-TENSILE STEEL



Expansion Completed in 32 Days! *Quonset 40 by 240 feet increased facilities quickly for General Gas Corporation Baton Rouge, La.*

NATIONAL STEEL CORPORATION

LETTERS—WASTE IN BUILDING

mended for taking the initiative to assure the maintenance of a sound economy in the nation during the years ahead by lowering the American standard of wastefulness and increasing the American standard of productivity and thereby preventing a lowering of the American standard of living. . . .

FREDERICK C. KRACKE
Exec. V. P.
General Contractors Association of Contra Costa County, Inc.
Walnut Creek, Calif.

Sirs:

. . . We offer our wholehearted support of the program. It is urgent that your program receive the widest possible publicity and endorsement at the local level in order that a general movement to amend building codes may be initiated.

Needless to say, approval by the FHA will also exert a substantial pressure toward the modification of local codes.

G. B. FOOTE, *Treasurer*
Control Engineering Corp.
Canton, Mass.

Sirs:

. . . If you can get minimum standards, like the proposed new National Plumbing Code, approved nationally by respective headquarters, we at the local level should be able to force acceptance in our own communities. I shall be happy to cooperate. . . .

The best of luck in your worthy campaign!

EDWIN M. EATON, *President*
Fresno Guarantee Building-Loan Assoc.
Fresno, Calif.

Sirs:

The report . . . is splendid work and should have most worthy results. We thoroughly agree with the conclusions reached.

SAMUEL E. HOMSEY, *Architect*
Wilmington, Del.

Sirs:

. . . It was so sensible and interesting that I found myself enrapt until I had read and weighed every word.

It sure is heartening to know that the blame for this mess cannot be placed on the ones who know. There is hardly any point or detail in which I differ from them. It gave me a lift when I was about to give up in despair.

LELAND S. MILLER
Albion, Ind.

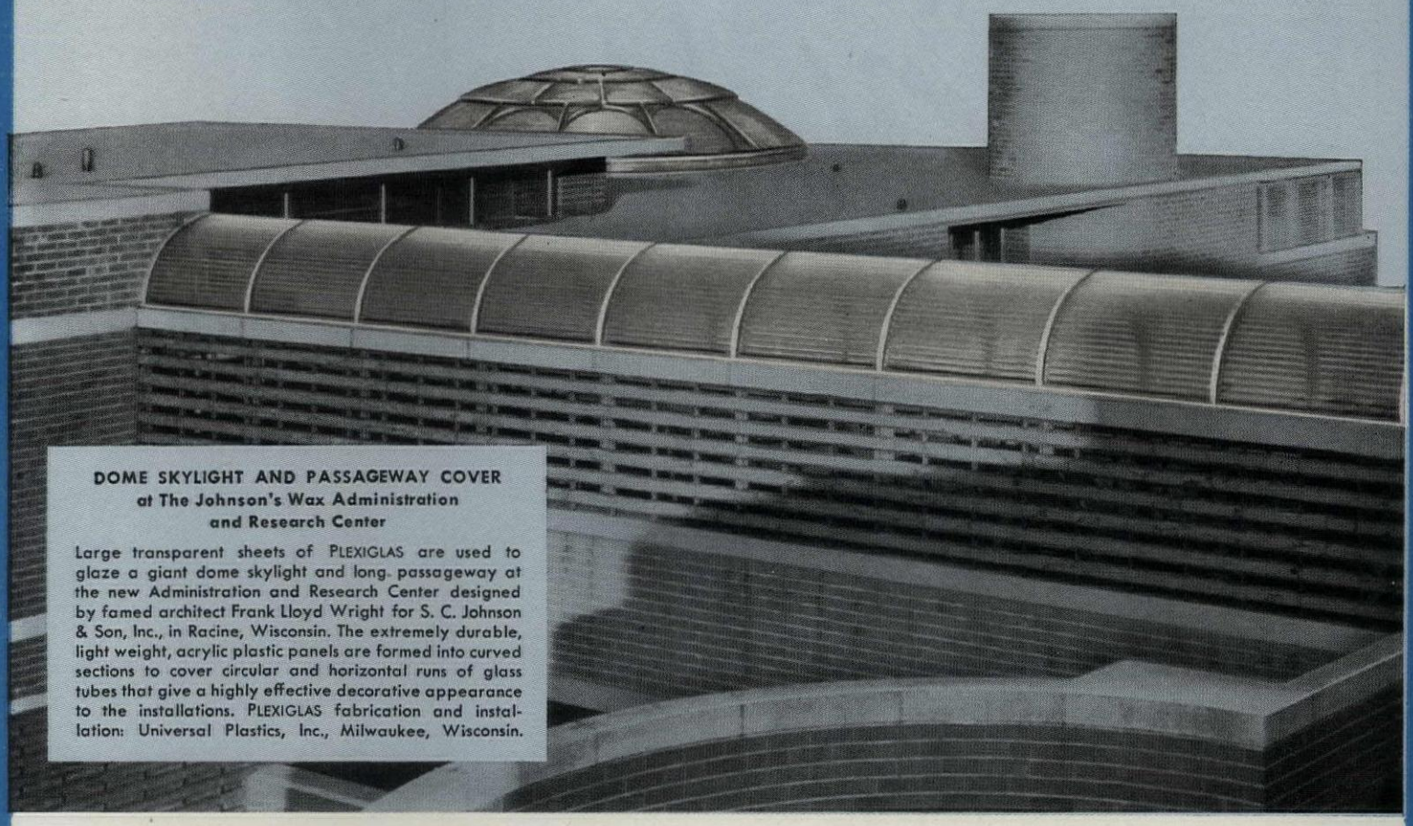
Sirs:

. . . An excellent, well-appreciated article . . . The thoroughness of preparation that went into that article is one of the main reasons I am a staunch subscriber to the magazine.

HERMAN LEICHTUNG
Wendeley Commerce Corp.
New York, N. Y.

(Continued on page 52)

These Glazing Jobs Could Have Been Tough...



DOME SKYLIGHT AND PASSAGEWAY COVER at The Johnson's Wax Administration and Research Center

Large transparent sheets of PLEXIGLAS are used to glaze a giant dome skylight and long passageway at the new Administration and Research Center designed by famed architect Frank Lloyd Wright for S. C. Johnson & Son, Inc., in Racine, Wisconsin. The extremely durable, light weight, acrylic plastic panels are formed into curved sections to cover circular and horizontal runs of glass tubes that give a highly effective decorative appearance to the installations. PLEXIGLAS fabrication and installation: Universal Plastics, Inc., Milwaukee, Wisconsin.

PLEXIGLAS Made Them Easy

Look again at the large dome and long passageway—and discover some interesting glazing problems. Curved, one-piece sections are required—up to 5′ x 10′ in size! Design calls for three-dimensional curvatures in the 25-foot-diameter dome, and 24″-radius half cylinders for the 60-foot passageway cover. Finally, there's the problem of safe shipment and erection of the transparent panels.

PLEXIGLAS acrylic plastic simplified the job. Large thick sheets—half-inch thickness for these installations—can be formed without difficulty to almost any shape. Toughness and resilience permit safe shipment of formed sections, and insure against breakage in service. And because PLEXIGLAS weighs less than half as much as glass, panels can be erected easily, safely, with far less support.

Other advantages of PLEXIGLAS? Optical clarity or light-diffusing translucence, lasting beauty, resistance to sun and weather. In imaginative, modern construction of all kinds—in storefronts, building facades, glazing, signs and lighting—this sparkling acrylic plastic plays an ever-greater part. We'll be glad to send you full details without obligation.

CHEMICALS FOR INDUSTRY

A steadily increasing percentage of PLEXIGLAS production, now at record levels, is required for the defense mobilization program. The supply available for civilian applications is limited.

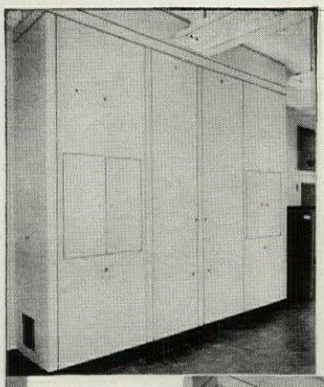
PLEXIGLAS is a trade-mark, Reg. U. S. Pat. Off. and in principal foreign countries.

Canadian Distributor: Crystal Glass & Plastics, Ltd., 54 Duke Street, Toronto, Ontario, Canada.

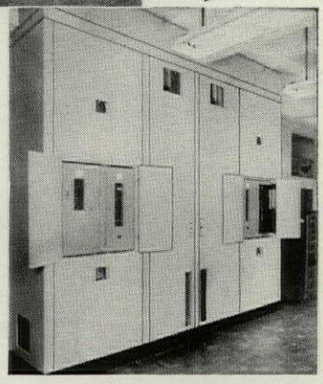
ROHM & HAAS COMPANY

WASHINGTON SQUARE, PHILADELPHIA 5, PA.

Representatives in principal foreign countries



NEWS Flash! ★ ★ ★



Partitions by the Mills Company, Manufacturers of Movable Metal Partitions, Cleveland 10, Ohio.

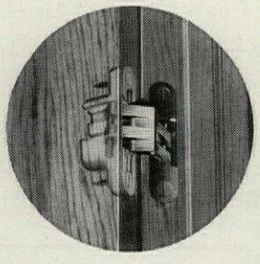
NAVY USES 4 MILES OF PARTITIONS STREAMLINED WITH . . . . .

SOSS INVISIBLE HINGES

The above example is typical of many similar installations, using SOSS INVISIBLE HINGES, in the United States Naval Ordnance Laboratory at White Oak, Maryland . . . one of the most modern and best equipped research and development laboratories in the world. Over 4 miles of Mills movable metal partitions, streamlined with SOSS INVISIBLE HINGES, were used in this project.

• • •

You, too, will find "the hinge that hides itself" ideal for use in every type of MODERN building. The SOSS HINGE is the only hinge that eliminates unsightly, protruding hinge butts. Furthermore, it is the ONLY hinge that helps architects meet the exacting demands of modern design for smooth, flush, streamlined surfaces. For FREE Blue Print Catalogue, that gives complete architectural information on the SOSS HINGE, write to:



SOSS MANUFACTURING COMPANY

21779 HOOVER ROAD

DETROIT 13, MICHIGAN

A. I. A. File No. 27-B-1

LETTERS—WASTE IN BUILDING

Sirs:

. . . I believe that each of the Senators and Representatives should receive a copy of this Round Table report and I have sent my copy to Senator Robert A. Taft and would like to send a copy to the Ohio Representative and to Senator Bricker. . . .

L. G. Blair
Toledo, Ohio

• Single reprints of the Round Table reports are available free; additional copies at 5 cents each postpaid—Ed.

Waste and FHA

Sirs:

You have my enthusiastic support in your program against waste in house building.

For some time now FHA has designed better than 95% of the homes built in this area. Architects and designers are getting only 3% or 4% of the work. The commercial areas of our cities here in the Rocky Mountain west are designed in effect by tin shops and neon sign companies. . . .

Since the FHA office has been so successful in sprinkling their colonial future slum areas across the nation (and they are getting slightly frayed at the shutters), let us do all we can to make it necessary that the only house that can be built is a good, honest, up-to-date house.

If FHA, the city codes, tin shops, the neon sign companies, newspapers and building magazines are guiding the hand that holds the pencil on the tracing paper . . . thank God for The Magazine of Building.

Richard K. Hatch, *Designer-Builder*
Provo, Utah

Sirs:

. . . FHA minima should be brought under fire. With their relaxation to accept construction methods discussed in your Round Table Report, we'd all benefit—the home builder most.

Local building codes, union rules, financing—none offers headaches in the small towns and rural areas. FHA offers the only obstruction to a reasonably priced home. . . .

Irvin M. Patterson
The Long-Bell Lumber Co.
Fairview, Okla.

Sirs:

FHA is entirely unrealistic . . . In meeting FHA minimum requirements the money has to go into nonfunctional features.

Item: 8″ reinforced concrete basement walls (with cement at $2.75 per sack!).

Item: Providing the equivalent of 4% of the floor area in "natural" ventilation, e.g. "insulated" louvers integral with fixed double-glazed sash! (In this locality where wind and cold are serious design problems, double hung windows just aren't used any more.)

What is needed is more willingness on the part of FHA to permit design to meet the facts of 40

(Continued on page 56)



Prefinished ...for beauty and economy



The famous Bruce "Scratch Test"

Half of this panel of flooring oak is finished by the Bruce penetrating seal method, the other half with a commonly used surface-type finish. When a coin is scraped across the panel, the ordinary finish scratches and chips away—but the Bruce finish is unharmed because it's "in the wood."

■ Bruce Hardwood Floors (Strip, Block, Ranch Plank) are *prefinished* because factory methods produce a penetrating seal finish that cannot be equalled on the job. Tests prove it will outwear ordinary finishes at least 3 to 1. The factory-applied finish brings out all the natural beauty of the wood . . . doesn't cover up or discolor the grain as surface finishes do. Housewives find, too, that *prefinished* Bruce Hardwood Floors are far easier to keep clean and beautiful.

The use of *prefinished* floors also saves from 3 to 5 days' time on a house job, because the floor is ready to use as soon as laid. Yet, with all these advantages, the cost of *prefinished* Bruce Hardwood Floors is normally less than for the same grade of unfinished flooring plus the expense of sanding and finishing on the job. Write for complete information—see our section in Sweet's Files.

E. L. BRUCE CO., MEMPHIS 1, TENN.

Bruce

HARDWOOD FLOORS

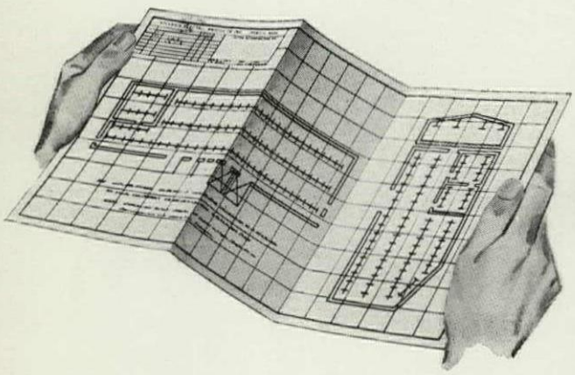
PREFINISHED Strip, Block, Ranch Plank

BRUCE

Other Bruce Products: Unfinished Flooring (Block, Strip, Plank) • Lumber and Wood Parts • Terminix • Floor Cleaner, Waxes, Finishes

Want skillful craftsmen...





to follow your layouts...

with the finest lighting fixtures?



...see the lighting contractor who shows this sign



In addition to all the above advantages, you'll save valuable time and eliminate a lot of burdensome detail . . . when you call a qualified lighting contractor.

And, when you call a lighting contractor who shows the Sylvania Sign, you'll be talking to an expert who is familiar with the many problems of today's lighting business . . . who has up-to-the-minute knowledge concerning materials, as well as the latest lighting regulations.

In addition, the Sylvania lighting contractor offers you those superior Sylvania Fluorescent Fixtures and long-lasting Sylvania tubes. All are completely guaranteed for one year . . . every ballast, starter, tube, and part on orders of 25 or more fixtures.

For illustrated folder showing the complete line of Sylvania Fluorescent fixtures, mail the coupon below . . . NOW!



SYLVANIA ELECTRIC

FLUORESCENT TUBES, FIXTURES, SIGN TUBING, WIRING DEVICES; LIGHT BULBS; RADIO TUBES; TELEVISION PICTURE TUBES; ELECTRONIC PRODUCTS; ELECTRONIC TEST EQUIPMENT; PHOTOLAMPS; TELEVISION SETS

Sylvania Electric Products Inc.
Dept. L-5105, 1740 Broadway
New York 19, N. Y.

Please send me new folder describing Sylvania Fluorescent Fixtures.

*Name*_____

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*City*_____ *Zone*____ *State*_____



COFAR

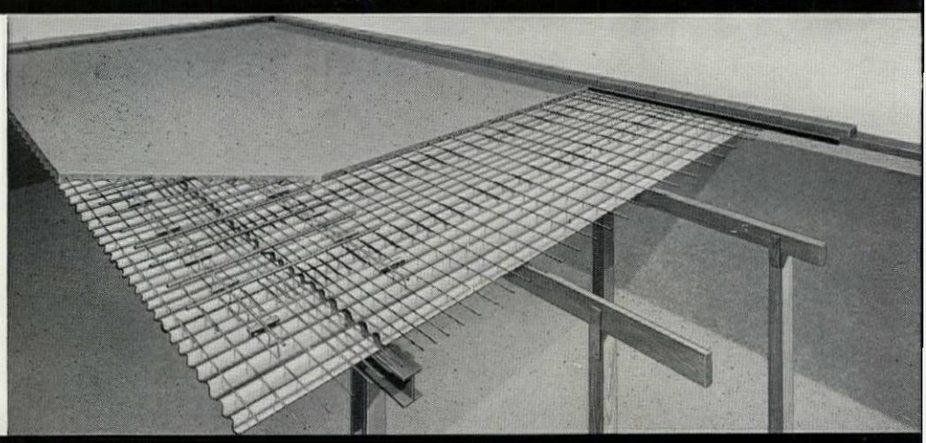
. . . A NEW PERSPECTIVE IN BUILDING!

COFAR

- Reinforced concrete construction.
- High-strength, deep-corrugated steel manufactured with welded closely spaced transverse wires (T-wires).
- Positive reinforcement permanently anchored to and combined with structural concrete.
- Concrete floors and roofs without forms.

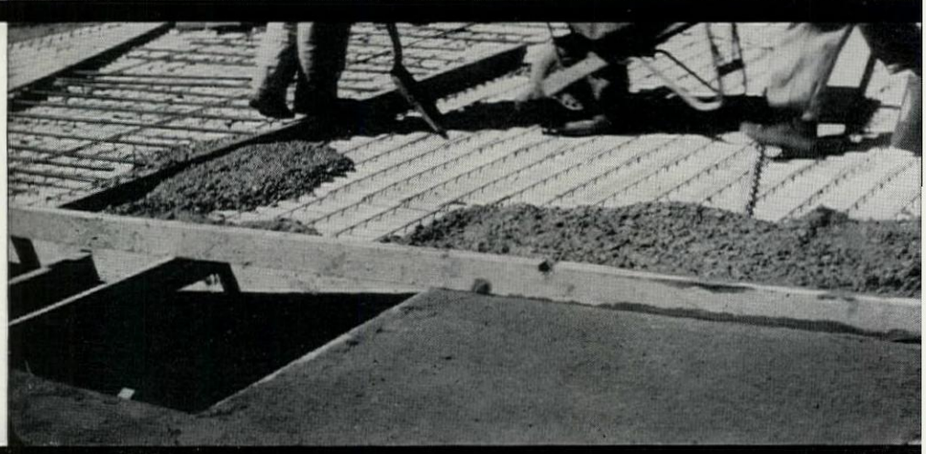
STRENGTH UNLIMITED

COFAR! Deep-corrugated steel, 100,000 psi and stronger (the main reinforcement), and T-wires (temperature reinforcement) in one manufactured product . . . all the positive steel needed in the structural concrete slab! Design follows normal concrete structural procedures. Full range and design freedom is given concrete slab construction, with continuity and weight saving. Hot-dip heavy galvanizing insures building-life permanence. Build strong . . . build COFAR.



TIME AND MONEY SAVED

COFAR makes concrete floor and roof construction a one-stage operation . . . no forms to build and tear down. Construction is clean and fast. Concreting in multi-story buildings moves indoors out of the weather. Large or small, your building is better, costs less with COFAR.



SPACE AND LIGHT RECAPTURED

Bright, clean, corrugated-pattern COFAR ceilings give the new look to many homes. Fire resistant for any exposure with lightweight modern ceiling protection. COFAR saves enough head room and deadweight to add stories to skyscrapers. Business, office or residential . . . COFAR is the answer.



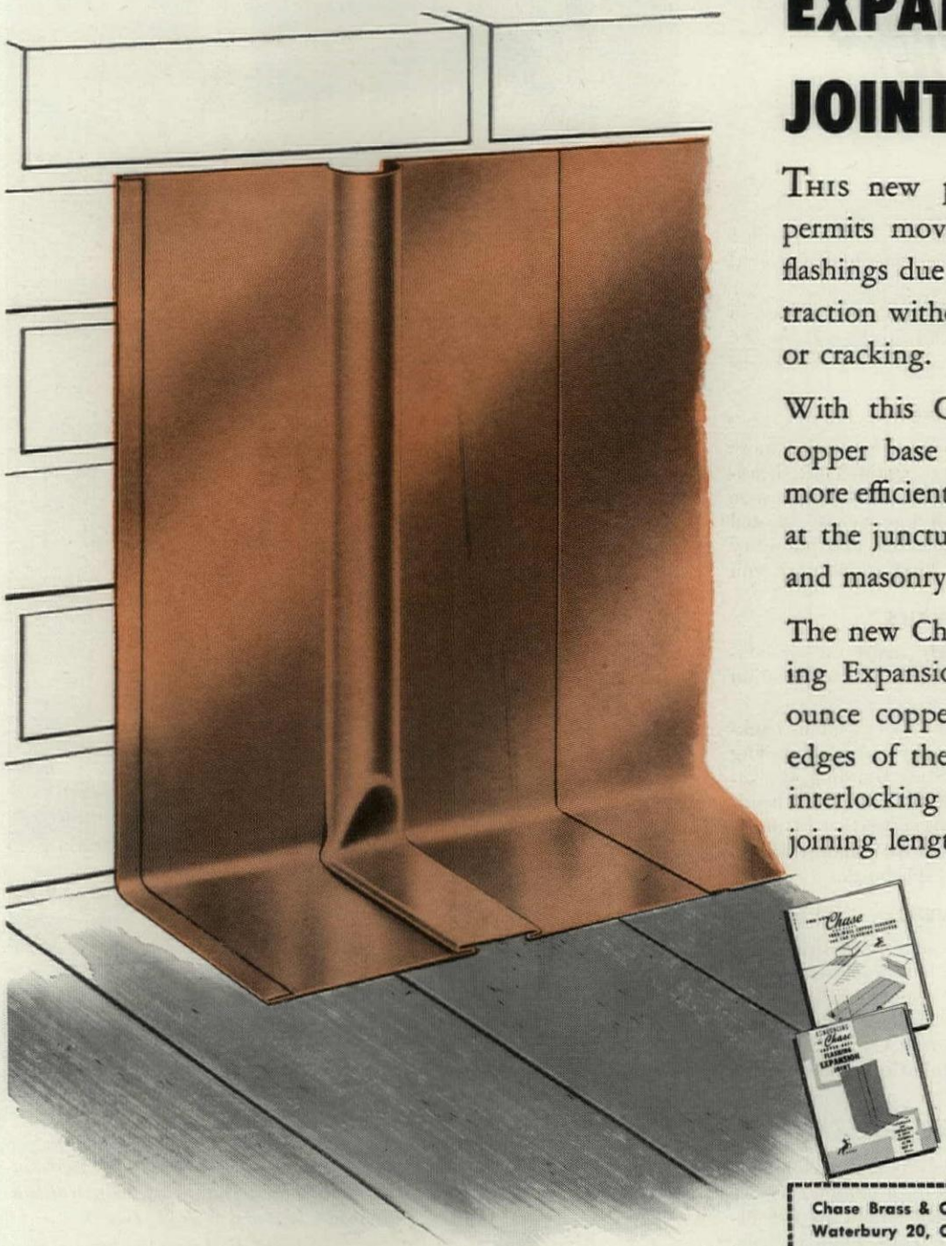
- *ADVICE on application and design by qualified COFAR engineers.*
- *REVIEW of all COFAR designs.*
- *ESTIMATES and COSTS for any COFAR project.*
- *KNOW-HOW from experience on many COFAR jobs.*

GRANCO STEEL PRODUCTS CO.

(Sudsidiary of Granite City Steel Co.)

GRANITE CITY, ILLINOIS

Something new in Copper Base Flashing . . .



CHASE BASE FLASHING EXPANSION JOINT

THIS new patented Copper Joint permits movement of copper base flashings due to expansion and contraction without danger of buckling or cracking.

With this Chase Expansion Joint, copper base flashing becomes even more efficient and economical for use at the juncture of flat built-up roof and masonry wall.

The new Chase Copper Base Flashing Expansion Joint is made of 18 ounce copper. Open seams on the edges of the joint permit fast, easy interlocking and soldering to the adjoining lengths of base flashing.

FREE FOLDERS: *You will also want to know about the new Chase One-piece Thru-Wall Copper Flashing and Cap Flashing Receiver. Write for folders on both these new developments in copper flashing.*

Chase Brass & Copper Co., Dept. MB551
Waterbury 20, Conn.

Please send me your free folders

☐ *Chase Copper Base Flashing Expansion Joint.*
☐ *The New Chase One Piece Thru-Wall Copper Flashing.*

NAME_____

POSITION _____

FIRM_____

STREET_____

CITY_____ **STATE**_____

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WATERBURY 20, CONNECTICUT • SUBSIDIARY OF KENNECOTT COPPER CORPORATION

• *The Nation's Headquarters for Brass & Copper*

Albany†	Chicago	Denver†	Kansas City, Mo.	Newark	Pittsburgh	San Francisco
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Hint of things to Come?

Who knows what the future will call on you to build? Windowless, air conditioned structures above ground —or *below* ground?

Either way, the techniques York has developed in air conditioning windowless buildings—from the world's first to the world's newest—are freely available to you.

IF WAR SPREADS

You'll also be using air conditioning more and more as a vital production tool. Here again York, headquarters for mechanical cooling since 1885, can save you research and detail—with knowledge gained through years of solving temperature and humidity problems for practically every kind of industry you can name.

IF PEACE PREVAILS

Venture capital will increasingly insist on air conditioning in housing, office and factory construction *and modernization.*

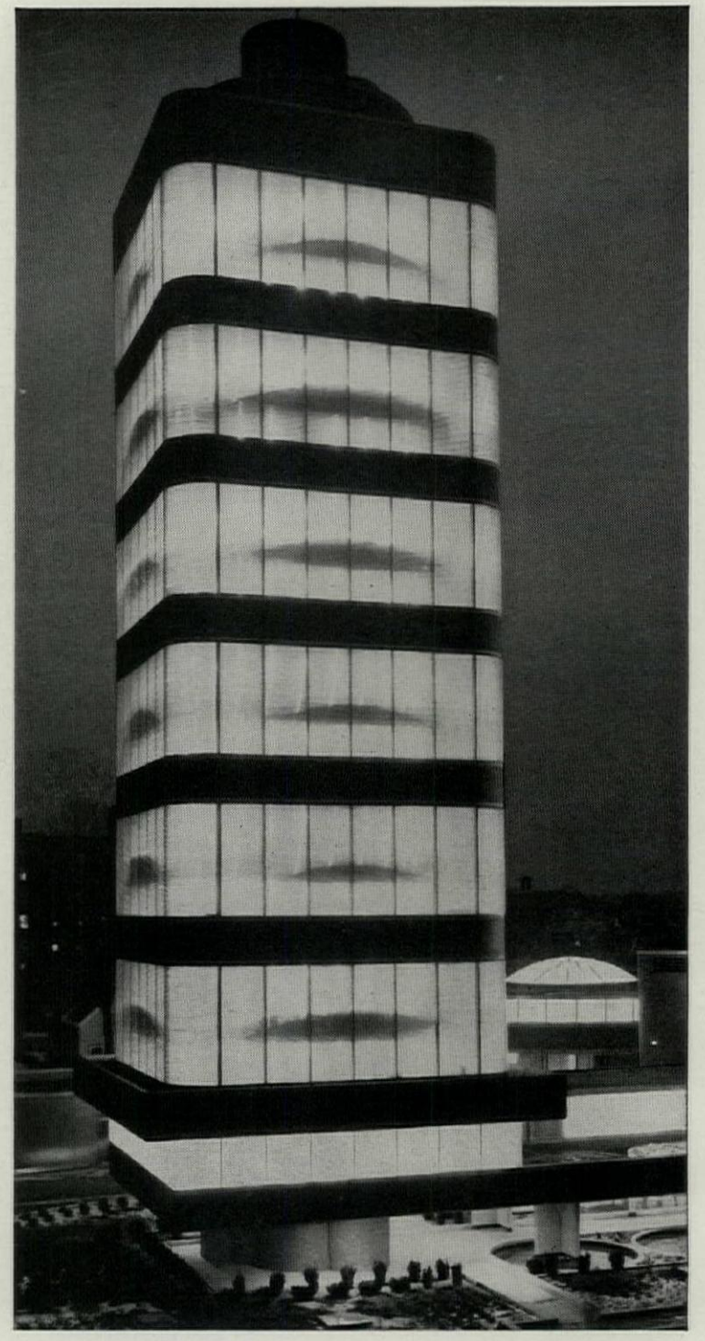
Again you can draw from York's tremendous backlog of experience with the tricky jobs of cooling existing giants like the Empire State Building, Rockefeller Center's Esso Building, F. W. Woolworth headquarters . . . and with the big jobs of weather planning for new projects like Philadelphia's Rittenhouse Apartments, tallest of air conditioned dwellings.

IN EITHER EVENT

Use the lessons we've learned: our nationwide network of trained specialists can help you cut tedious, costly planning and detailing from your work. It's York's policy to channel contract air conditioning through the Architect, Engineer or Contractor. And York relieves you of post-installation responsibility with an exclusive

CERTIFIED MAINTENANCE CONTRACT

that takes all maintenance off your client's shoulders, assures uninterrupted operation for a nominal service fee. Check today with your nearby York Representative or write York Corporation, York, Pennsylvania.



YORK AIR CONDITIONING for a Windowless Wonder

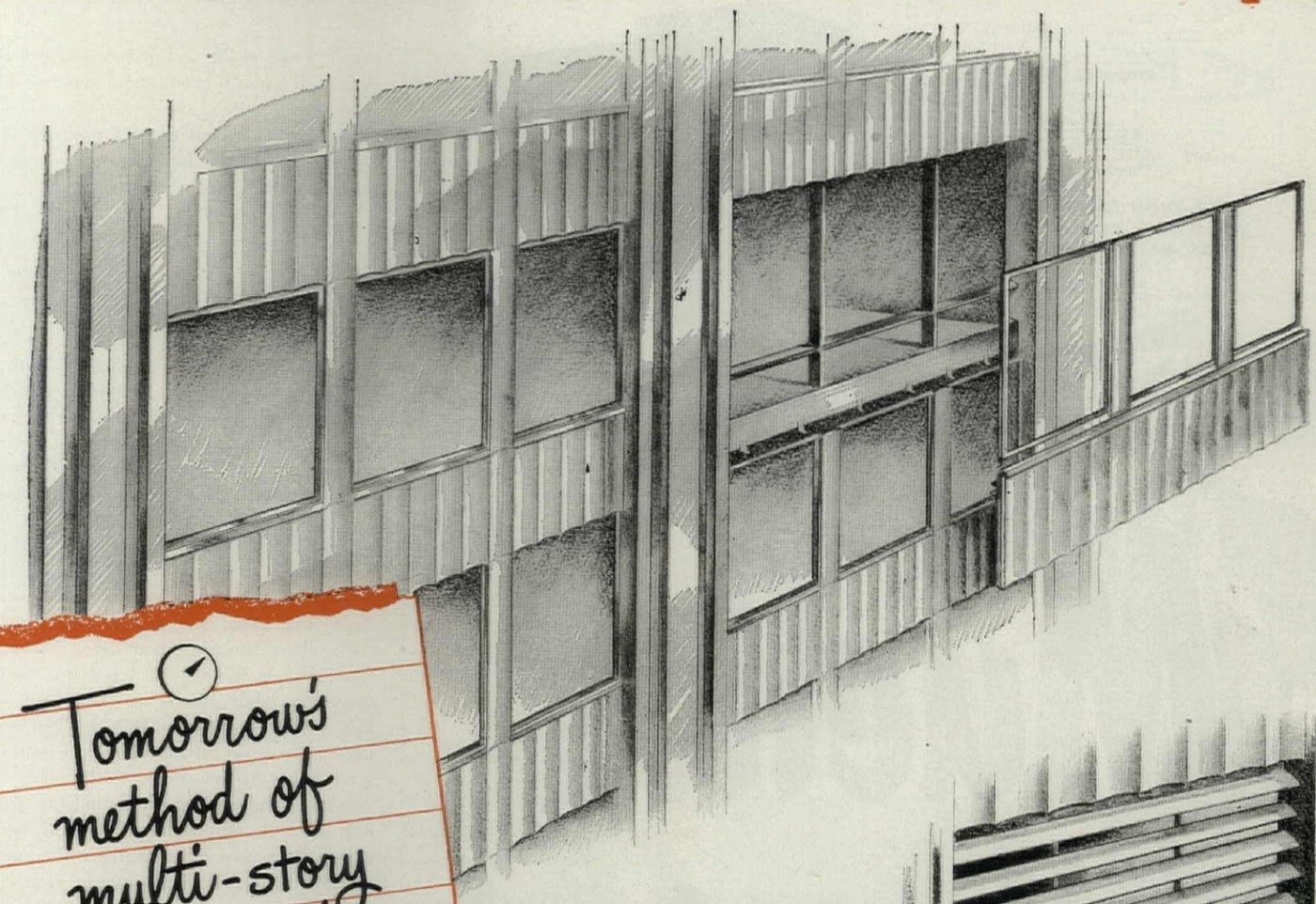
The famed "Heliolab" of S. C. Johnson & Son, Inc., Racine, Wisconsin
Architect: *Frank Lloyd Wright* Resident Engineer: *John Halama*
General Contractors: *Wiltscheck and Nelson, Inc.*
Consulting Mechanical Engineers: *Samuel R. Lewis & Associates*

York refrigeration air conditioning

The big advances come from YORK

Headquarters for— **Refrigeration and Air Conditioning**

notes from the architect's sketch pad

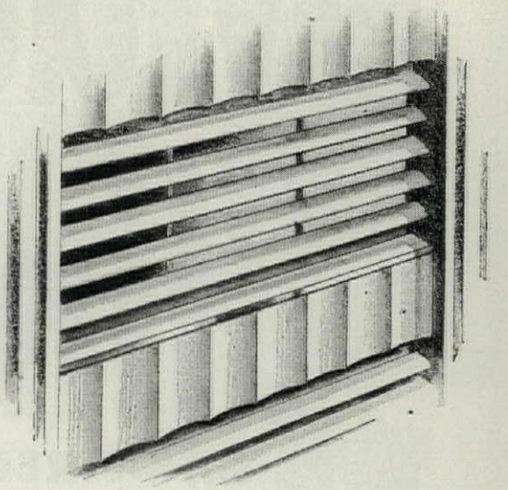


Tomorrow's method of multi-story construction

WITH U·S·S STAINLESS STEEL

▲Typical section of a building utilizing Stainless Steel curtain wall construction. "Exploded" portion shows how Stainless spandrel and Stainless window section go into the structural steel framework as a unit.

Another view of a similar window section that makes use of Stainless Steel solar shades to control sunlight and heat.



CURTAIN wall construction that takes full advantage of the benefits of U·S·S Stainless Steel is worth careful consideration in your future planning.

These sketches suggest how attractive, functional designs may be achieved by utilizing flat, fluted or corrugated Stainless Steel surfaces, or by alternating Stainless sections with pilasters of Porcelain-enameled Steel.

In addition to its truly modern appearance, curtain wall construction of Stainless Steel offers important savings in weight, savings in space, and savings in maintenance costs that no other material can equal.

• • •

From time to time, we'll show you ideas in Stainless curtain wall construction. Add them to your planning file and write for our booklet, "Steel Exteriors for Multi-story Buildings." It answers many questions concerning tomorrow's method of multi-story construction. Send your request to United States Steel Corporation Subsidiaries, Room 4255, 525 William Penn Place, Pittsburgh 30, Pa.

AMERICAN STEEL & WIRE COMPANY, CLEVELAND · COLUMBIA STEEL COMPANY, SAN FRANCISCO
NATIONAL TUBE COMPANY, PITTSBURGH · TENNESSEE COAL, IRON & RAILROAD COMPANY, BIRMINGHAM · UNITED STATES STEEL COMPANY, PITTSBURGH
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U·S·S STAINLESS STEEL

SHEETS · STRIP · PLATES · BARS · BILLETS · PIPE · TUBES · WIRE · SPECIAL SECTIONS

1-745

UNITED STATES STEEL



Type 150 Suspended Unit Heater — propeller fan type; 60,000 to 150,000 Btu capacities; shipped assembled and pre-wired. AGA and UL approved.

Mueller Climatrol

GAS-FIRED UNIT HEATERS

—save costs in many ways

For an independent heat source when plant expansion exceeds steam capacity, or for a compact, efficient heating system in new construction where time and costs are vital factors — the Mueller Climatrol unit heater line supplies the perfect answer!

Here are a few of the many savings they offer:

- ***Installation Cost is Low*** — shipped pre-wired, completely assembled . . . just hang, connect to gas and power lines and vent. No special chimney needed.
- ***Operating Cost is Low*** — efficient horizontal design assures maximum heat extraction, minimum fuel costs.
- ***Maintenance is Easy*** — can be completely cleaned and serviced from below without lowering the unit.

When you think of space-heating think of Mueller Climatrol. Capacities to fit any job you have. Write for complete information . . . *L. J. Mueller Furnace Co., 2020F W. Oklahoma Avenue, Milwaukee 15, Wis.*

B-56

Capacities and Types for Every Job



Blower Type 151 — Four sizes; 60,000 to 150,000 Btu input; all welded, horizontal design; AGA and UL approved. Shipped assembled and pre-wired.

Floor Type UH — nine sizes: from 180,000 to 540,000 Btu input in 45,000 increments; AGA approved. Easy to assemble and install.



94th Anniversary

Mueller Climatrol

FOR GAS FOR OIL FOR COAL

LETTERS—WASTE IN BUILDING

m.p.h. winds at 20° below zero *and* less stubborn insistence upon 8″ reinforced concrete basement walls.

We have applauded your program from the beginning. It is the best news in the construction business in 40 years.

E. L. Graves
Seward, Alaska

Labor and waste

Sirs:

. . . I agree with everything set forth in your article on waste and hope for the day when we can see some uniformity in various city and state regulations and some correction of the utter inconsistency prevailing in some FHA requirements. I also feel that if housing structures were designed with some consideration for economy we could do a better job faster and probably more appealing.

As new building materials are developed, it seems that labor unions band together to offset the savings brought about by a better product which can be installed in less time. Some of our carpenter labor unions here forbid a carpenter using a factory-made miter box. They must fashion one of wood on the job—none of this taking a miter box from one job to the other.

While I have always felt that our houses are over-strength and economies could be effected without sacrifice of strength, utility and architectural appeal, I am wondering what effect this revision of our building codes would have on the unscrupulous contractor that adheres to the bare minimum and comes up with a questionable structure. How are we to prevent such an operator from taking still further advantage of more liberal building codes from really fleecing the public? Maybe here we can work on the admonition or principle of "the greatest good for the greater number" and let those borderline cases take care of themselves. . . .

Henry S. Parks
Salt Lake City, Utah

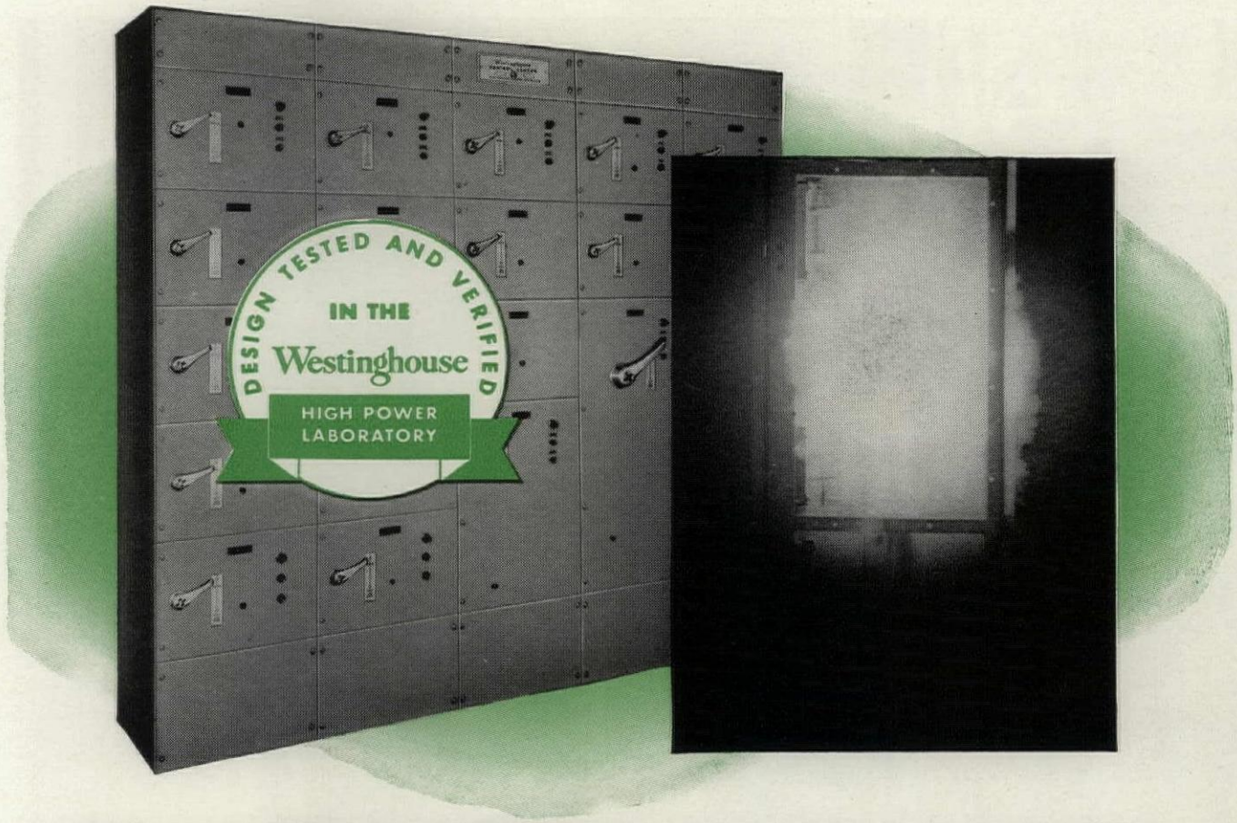
Sirs:

Your efforts to reduce building costs are very commendable. . . .

My experience over a period of 40 years indicates that the primary factor in the high cost of building is labor, both direct in construction and indirect in all the materials used. These labor costs may be resolved into three phases, cost per man-hour, man-hours worked (actually) and work done per hour. These aspects of production costs apply not only to construction but to every article of material used in building.

As an example, in 1915 I was connected with a building operation in which the brick cost $10 per M, the bricklayers worked 10 hours per day, took pride in their workmanship, made $9 per day and laid from 2,500 to 2,800 per day. These wages enabled them to live on just as high a plane, relatively, as such workmen enjoy today, and they were happier than workers of today.

(Continued on page 60)



What other control center gives you this

TESTED PROTECTION

Your control center holds the life line to your motors. Such guardianship demands top-quality construction, at *every* point, to provide complete protection.

Westinghouse Control Centers are built to give you this protection and laboratory tested to prove it:

1. **Complete Baffling** of each starter unit in Westinghouse Control Centers is a typical example of the fruits of this thorough testing at the Westinghouse High Power Laboratory. When interrupting a short circuit on a starter unit of non-baffled design, tests showed the short circuit could spread throughout the entire structure. Each Westinghouse starter unit is completely baffled to prevent these explosive chain reactions. Unusual arcing is localized if faults occur.

2. **Ample Interrupting Capacity** is another tested feature of Westinghouse Control Centers. Each starter circuit breaker has a capacity of interrupting a fault current of not less than 15,000 RMS amps.

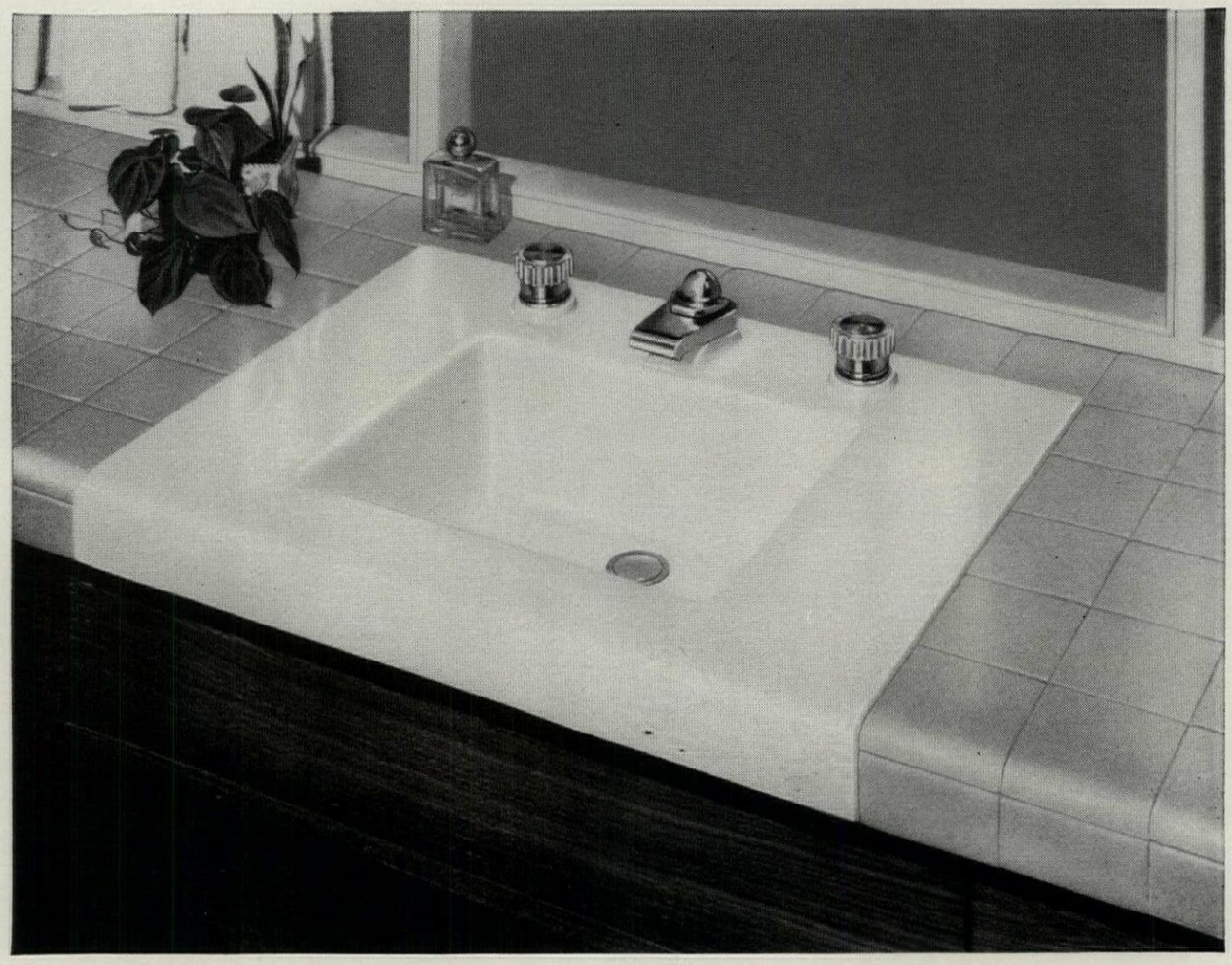
3. **Sturdy, Self-Supporting, Tight Structures** also are on the list of Westinghouse quality features. Each panel is built to stand by itself and to protect the internal electrical equipment.

You will want to know of the many other points of quality that make up Westinghouse Control Centers. Write for your copy of Booklet B-4213 which contains all the facts. Westinghouse Electric Corp., P. O. Box 868, Pittsburgh 30, Pa.

J-27010

YOU CAN BE SURE.. IF IT'S
Westinghouse

CONTROL CENTERS



*Award Winner... "for excellence in design"**

THE CRANE CRITERION LAVATORY

**The Annual Gold Medal Award of the Architectural League of New York "for excellence in design of industrial products for architecture" was awarded to Henry Dreyfuss, noted industrial designer for his design of the Crane* Criterion *Lavatory.*

Crane leads again with the award-winning *Criterion* counter-top lavatory. This new idea in bathroom fixture styling is typical of Crane progress—and one reason why Crane is the "*Preferred Plumbing.*"

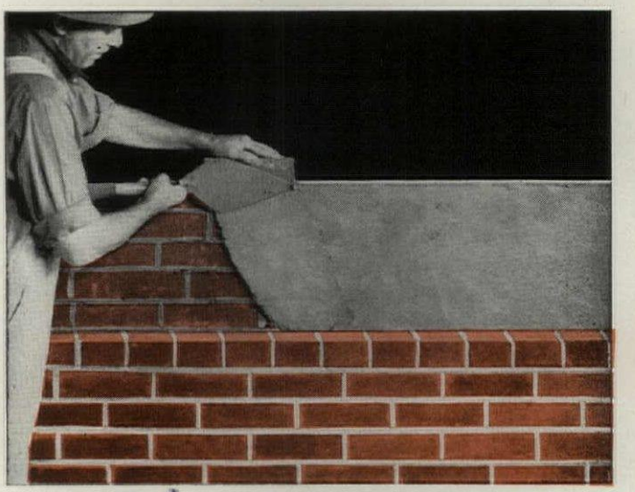
The Crane *Criterion* lavatory is solid slab vitreous china in white or a choice of eight Crane colors. Designed for installation in a counter-top or as a free-standing unit. The spacious rectangular basin has the overflow at front. The smart new *Criterion* trim is brush-finish chromium with clear lucite handles and exclusive *Dial-ese* controls that operate at finger-tip pressure. Size overall: 30¼ x 22 in. Basin: 16 x 12 in. See the Crane *Criterion* lavatory at your Crane Branch or Crane Wholesaler. For sale by Crane Dealers.

CRANE

CRANE CO., GENERAL OFFICES:
836 S. MICHIGAN AVE., CHICAGO 5

VALVES • FITTINGS • PIPE • PLUMBING AND HEATING

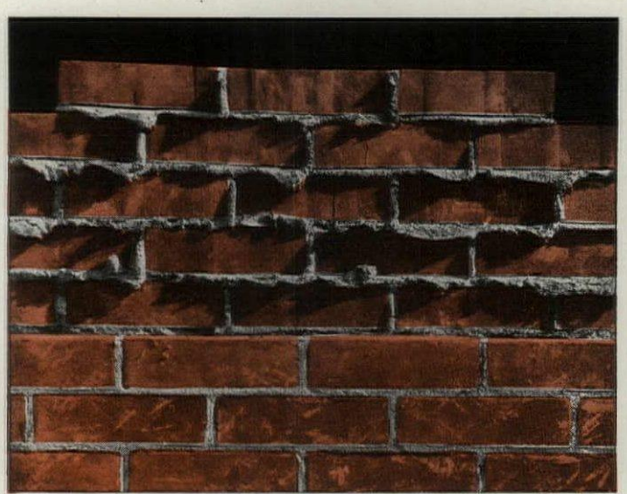
GOOD BRICKWORK = GOOD DESIGN + GOOD WORKMANSHIP + GOOD MATERIALS



The face brick should be backplastered.



If the back-up units are laid first, the front of the back-up units should be plastered.



Backplastering should not be attempted over protruding mortar joints.

PARGING

WITH

BRIXMENT

HELPS ASSURE

DRY WALLS

WE SUGGEST THAT—

The face brick should be backplastered with not less than ⅜ of an inch of mortar before the back-up units are laid.

Or, if the back-up units are laid first, the front of the back-up units should be plastered with not less than ⅜ of an inch of mortar before the face brick are laid.

Heavy rains don't make brick walls leak — they merely reveal the fact that the walls contain voids or passages through which the water may penetrate.

Dry brick walls are primarily the result of good design and good workmanship. Good materials are important, but still secondary. The more *plastic* the mortar used, the easier it is for the bricklayer to deliver good workmanship.

The photos at the left show some points of *good workmanship.*

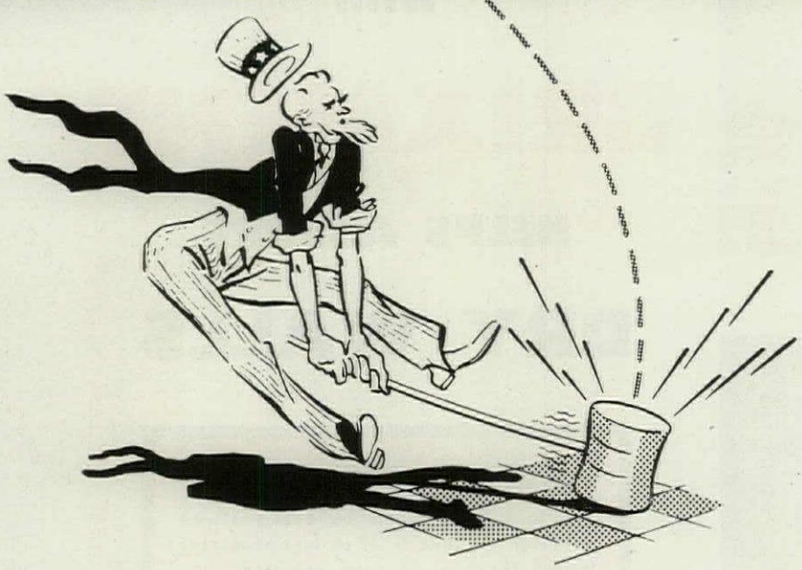
Brixment mortar has greater plasticity, higher water-retaining capacity and better bonding quality. Because of this *combination* of advantages, architects, contractors and dealers all over America have for thirty years made Brixment the largest-selling mortar material on the market. Why not try it yourself?

LOUISVILLE CEMENT COMPANY, Incorporated, LOUISVILLE, KENTUCKY

WRIGHT RUBBER TILE

EXCEEDS

GOVERNMENT SPECIFICATIONS



There is a big difference in rubber tile. Some makes last much longer than others. Some resist damage and chemicals better. Some tiles fade and some do not. Some are much easier to maintain than others.

But you can't always *see* these differences by looking. That is why the U. S. Government set up specifications for rubber tile used in government installations.

It is important to know that Wright Rubber Tile has always equalled or exceeded government specifications in every way.

The only way you can be *sure* of getting a good installation of rubber tile is to use specifications. You can find good, safe specifications in the Wright Architects' Bulletin, section 13H/Wr of Sweet's 1951 Architectural File. Use them to be sure of a good flooring installation.

WRIGHT MANUFACTURING CO.
5204 Post Oak Road • Houston, Texas

WRIGHT RUBBER TILE

2779

FLOORS OF DISTINCTION

- WRIGHTEX — Soft Rubber Tile
- WRIGHTFLOR — Hard Surface Rubber Tile
- WRIGHT-ON-TOP Compression Cove Base

LETTERS—WASTE IN BUILDING

The standard wage at that time was $5 but the brick laying was done under a voluntary agreement on a basis of per thousand laid.

I think the attitude of most labor at present is to work as little as possible, as short a time as possible and get as much pay as possible. This is not due to the workers themselves but to a long indoctrination by their leaders.

Formerly workers took pride in being able to do more and better work than less skilled men. Today the most capable seem to be held down to the production level of the least skilled.

In those days we considered that the cost of a house was 40% labor and 60% material. Today, it has been estimated that direct and indirect labor amounts to over 80% of building costs, and that in spite of a much higher mechanization of building tools.

Reduction of building costs depends more on labor than any other factor.

D. R. SHEARER
Johnson City, Tenn.

Springy floors

Sirs:

I disagree with the proposal to design for a minimum floor load of 10 lbs. and that the rocking of his home doesn't bother a man when he walks across the floor. I never was a good sailor and we also like to dance. . . .

RALPH M. LEAKE
Ashland, Va.

Toward suburban slums

Sirs:

I am astounded and discouraged that anyone supposedly sincerely interested in the field of building could seriously advocate such drastic lowering of construction and design standards. Such lowering will *not* produce better houses. If the present construction standards of speculative house builders are going to produce the suburban slum districts of a decade hence, as I believe they will, standards such as you propose will create them immediately. I accuse THE MAGAZINE OF BUILDING of the grossest insincerity to the building profession.

Among the statements to which I take specific exception are the following:

1) "You can get very adequate thermal comfort with the so-called space heater." I don't believe it.

2) "Sheathing is practically useless." In this climate you'd be damned glad of it.

3) "Unrealistic standards as a 40 lb. live load on floors, a 20 to 30 lb. wind load, and a 30 lb. snow load. . . . The possessions which we have . . . indicate that the design load for that phase is actually somewhere in the neighborhood of 5 lbs. per sq. ft."...

I know of a new house near here, presumably designed to the code limit of 30 lbs., in which the kitchen partially cantilevers beyond the basement wall. When the refrigerator was installed and the cupboards filled, the cantilever sagged.

(Continued on page 64)

How to **plan on tomorrow's piping**

a proper fitting for every copper drainage connection



Here is a representative assortment of cast bronze solder type drainage fittings for every kind of soil, waste and vent connection with ANACONDA Type M Copper Tubes.

Here are the big reasons why ANACONDA Type M Copper Tubes and Cast Bronze Fittings will make the best drainage installations:

- **Solder joints are easier, cost less, to make.**
- **Less danger of clogged lines because of smooth bore.**
- **Light weight permits prefabrication of assemblies. A complete copper drainage system weighs only about one fourth as much as one of steel and cast iron.**
- **Copper tubes and fittings require less space. (A 3" diameter vent or soil stack can be installed in a stud partition of standard width.)**
- **Standard twenty-foot lengths reduce number of joints.**

For a catalogue or other information on ANACONDA Copper Tubes and Fittings for drainage, water, or heating lines; write to The American Brass Company, Waterbury 20, Connecticut. In Canada: Anaconda American Brass Ltd., New Toronto, Ontario.

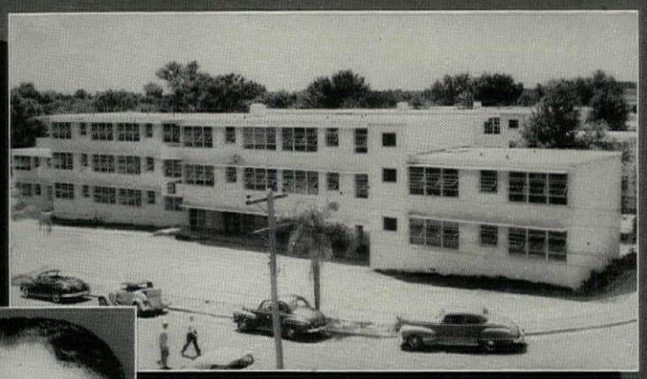
6102



nothing serves like **ANACONDA®** **COPPER TUBES**

Famous Contractors Approve when The THORO System Products are— *Specified*

Here's what John F. Templin, outstanding General Contractor, Lakeland, Florida, has to say . . .



Showing 1 of 18 buildings constructed for Lakeland's Florida Southern College. All with Thoroseal on exterior surfaces. John F. Templin, General Contractor.



John F. Templin

TEMPLIN'S, INC.
General Contractors
940 East Main Street
LAKELAND, FLORIDA

Mr. Bert J. Long,
Standard Dry Wall Products,
New Eagle, Penna.

November 16, 1950

Dear Mr. Long:

Prior to 1944 we tried numerous kinds of materials for waterproofing masonry construction. Since we began using Thoroseal and Quickseal six years ago we have been entirely satisfied. Not only have all of our applications been highly satisfactory, but their use is economical.

Your distributor for central Florida, Mr. Thomas N. Morrison, Lakeland, has proven himself to be as reliable in representing your merchandise as are the products themselves.

On the basis of our experience with Thoroseal and Quickseal we gladly recommend them for waterproofing and for beautification.

Sincerely Yours,
TEMPLIN'S INC.,
By John F. Templin

JFT-k



Thoroseal Protection, Architect, Frank Lloyd Wright, General Contractor, John F. Templin.

"Weathering the elements of Florida has been a continuous battle for years for most contractors in a climate of heavy rains, boiling sun and hurricane winds. That's why you'll find leading builders recommending the famous Thoro System Products. For over 39 years, these materials have been given a rugged test that shows them tops on most home builder's programs."

"The range of colors and the lasting brilliance of Thoroseal and Quickseal makes them a number one sales feature for the contractor who emphasizes quality at minimum cost."

39 YEARS OF SOUND BUSINESS REPUTATION

EXPERIENCE, in the preparation of materials for masonry protection and maintenance,—in every case means, success or failure!

With THORO System Products, the designer secures 100% protection by complete sealing of the surface, combined with exceptional beauty and color.

Write today for our new 20 page brochure 17-A and designer's wall chart.

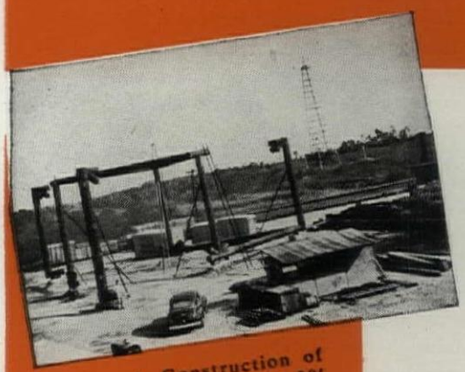


Standard Dry Wall Products

NEW EAGLE PENNSYLVANIA

Raymond conquers *chubascos*... in THE WORLD'S MOST UNUSUAL SOIL BORING JOB

FOR VENEZUELAN OIL CONCESSIONS, LTD.,

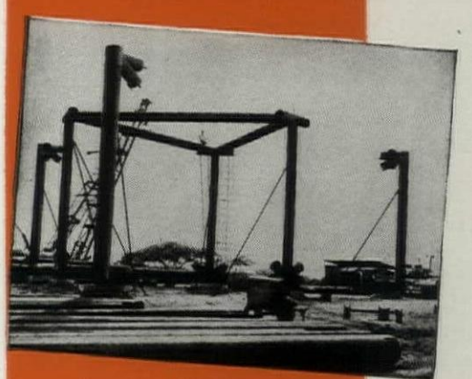


1. Construction of pipe frame float 30' high, 80' long on each side of the triangle.

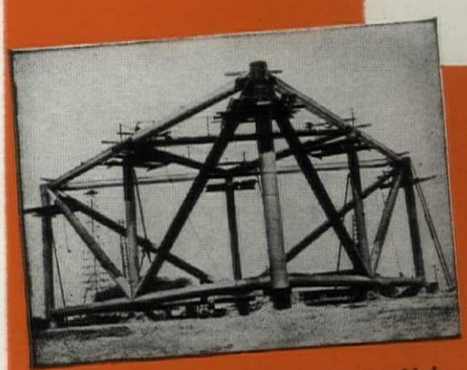
The Problem: 250-foot Gow soil borings, accurately spotted five to ten miles offshore in the deep waters of Lake Maracaibo, Venezuela. The Project: pile foundations for future oil-well derricks. Special Hazard: 70-mile-an-hour "chubascos," violent squalls that would wreck temporary platforms.

The Solution: Raymond engineers designed a triangular *floating* platform of 22″ steel pipe, welded and watertight. The three corner members were left open for 120-foot-long anchor spuds. Assembled on shore from steelwork fabricated in New York, the 60-ton float was skidded onto two barges and towed 32 miles to the first boring location where floating derricks launched it. Spuds and deck equipment were placed later, including winch-controlled anchors at each corner to help in spotting the float and holding it steady during boring operations.

The Moral: When the problem is tough, the answer must still be *right*. That's when it pays to have a resourceful, experienced organization on the job . . . like Raymond!



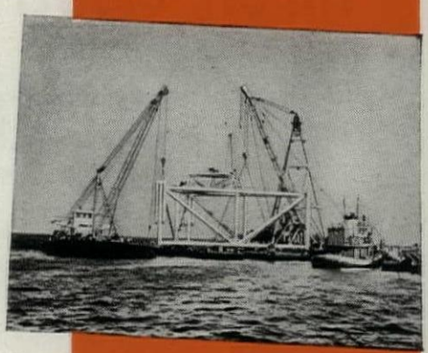
2. Closer view of the starting framework, showing 22" diameter steel pipe being used.



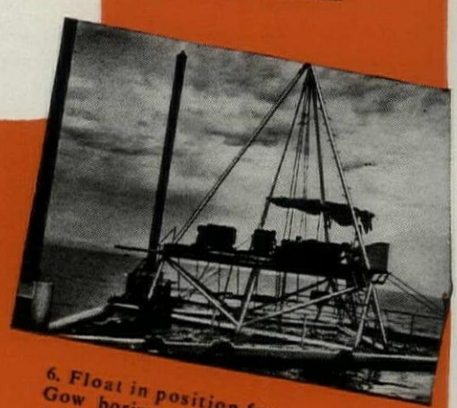
3. Completed framework, welded and watertight except for the corner verticals, which will accommodate anchor spuds.



4. Floating derricks preparing to lift the float from barges and place it in the water.



5. Launching the 60-ton float. Note work platform erected 10 feet above framework.



6. Float in position for Gow boring operations, anchored by the 120' spuds and cables at each corner.

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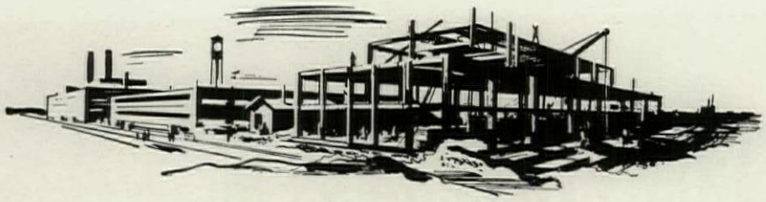
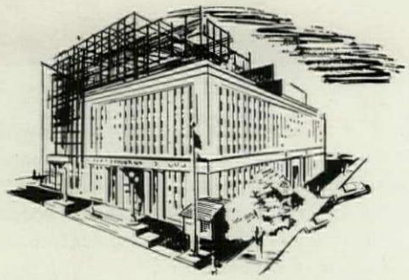


Defense plant expansion or reconversion



Hospital and laboratory construction



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1 A nation-wide warehouse system that often anticipates and forestalls local shortages before they become critical.

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LETTERS—WASTE IN BUILDING

The water in a bathtub filled 1′ deep weighs 625 lbs. That is 50 lbs. a sq. ft. over the area of the tub, and does not include the weight of the tub or the bather.

We have been blessed with a fair amount of snow here this winter, and we could show this panel of distinguished experts several roofs, all designed for 30 lbs., which have collapsed. Snow may be light, but ice is almost as heavy as water.

4) "We could very well rule out all ceiling (light) fixtures. . . . A wall plug with a switch at the door is a luxury." . . . Unless you have some form of built-in overall illumination, the room lighting is totally inadequate. . . .

I can buy three built-in fixtures for $42, but one floor lamp costs $60. Furthermore, I dislike cords, extension cords, plug and socket connections, and whatever, running all over the room. We undergo these damned nuisances just because the architect or contractor considers built-in fixtures superfluous. I consider them not only desirable, but absolutely necessary—in every room in the house including closets. . . .

The panel of experts failed to mention possible methods of cutting costs without cutting standards. . . . Nothing was said about prefabrication or about the restrictions imposed by labor. . . .

The large implications of your proposals in this Round Table report are extremely disheartening.

SAMUEL B. MAYO
Minneapolis, Minn.

Saving through prestressing

Sirs:

I have read with extraordinary interest the Round Table report in the March issue. There is no question but that the leaders of this industry would like to improve it by modular standardization, a national uniform building code and all of the other efficiencies which could be achieved. My conclusion from this reading is that the only way it can be done without waiting another 50 years is for the U. S. Government to establish a coordinator with sufficient powers to force this economy through.

One of the items receiving particular attention is that of steel saving. Suggestions were made to raise the permissible working stress to 24,000 p.s.i. This is something, but why not be a little braver and suggest some immediate large-scale tests to be sponsored by the Government—they could be made at the Bureau of Standards—on the use of prestressing. By using working stresses of 100,000 p.s.i. or better, we can save 80% of most of the steel needed in reinforced concrete construction. This steel costs more than ordinary mild steel, yet there is a great saving in dollars and, of course, the saving of the material at this time is even more important than dollars.

I have just designed floor and roof slabs for a building for the Institute of Inventive Research at San Antonio, Texas, and found that for 52′ column spacing, the slab thickness need be only 10″. This is a flat slab; there are no beams and

(Continued on page 68)

Compare it from any angle!

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- ✓ CONSTRUCTION
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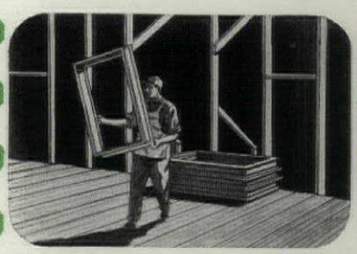
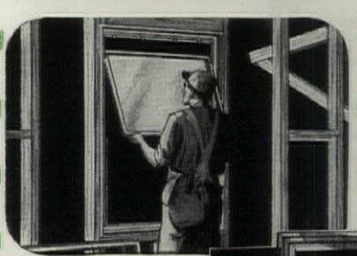
Completely Installed in 5 minutes!









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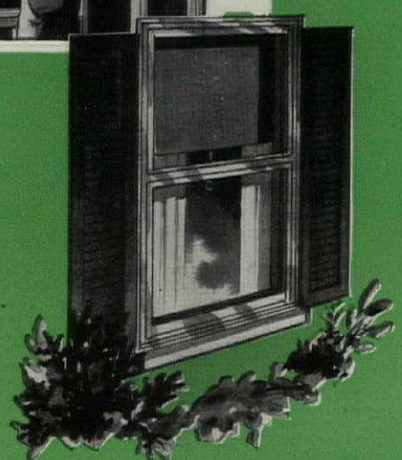
Panels easily removed from inside



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So when you're planning, be sure to consult with your local distributor of Acousti-Celotex products. He's backed by the world's most experienced Sound Conditioning organization, with thousands of actual installations to its credit. His expert cooperation and service can help you be sure—*in advance*—of the most effective, most attractive installation possible!

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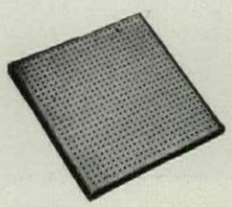
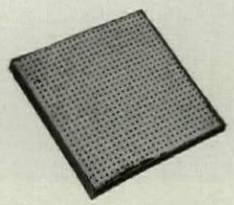


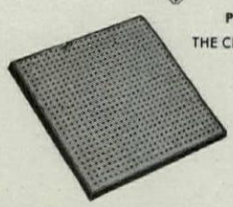
ACOUSTI-CELOTEX* CANE FIBRE TILE

A lightweight, rigid unit, combining acoustical efficiency with a durable, smooth surface. Perforations (to within ⅛" of the back) assure repeated paintability, easy maintenance. Available in a variety of sound-absorbent ratings. Dry rot proofed by exclusive Ferox* process.



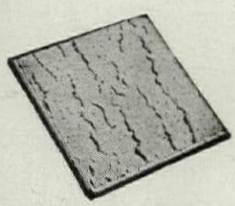
ACOUSTI-CELOTEX* MINERAL TILE

Made of mineral fibre, felted with a binder to form a rigid tile with a universal rating of incombustibility. Perforated with small holes extending almost to the back, this tile provides high acoustical absorption plus unrestricted paintability by either brush or spray method.



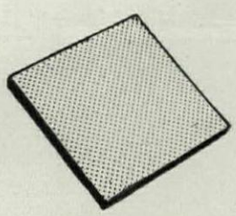
ACOUSTI-CELOTEX* FLAME-RESISTANT SURFACED TILE

A cane fibre tile with a flame-resistant surface. This tile meets *Slow Burning* rating contained in Federal Specifications SS-A-118a. It may be washed with any commonly used solution, satisfactory for good quality oil-base paint finishes, without impairing its flame-resistant surface characteristics and without loss of sound-absorbing capacity. Repainting with Duo-Tex flame-retarding paint will maintain peak flame-resistant efficiency. Supplied in all sizes and thicknesses of regular cane tile.



ACOUSTI-CELOTEX FISSURETONE*

A totally new mineral fibre acoustical tile. Attractively styled to simulate travertine. It beautifies any interior and effectively controls sound reverberation. Lightweight, rigid and incombustible, it is factory-finished in a soft, flat white of high light-reflection rating.



ACOUSTEEL*

Combines a face of perforated steel with a rigid pad of sound-absorbing Rock Wool to provide excellent sound-absorption, together with attractive appearance, durability and incombustibility. The exposed surface of perforated steel is finished in baked-on enamel. Acousteel is paintable, washable, cleanable.

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Heads the list of more and more careful home buyers!

Today's value-conscious home buyer is mighty choosey in selecting equipment for his new home. He looks for brand names he *knows* —names he can *depend on* for quality and lasting satisfaction. In heating equipment, that name is Timken Silent Automatic!

That's why so many leading architects and builders make it standard practice to install Timken Silent Automatic Heat! They profit directly from the 25-year reputation of this foremost automatic heating equipment—a reputation constantly being enhanced by hundreds of thousands of satisfied users. Be sure you'll profit from all the *multiple plus values* of Timken Silent Automatic Heat in the next homes you build. Write today for full details and performance data!

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COMPACT DESIGN—Skillful engineering holds required floor area to a minimum.

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- Resistant to stains, scratches and water.
- Easy-to-install and simple-to-clean.
- Years of lasting beauty.
- Economical, durable and resilient.

PARQUETRY is winning wider favor with architects and builders everywhere. In office buildings, housing units, and homes, it's always in good taste with any surrounding. It's different—it's new—and it's the hardwood floor effect at the cost of asphalt tile. PARQUETRY has universal appeal—an appeal that adds dignity to any room with modern or period furnishings. The rich natural oak appearance will match any architecture with no fear of color-clashing. You give home owners an inexpensive luxury when you specify PARQUETRY for an extensive renovation or a complete new home. This PARQUETRY asphalt tile is factory-waxed for lasting beauty and accurately sized for effortless installation. Make the switch to PARQUETRY, when hardwood effect is desired at the cost of asphalt tile.

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LETTERS—WASTE IN BUILDING

no column heads. This building will be built forthwith *if* the prestressing jacks can be obtained in time.

Of course, prestressing is relatively new. Generally speaking, it has been used only for bridges and long span girders. They have now been in use for about 15 years and stand up excellently. There is no reason for not using it in ordinary building construction except lack of engineering knowledge. The main reason for this is that the original prestressors have written books with formulas so complicated that they have been up in a cloud as far as most engineers are concerned. . . . This being so, I took it on myself to reason out a very simple method for figuring prestressed concrete—so simple that any engineer in any office can figure the stresses with accuracy. This was presented in the October issue of the American Concrete Institute Journal. . . . I am not particularly advocating my method of prestressing, even though naturally I consider it the simplest, but what I am emphasizing is the method of calculation shown in this paper which can be applied to any kind of prestressing. . . .

Architects would in many cases welcome the possibility of having 50′ spans instead of 24′ and this, of course, would be of particular interest as regards industrial plants.

K. P. Billner, *President*
Vacuum Concrete, Inc.
Philadelphia, Pa.

New lumber standards

Sirs:

You are rendering the construction industry and the buying public a great service. . . .

Riverside County does not have a building code, and several years ago I built a small home for a widow with a very small amount of money to spend, in County territory. All walls including the exterior were 2 x 3 studs 24″ oc and were plastered inside with siding outside. The place has stood up well. . . .

More power to you. . . .

William O. Dawson, *Builder*
Riverside, Calif.

Sirs:

I don't agree on 2″ x 3″ joists as this is not in conformance with the suggested 4″ modular coordination. . . .

Modular coordination is definitely the answer to the manpower shortage and should not only be recommended but made compulsory. . . .

Being in the electrical field I can well agree with the suggestions of low voltage control. This is not only a convenience, but a great savings on copper. . . .

The FHA is the worst offender of all. They check the little things but the major items which save money and time are winked at. . . .

Donald Grover
Poland, Ohio

(Continued on page 74)





Looking for resilient floor coverings that outlast others and cost less to maintain? That's what you get from flooring materials based on VINYLITE Brand Resins.

Proof of this is their ever-growing use in heavily-trafficked school cafeterias, factories, hospitals, restaurants, offices, public buildings—wherever wear and tear and care are serious economic problems under rigid budgets.

Available in virtually any color—including some that are clearer and brighter than ever before possible in resilient floor coverings—these economical materials resist water, soaps, cleansers, foods, grease, oil, even acid and alkali solutions. They are flexible, conforming to uneven floor surfaces and absorbing normal play of wood floors without cracking. They can be safely laid on concrete floors in direct contact with the ground.

And more about *care:* Waxing gives them unmatched luster, yet it is not needed on their glossy, non-porous, dirt-shedding surfaces. Budget-minded? Better let us send you a list of suppliers of floor covering based on VINYLITE Brand Resins. Write Dept. KM-14.

Data on "Flexachrome" Floors Courtesy The Tile-Tex Division, The Flintkote Company, 1232 McKinley St., Chicago Heights, Ill.



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how MOSAIC tile helped make

THE PACESETTER HOUSE OF 1951

a spectacular success

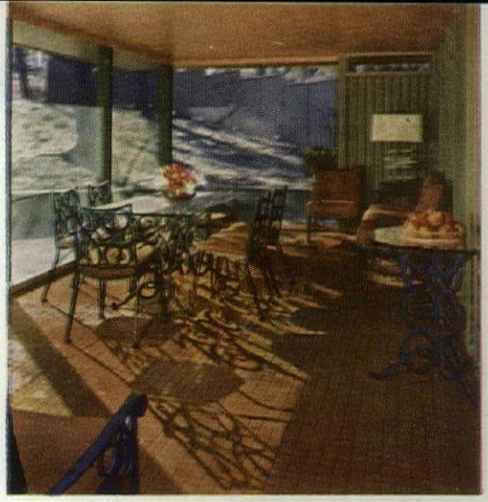
The editors of "House Beautiful" have pioneered some unusually practical uses for Mosaic Tile in their *Pacesetter House for 1951.*

Architect—Julius Gregory
Builder—Robert Chuckerow Construction Company
Tile Contractor—R. L. Leonardi, Inc.



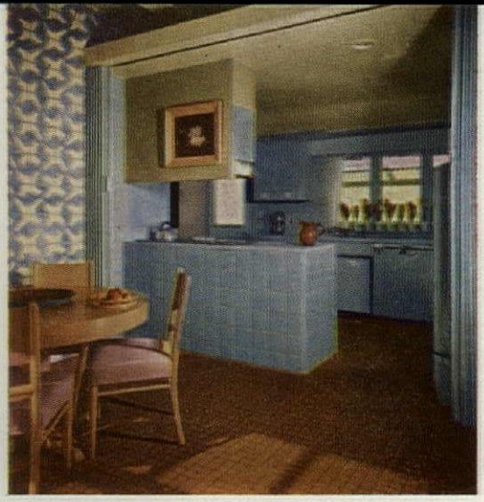
The "House Beautiful" Pacesetter House of 1951, at Dobbs Ferry, New York.





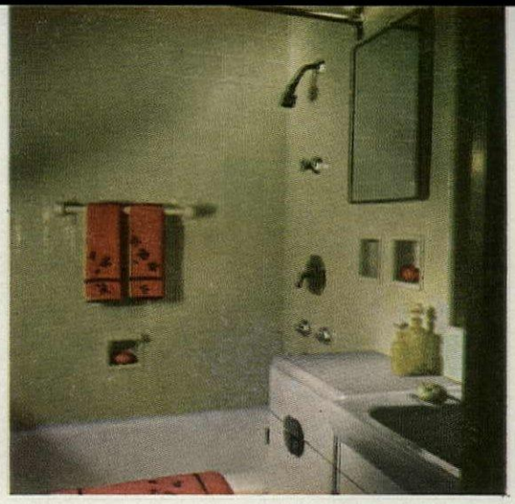
IN THE OUTDOOR living room the rich, earthy, red of the Mosaic Granitex Tile floor blends perfectly with its garden setting. Continuous traffic from the garden areas across this floor will never mar its surface or texture. Neither sun nor weather will change its permanent color. This floor may be hosed daily, for Mosaic Tile is impervious to moisture and stains.

Floor—Granitex Mosaic, Pattern No. 1779-A3.



BLUE FAIENCE TILE is an ever-beautiful finish on the sides of this combination serving bar and cooking peninsula. The hand-crafted-appearance of Faience aids in blending the casual character of the living-dining area with the trim efficiency of this ultra-modern kitchen. Other types of Mosaic Tile are used on work counters, splash boards and walls for the utmost in easy cleaning and lasting beauty.

Peninsula—6" x 6" Faience color No. 2102.



MOSAIC TILE in this bathroom will turn in top performance for the life of the house because water and moisture will never effect the tile nor the manner in which it is set.

The vanity top and the floor are unglazed ceramics, an especially hard and durable type of Mosaic Tile, with permanent color throughout its wear-proof body.

Harmonitone wall tile color—No. 161.
Vanity top and floor color—No. 201 Velvetex.

From these pictures, you can visualize how Mosaic Tile, an extremely practical material —and used in every room in the *Pacesetter House*—may be used on both vertical and horizontal surfaces.

For example, Mosaic Faience Tile, which makes the fireplace wall so outstanding, offers opportunities of great interest if planned for elevator lobbies and for other large surfaces where everlasting beauty, utility and rock-bottom maintenance are required. For such uses, the cost of Mosaic Faience Tile will be no more than that of equally sturdy materials. *In fact, it will probably be less.*

There are other patterns you will want to see. Or, taking a clue from this job and from such other jobs as the ceramic Mosaic wall in Harvard University's recently completed graduate school, you may wish to develop your own design for the job you plan for Mosaic Tile.

In either case, Mosaic's Design Department is at your service. There is no obligation.

Center of attraction in *Pacesetter House* is this truly magnificent and really distinguished floor-to-ceiling fireplace wall, which serves also as a decorative partition between living and dining areas. Made of Mosaic Faience Tile, in a special design, its colors are there to stay; can't fade or bleach. Floor of living and dining area is Granitex Mosaic, which is also used on the floor of the outdoor living room.

—fireplace wall Mosaic Faience Tile, pattern No. 6056.

—floor Granitex Mosaic, pattern No. 1779-A3.

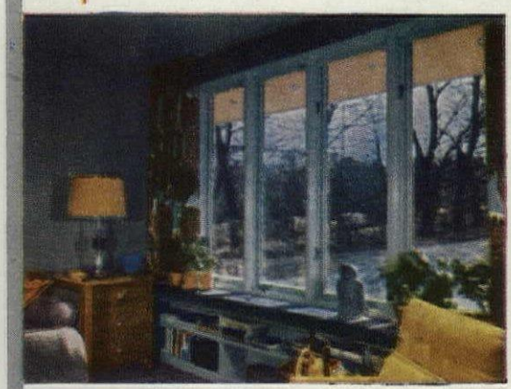
ON THE FLOOR at the windows in the master bedroom, Mosaic Faience Tile, in a delightful green, is used as an "indoor greenhouse." Here plants live in ideal atmosphere, on a floor that will never stain and which is so easy to clean.

Mosaic Faience Tile—Color No. 2164.



NO MATERIAL is more practical for window sills and window shelves. Here Mosaic Granitex are used as a broad under-window shelf—fine for plants, books, knick-knacks—an ideal combination of durability and decorative texture.

Shelf is Granitex Mosaic, color No. 1228.





THE DINING ROOM FLOOR is a continuation of the living room floor, a feature that contributes to the feeling of spaciousness which is apparent throughout the house.

Floor—Granitex Mosaic, Pattern No. 1779-A3.



THE PACESETTER HOUSE is open to the public until July 1. We'd like you to see it if you are in the East. It's at Dobbs Ferry, just up the Hudson River from New York.

Mosaic Tile offers a great deal to modern, contemporary design. No other material is more functional. No other material provides so much in color, long life or freedom from maintenance.

The Mosaic Tile Company offers freely of its assistance to those architects, builders and owners who want to investigate our products for their jobs. Ask any Mosaic representative or write Dept. 29-3, The Mosaic Tile Company, Zanesville, Ohio.

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Red Birch Flexwood. Hamburg Savings Bank, Brooklyn, N. Y.
Architect—Harold Carlson

How FLEXWOOD SOLVED

3 "LONG SURFACE" *problems . . .*

PROBLEM. To cover flat walls, square and round columns of two-floor height with decorative, dignified material that would create impressive yet friendly atmosphere.

SOLUTION. Skillful matching of Red Birch Flexwood sheets provides continuous, unbroken beauty on all "problem" surfaces. Columns handled as easily and handsomely as flat wall area.

SEND COUPON BELOW. See how Flexwood* helped solve 17 architectural problems.

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CHOICE WOOD IN FLEXIBLE SHEETS

United States Plywood Corporation
55 West 44th Street, N. Y. 18, N. Y.
In Canada: Paul Collet & Co., Ltd., Montreal

Flexwood is manufactured and marketed jointly by United States Plywood Corporation and The Mengel Company.

*Reg. U. S. Pat. Off.

← *Flat-Cut Walnut Flexwood.*

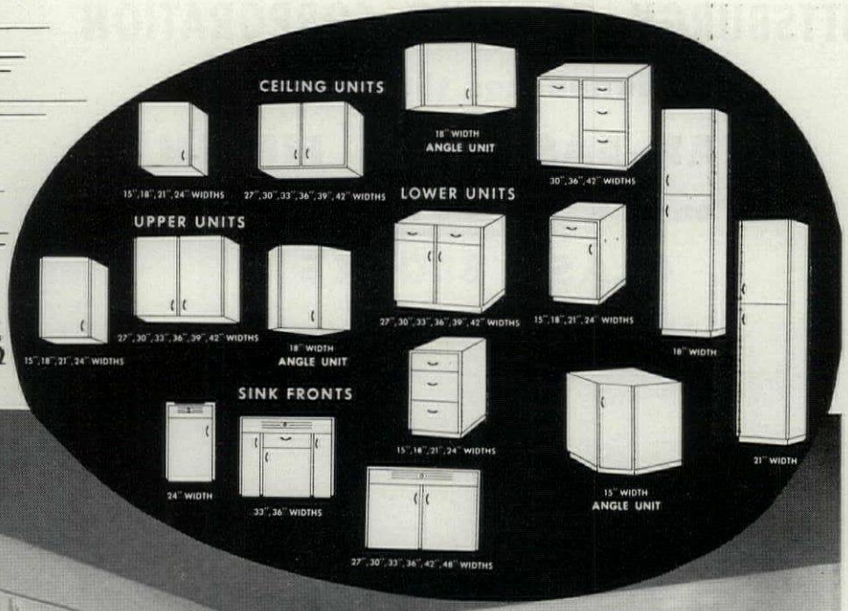
United States Plywood Corporation, Dept. W-7
55 West 44th Street, New York 18, N. Y.

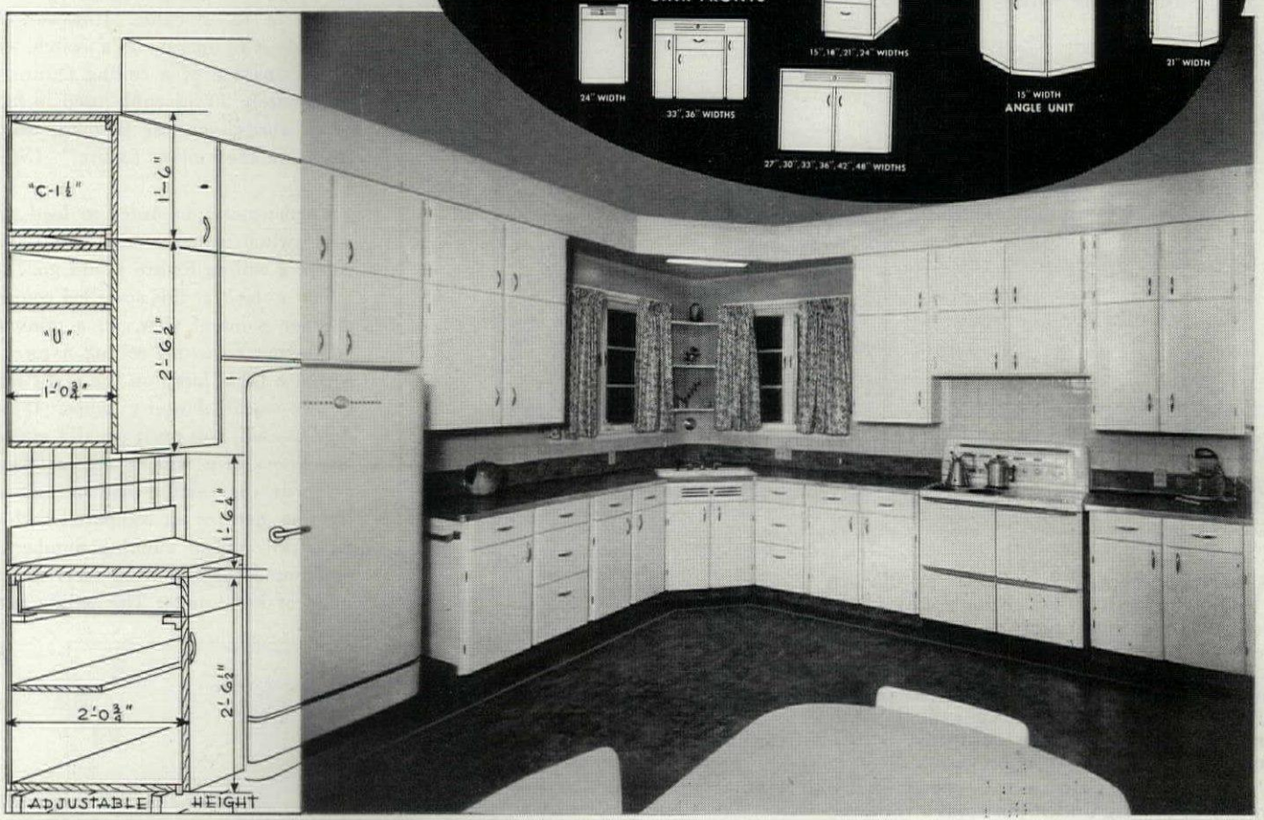
Please send me, without obligation, Flexwood's Case-History Book; shows how Flexwood helped solve 17 actual architectural problems.

NAME_____

ADDRESS_____

LEADING ARCHITECTS SPECIFY BILT-WELL NU-STYLE Wood CABINETS





ARCHITECTS: USE THIS SAMPLE SPECIFICATION:

Scope of Work:

All cabinets in the kitchen shall be Bilt-Well Nu-Style Cabinets as manufactured by Carr, Adams & Collier Co., Dubuque, Iowa.

Material and Workmanship:

These cabinets shall be constructed of clear Ponderosa Pine that has been kiln dried. All units shall be constructed in the following manner: Drawer Fronts dovetailed; Front Frame of case shall be mortised and tenoned; Shelves shall be dadoed into solid wood standards or sides and all these component parts shall be accurately machined to join one with the other.

Installation at Job:

The Carpenter-Contractor shall furnish and install an auxiliary base or toe space for Bilt-Well Cabinets. This shall be constructed of 1 x 4 material stood on edge. Same shall be set prior to the time cabinets are installed and must be set perfectly level. Shims between toe space and cabinets will not be accepted. All leveling must be done between the floor and the auxiliary base before cabinets are set into place.

Hardware and Accessories:

The following accessories have been selected from the manufacturer's catalog, but Carpenter-Contractor shall install in the cabinets at the job. Accessories: Metal rust-proof bread drawer, sugar and flour bins; pan and lid rack; knife and fork drawer, and carving board in the location indicated on Architect's Drawings.

Hardware: Shall be furnished by cabinet manufacturer. This installed in its respective location at the job by the Carpenter-Contractor.

BILT WELL WOOD WORK
REG. U. S. PAT. OFF.

CARR, ADAMS & COLLIER CO.

Dubuque, Iowa

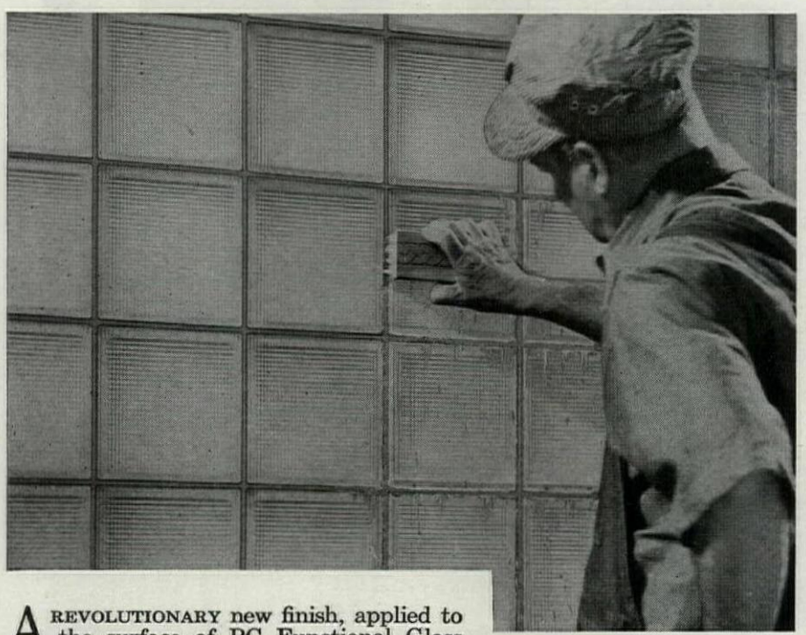
Manufacturers of the Famous Bilt-Well Line • *Mantels & Telephone Cabinets • Multiple-Use & Linen Cabinets • Stair Parts • Nu-Style Cabinets • Superior Unit Wood Windows • Exterior & Interior Doors • Entrances • Shutters • Clos-tite Casements • Carr-dor Garage Doors • Basement Unit Windows • Louvers & Gable Sash • Breakfast Nooks • Combination Doors • Screens & Storm Sash • Corner (China) Cabinets • Gli-dor Cabinets • Ironing Board Cabinets*

PITTSBURGH CORNING CORPORATION

announces the new

CLEAN-EASY FACE FINISH on PC FUNCTIONAL GLASS BLOCKS

to cut installation costs



A REVOLUTIONARY new finish, applied to the surface of PC Functional Glass Blocks during manufacture, repels water, prevents splashes of mortar from sticking to the block, prevents accumulation of installation scum. Therefore, finished panels can be cleaned much more quickly and easily, without excessive scraping, scrubbing, or the use of strong solvents.

This new development—proved by months of testing under the most strenuous service conditions—follows closely Pittsburgh Corning's introduction of brightly colored markings and "finger-feel" ridges to assure correct positioning of blocks. These practical improvements are saving all-important time and money on the installation of PC Glass Block functional fenestration.

When you are facing problems that concern making the most effective and economical use of natural daylighting, our specialists will be glad to consult with you. Just write to Pittsburgh Corning Corporation, Dept. D-51, 307 Fourth Avenue, Pittsburgh 22, Pennsylvania.

OTHER PC FIRSTS

1951— Clean-Easy Face Finish for reduced construction cost.

1950— "55" line functional patterns with brightly colored markings and "finger-feel" ridges for correct positioning.

1948— The Soft-Lite† Edge for optimum visual comfort.

1948— Orientation-keyed Prism Block design for automatic daylight control.

1941— Vue Block design for look-out vision panels.

1939— Double cavity patterns for extra insulation and diffusion.

1937— All-glass seal for structural reliability.

†T. M. REG. APPLIED FOR.

PITTSBURGH CORNING CORPORATION
PITTSBURGH 22, PA.

PITTSBURGH ® PC CORNING GLASS BLOCKS

The mark of a modern building

Distributed by Pittsburgh Plate Glass Company; W. P. Fuller & Co. on the Pacific Coast; Hobbs Glass Ltd. in Canada; and by leading distributors of building materials everywhere.

LETTERS—WASTE IN BUILDING

Less light, more cable

Sirs:

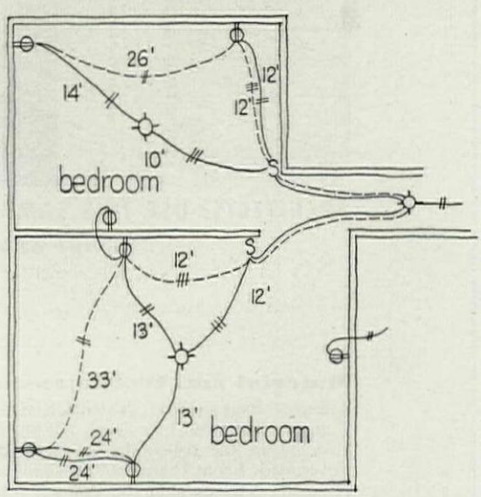
In your Round Table there was talk of the passing of the central lighting fixture. . . .

Let's see what the facts are. In the first place when there's no ceiling fixture, people apparently still insist upon a wall switch so as to avoid groping about in the dark in order to light a floor or table lamp. Result: You use more, not less, cable. We quote a prominent Long Island electrical contractor whom we queried on this subject:

"By eliminating ceiling fixtures we estimate a saving of 12′ of cable. However, if a base receptacle is to operate on a switch, which is usual in the absence of a ceiling fixture, there is approximately 20′ of cable used in most cases. In other words, you use 8′ more cable when you eliminate the ceiling fixture." (See diagram.—ED.)

Furthermore, in order to lead the wire to a wall switch, you sometimes bypass the location where a ceiling fixture would go. . . .

Let us look at this so-called conservation from another point of view. In a minimum bedroom employing a central ceiling fixture, you have as a rule a table lamp on the night table, plus one or two so-called vanity lamps. If no ceiling fixture is used, you must usually introduce at least one floor lamp with a pretty large bulb in it. What is the relative use of critical metals in lighting fixtures as compared with lamps? We took two typical running numbers in our line and found the following facts to prevail on the basis of 1,000 units: The ceiling fixture requires



• Wiring diagram submitted by Reader Blitzer for a pair of bedrooms in a typical small on-slab house shows two alternate circuits: 1) Solid lines represent a circuit involving ceiling fixtures and requires 98′ of cable; 2) dotted lines represent a circuit with a switch-activated base receptacle in each room and requires and uses 107′ of cable. The latter figure would be reduced considerably if cables connecting base receptacles were run through studs, but drilling the studs is apparently more expensive than using the extra cable.—ED.

(Continued on page 79)

RESULTS GUARANTEED BY GOLD BOND!



E. T. Woolfolk
STATE OFFICE BUILDING
JACKSON, MISSISSIPPI

Architect . . . . . E. L. Malvaney
Jackson, Mississippi

General Contractor . J. A. Jones Construction Co.
Charlotte, North Carolina

Plaster Contractor . . . . . Harold Western
Jackson, Mississippi

ON ANY job it's a definite advantage to the architect, builder, and owner to keep the number of brands of building materials—the suppliers—to a minimum. This is particularly true in the case of a big job like you see here—the new Mississippi State Office Building in Jackson.

For example, take the walls and ceilings in this building. Gold Bond Base Plasters, Moulding, Keene's Cement, and Metal Lath were used exclusively...National Gypsum assumes the responsibility for the performance of all these products. There are over 150 Gold Bond Building Products, each one fully described in Sweet's and available at your local Gold Bond Lumber and Building Materials Dealer.

You'll build or remodel better with Gold Bond®

NATIONAL GYPSUM COMPANY • BUFFALO 2, NEW YORK

Lath, Plaster, Lime, Sheathing, Wall Paint, Rock Wool Insulation, Metal Lath, Sound Control Products, Fireproof Wallboards and Decorative Insulation Boards.



IN THIS desert home at Palm Springs, California, Kaiser Aluminum corrugated roofing is used in the living room ceiling to diffuse sound and carry the attractive exterior corrugation design inside the house. The corrugations deflect and hinder movement of sound waves.



KAISER ALUMINUM corrugated roofing is used on wing walls to reflect heat from patios and to provide wind shelter. Horizontal corrugations blend with the roof design to give a lower, wider effect.

KAISER ALUMINUM ROOFING helps keep interiors cooler during hot days by reflecting up to 60 per cent of the sun's rays. At night, when desert temperatures fall, the aluminum helps retain interior warmth to give this beautiful home a more uniform temperature over each 24-hour period.



ARCHITECTS: Clark and Frey, Palm Springs.

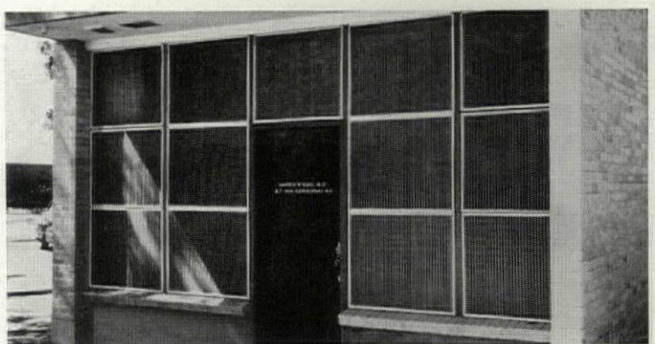
KEEP ALUMINUM IN YOUR PLANS



KAISER ALUMINUM SIDING is used for fire-resistant curtain walls in R. H. Macy's San Francisco store. In several instances siding was locked together but most often was set vertically at an angle several inches apart to permit circulation of air. The lightweight panels permit overnight remodeling. Architects: Gruen & Krummeck, San Francisco.



DUCTWORK MADE OF Kaiser Aluminum cut installation and fuel costs in this Richland, Washington, housing project. Architects and engineers J. Fletcher Lankton-John N. Ziegele, Peoria, Ill., decided on Kaiser Aluminum because, uninsulated, it delivers as much heat as insulated galvanized material. Aluminum's lightness enabled crews to install units faster, with less worker fatigue.



KAISER ALUMINUM SHADE SCREENING was installed in the doors and windows of this medical office to lower interior temperatures on hot days, and enhance the beauty of the exterior. Tiny louvers block sun's heat rays, but admit comfortable, glareless light. Additional benefits: Privacy, an effective insect barrier, protection from fading.

KAISER ALUMINUM is now helping to meet the critical demands of national security, but a limited amount of some aluminum building materials is still available.

We suggest you check with your sources of supply before deciding upon any substitute material.

When you are planning for defense purposes and have government approval, aluminum building materials will usually be available in the quantities required.

What about the future for aluminum building materials?

Kaiser Aluminum has started work on new facilities that will increase its production by 80 per cent. As soon as possible, this additional aluminum will be shared by the building industry for civilian uses.

This prospect for a plentiful supply helps spell a bright future for aluminum in the building industry. So, when you plan for the future, we urge you to *keep aluminum in your plans.*

Aluminum building materials offer exclusive advantages

They offer advantages in beauty, design and quality that are found in no other building material. We feel they deserve your consideration for the present and the future. Representative applications of Kaiser Aluminum building materials in use today are shown on these pages.

For full information about any of these Kaiser Aluminum building materials, including AIA files, write: Consumer Service Division, Kaiser Aluminum & Chemical Sales Inc., 555 Kaiser Building, Oakland 12, California.

Kaiser Aluminum

A MAJOR PRODUCER OF
BUILDING MATERIALS FOR FARM, HOME AND INDUSTRY

SOLD BY KAISER ALUMINUM & CHEMICAL SALES, INC., KAISER BUILDING, OAKLAND 12, CALIFORNIA . . . OFFICES IN:
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Milwaukee • Minneapolis • New York • Oakland • Philadelphia • Portland, Ore. • Rochester, N. Y. • Seattle • Spokane • St. Louis
Wichita • EXPORT OFFICE, OAKLAND, CALIFORNIA • WAREHOUSE DISTRIBUTORS IN PRINCIPAL CITIES



We doubt that you've worked on many clubhouses like *this* one lately.

We haven't helped heat any, either.

But we *can* help architects and their heating engineers provide the proper thermal environment for any client—anywhere—in any kind of structure.

We have a lot of literature on the automatic control of all phases of heating, ventilating and air conditioning. Information you should have in your files.

And we have a lot of very well-informed control engineers—in our 89 different offices—who have a lot *more* information right at their finger tips.

We sincerely believe we can help you on any project that poses problems of control of any kind—for *control* is Honeywell's business.

So, why not *talk to Honeywell?* Why not *write* to Honeywell for complete information on the equipment discussed in the column across the page? And why not do it *now?*

MINNEAPOLIS
Honeywell

First in Controls

600 lbs. of steel, 45 lbs. of aluminum, 385 lbs. of copper—a total of 1,030 lbs. of metal. The lamp requires 6,000 lbs. of steel and iron, 1,000 lbs. of zinc, 3,000 lbs. of brass (or a substitute), 242 lbs. of copper—a total of 10,242 lbs. of metal, 10 times as much as the ceiling fixture!

It is quite apparent that while some savings in critical material may ensue to the builder if he eliminates ceiling fixtures, there is no saving to the economy as a whole.

Common sense tells us, if we have only one important light, it is best located in the center of the ceiling. For similar diffusion of light in terms of floor lamps, for example, we would probably need two floor lamps. It is doubtful whether the illumination would be as good, even though more power would be consumed. (Incidentally, let's not forget we may have to conserve electric power, too!)

In the living room, the number of lamps has been multiplied since the ceiling fixture was eliminated some years ago. The tendency away from ceiling fixtures has been most pronounced in the living room, but even here a reversal has begun to make itself felt. Recessed lighting is one manifestation—and a sound one, too. Overhead lighting is a sturdy plant: it seems to be desicating, then suddenly it blooms again, perhaps in another form. . . .

We have no axe to grind in this matter. We are marketing with equal activity ceiling fixtures, wall fixtures, table and floor lamps. It makes no difference to us what the sales pattern is. We are, however, basically concerned with the truth itself, i.e., what kind of lighting is best?

EDWARD H. R. BLITZER
Lightolier
Jersey City, N. J.

Translation into action

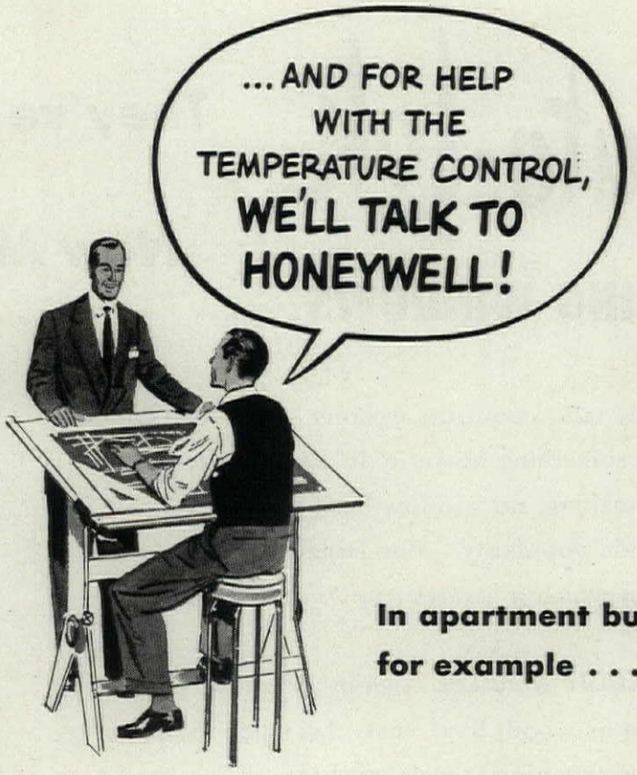
Sirs:

As president of the Oklahoma Chapter of the American Institute of Architects, I had arranged for a meeting of the architects of Tulsa to discuss this very matter. . . . I had prepared a memorandum for submission with the idea of using the present emergency as a lever to try to affect some changes in our local code. It has been the opinion of many of us that the code is entirely too rigid and particularly bad as regards plumbing and electric wiring.

The magazine came to my desk just the day before the meeting. After reading your article, I revised my memorandum. I also wrote a letter to the Mayor and City Commissioners on behalf of myself and those architects that attended the meeting and released this letter to the press. The effect was rather startling. The local papers played it up and, as a result of the publicity, the Mayor called a special meeting of the City Commissioners.

There were about 50 people present, including some 10 architects, engineers, builders, real estate men, plumbing and electrical contractors and a strong representation of the unions. The Mayor

(Continued on page 82)



In apartment buildings, for example . . .

Question: Is there any way to control the temperature in an apartment building so that all tenants will be satisfied at the same time?

Answer: There certainly is—by installing Honeywell Personalized Heating Control. With PHC, each apartment has its own individual thermostat—so each tenant can select the temperature most comfortable for him.

Question: But we've got to consider fuel bills. Won't they go up—with every tenant free to regulate his own heat?

Answer: On the contrary, they'll go down—as much as 20% annually! Surveys show owners often have to overheat a whole building to satisfy the 10% who like to live at 76°. Yet, most tenants want no more than 72°. Their PHC will regulate to that temperature—and save your client money.

Question: How about the added cost of PHC? Is individual control equipment more expensive to install than ordinary equipment?

Answer: Initially, Personalized Heating Control does cost more—although probably less than you think. But PHC is *not* just an added cost, it's an *investment* that pays definite, worth-while dividends. Experience has shown tenants will gladly pay a little extra for the greater comfort individual controls give. In just a few years this extra will pay for the thermostats and valves. And from then on, the added income will benefit your client.

Gentlemen: Send detailed information on Personalized Heating Control for apartment buildings.

Name_____ Firm Name_____

Address_____

Send this coupon today to: Dept. MB-5-82, Minneapolis 8, Minnesota

MINNEAPOLIS **Honeywell**

First in Controls

Auto-Lok AWNING WINDOWS

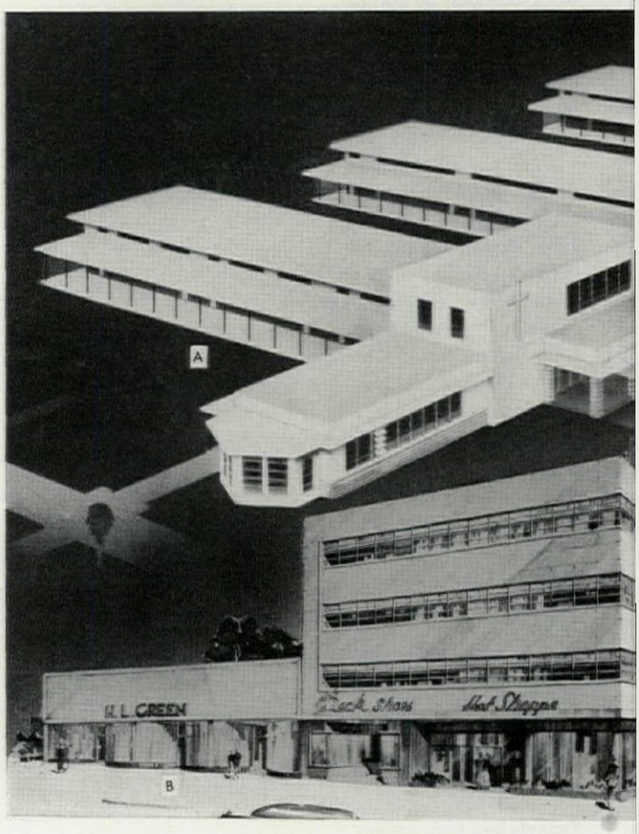
They've Brought New Meaning to the Phrase...

Everybody talks about the weather -- but AUTO-LOK has done something about it! In all the history of window making, no window has forged so quickly into nation-wide popularity -- due largely to the practical manner in which it assures true "weather control."

HOT OR COLD? Auto-Lok Awning Windows (in either aluminum or wood) have vents that open to almost 90 degrees, scooping in welcome breezes. Too, they can be closed up -- literally air-tight -- and consequently effect real fuel and air-conditioning economies.

RAINS OR SNOW? Easy to keep the driving downpours and snow flurries outside -- without sacrificing the ventilation that is so imperative. Auto-Lok's weather-stripping and the automatic locking action make it indeed the ***TIGHTEST CLOSING WINDOW EVER MADE!***

ALL CLIMATIC EXTREMES. Yes, Auto-Lok functions equally well in hurricanes or dust-storms, cold winds or on heat-filled, humid days. It affords protection against the elements, provides perfect visibility -- and fits readily into practically any architectural scheme.



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"The product that has made America awning window conscious."

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ALUMINUM OR WOOD

THE TIGHTEST CLOSING

"Weather Control"



The Window with the

"FLOATING SEAL"

Merely providing weatherstripping isn't the sole answer to elimination of air infiltration. Only with AUTO-LOK do you get the full protection potential of vinyl plastic weatherstripping! Patented AUTO-LOK hardware automatically pulls the vents in tight (locking them at all four corners of each vent) and compresses them against the vinyl plastic, to create a "floating seal."

This "floating seal" assures a degree of tight closure* heretofore believed impossible.

* *Air infiltration through AUTO-LOK is only 0.095 cfm per foot, by actual laboratory test.*

Pictured above:

(A) Saint Martha's Parochial School
Sarasota, Fla.
Arch. -- Kannenberg and Hanebuth

(B) Eig Building -- Silver Spring, Md.
Arch. -- Arthur L. Anderson

(C) De Paul Hospital School of Nursing
St. Louis, Mo.
Arch.-Engr. -- Maguolo and Quick

Consult your copy of SWEET'S, and write for name of nearby AUTO-LOK distributor and complimentary copy of

"WHAT IS IMPORTANT IN A WINDOW?"

Please address Dept. MB-5

LUDMAN
Corporation

WINDOWS EVER MADE!

P. O. BOX 4541 MIAMI, FLORIDA



This, of course, is somewhat exaggerated, but it's an absolute fact that it takes more than plumbing to make a good bathroom. Architects everywhere are specifying Blo-Fan for the bath, because it draws off excessive heat and humidity. It keeps walls from sweating and mirrors from fogging. It prevents embarrassing odors from spreading throughout the house.

Blo-Fan Model 206, designed especially for bathroom installation, is a low-cost, economical unit that pays for itself by keeping the bath looking like new for years and years . . . And, it pays off, too, in cleanliness, comfort and better living.

Two other Blo-Fan models, the No. 208 and No. 210, are also available for installation over the points of air pollution in the kitchen, game room and laundry. Model 210 is equipped with the NINE-SPEED switch, an exclusive Blo-Fan feature, which allows Mrs. Housewife to control the rate of ventilation as easily as she does the speed of her automobile.

Remember, if it hasn't got this blade it isn't a Blo-Fan!!!



This patented Blo-Fan blade combines both fan and blower principles to move more air—quickly, quietly and efficiently!!!

Blo-Fan*

*TRADE MARK REG.

THE MOST IMITATED HOME VENTILATOR IN AMERICA

25th Anniversary Year

Stocked by more than 600 wholesalers in 350 cities.

PRYNE AND CO., INC. BOX A-551, POMONA, CALIFORNIA

Factories: Pomona, California; Newark, New Jersey **Warehouses:** Los Angeles, San Francisco, Chicago, Atlanta

LETTERS—WASTE IN BUILDING

opened the meeting by reading my letter.

The unions promptly offered violent opposition to any changes in the present code. They referred to any such changes as "breaking down the code." Some of the architects spoke out quite strongly about the advisability of making certain changes and we got considerable support from some of the contractors. . . .

After about an hour's argument, the Mayor agreed to appoint a committee for each interested organization. The unions even opposed this, but we got good support from the Mayor and the Commissioners. . . .

How much permanent good will come of this still remains to be seen, but at least we have gotten action. . . .

DONALD MCCORMICK, *Architect*
Tulsa, Okla.

Sirs:

You have performed a genuine service to the economy of our country. . . . I know that 20% or more in materials and labor can be saved in home building if the panel's proposals are utilized.

My personal copy of THE MAGAZINE OF BUILDING is in the hands of members of our local city council. I hope that many of your readers are taking time and giving effort to help sell this idea. If they will, the building industry need not wither during the current period of rearming.

EUGENE T. LAREW, *Engineer*
Iowa City, Iowa

A look at the hole card

Sirs:

The city planners will soon be looking at their hole cards for they are forcing the man who pays the bills (the buyer) out of the city and away from the restricting influences which cut so deeply into his building dollar.

Congratulations for a job well done.

DAVID B. BLUE
Tulsa, Okla.

Where is prefabrication?

Sirs:

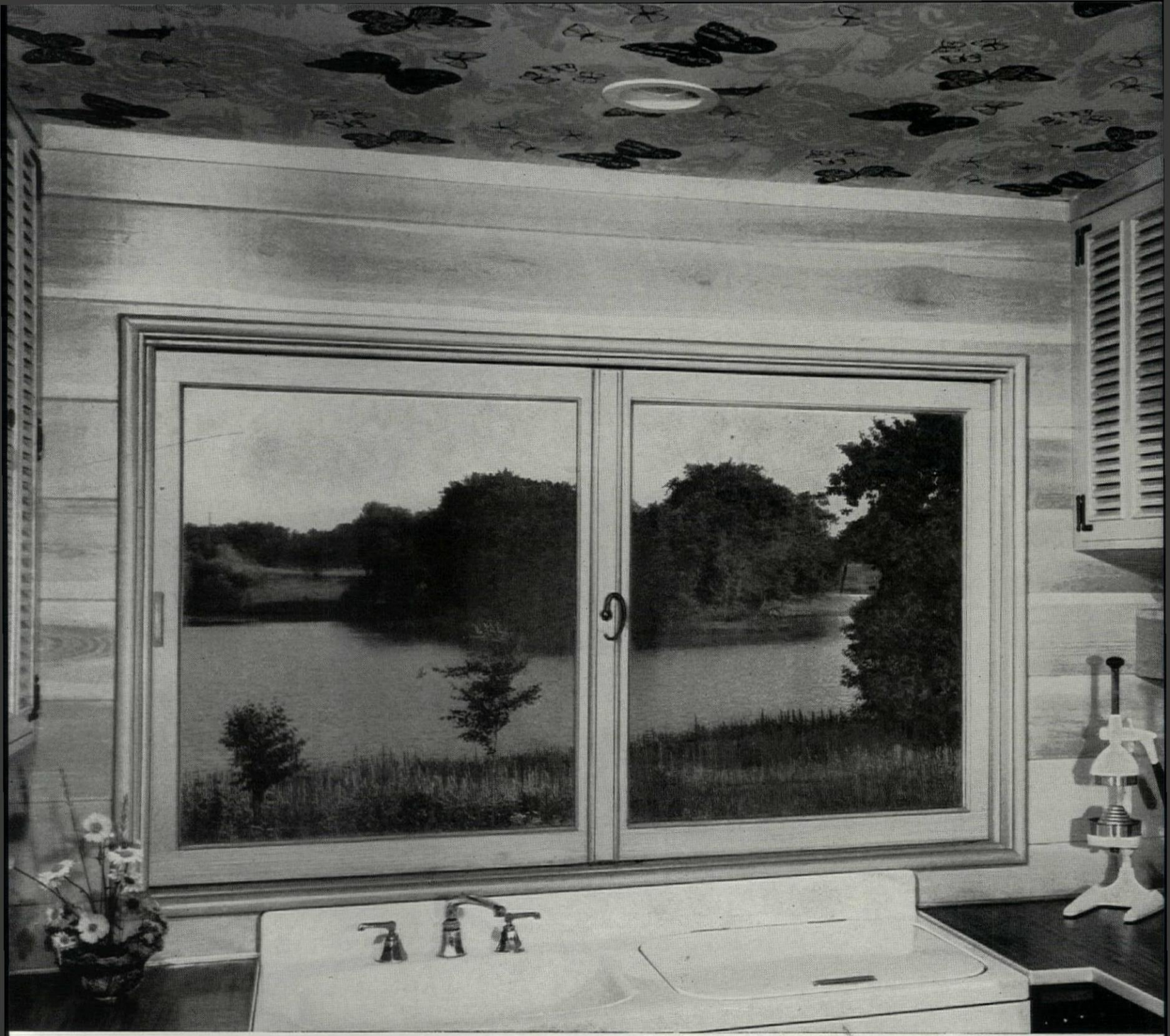
I have a couple of questions to ask. Does prefabrication no longer enter into the thinking of the leaders in our industry as a means of reducing building costs? I am referring, of course, to complete prefabrication rather than partial prefabrication. The other question is will the leaders of the building industry consider the possibility of cutting building costs by reducing the number of profits which are now taken on building materials between the source and the consumer?

Congratulations on a big job squarely tackled.

ALLEN J. STRANG, *Architect*
Madison, Wis.

• 1) The status of prefabrication is presented elsewhere in this issue; 2) An increasing number are cutting out the middlemen and their profits.—ED.

(Continued on page 88)



WINDOWALL *specified by Humphrey & Hardenbergh, Inc., Architects*

ANDERSEN *Windowalls*®

COMPLETE **WOOD** WINDOW UNITS

PICTURE WALL captures a beautiful view with a single wide Andersen Gliding Window Unit. It's a WINDOWALL. It provides the crowning touch to a kitchen which shows interesting use of materials throughout.

This WINDOWALL floods light and air into the room that needs lots of both. It adds comfort and beauty to a kitchen work area which too often is needlessly drab. And because it is a WINDOWALL, it is efficient both as window and as wall.

See Detail Catalog in Sweet's Architectural and Builders' Files, or write us for further information. The complete WINDOWALLS Tracing Detail File will be sent on request to architects and designers at no charge. Andersen WINDOWALLS are sold by lumber and millwork dealers. *TRADEMARK OF ANDERSEN CORPORATION

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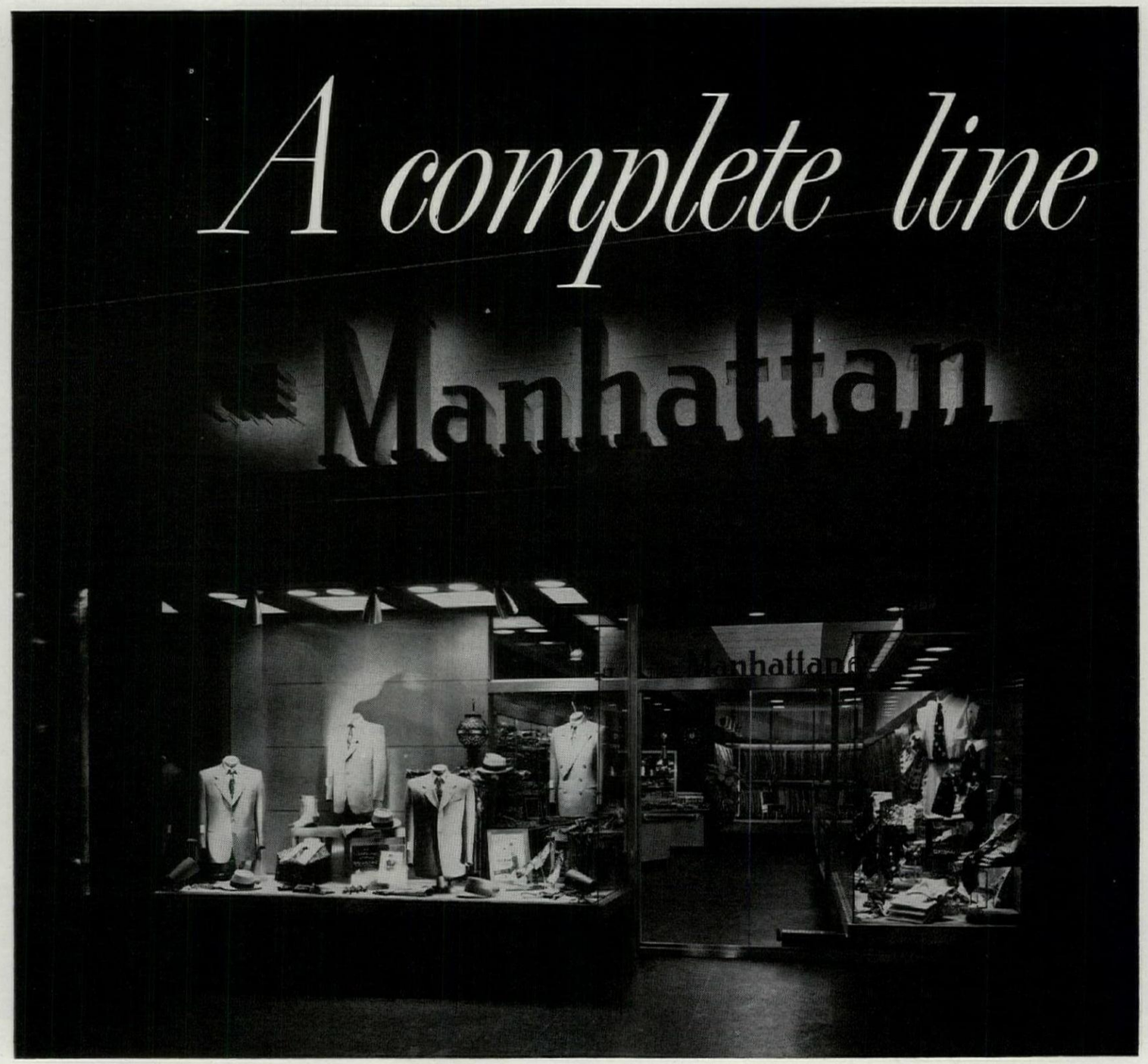
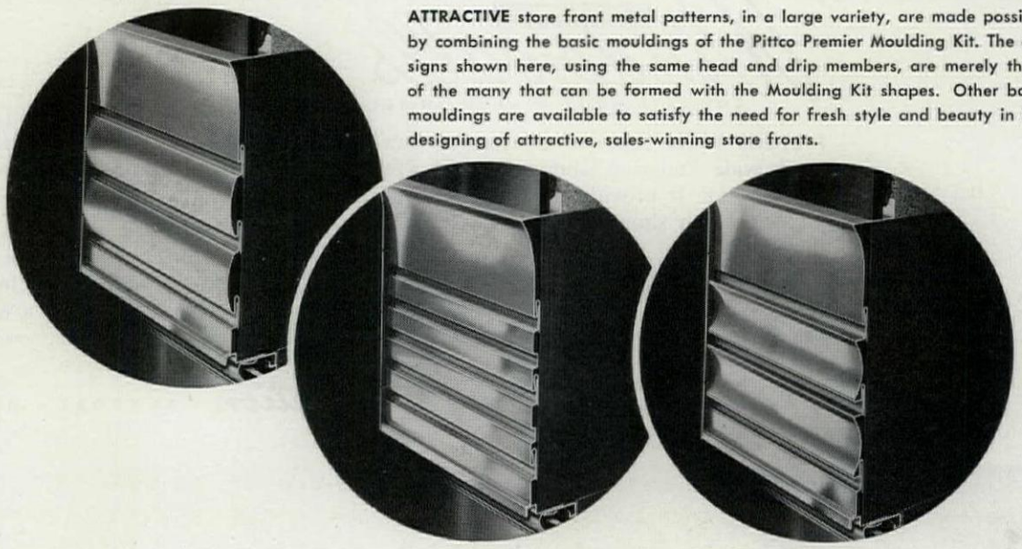
A complete line



IN THIS men's wear store at Cumberland, Maryland, Pittsburgh Products, including Pittco De Luxe Store Front Metal, Gray Suede-Finish Carrara facia, Polished Plate Glass display windows, and Herculite Doors, were combined to create a sales-inviting open-vision structure. In the modernization, as well as new building, of a wide variety of business establishments all over the country, Pittsburgh Products have achieved the enviable reputation of being the leaders in their field. Architect: Morris Lapidus, New York City.

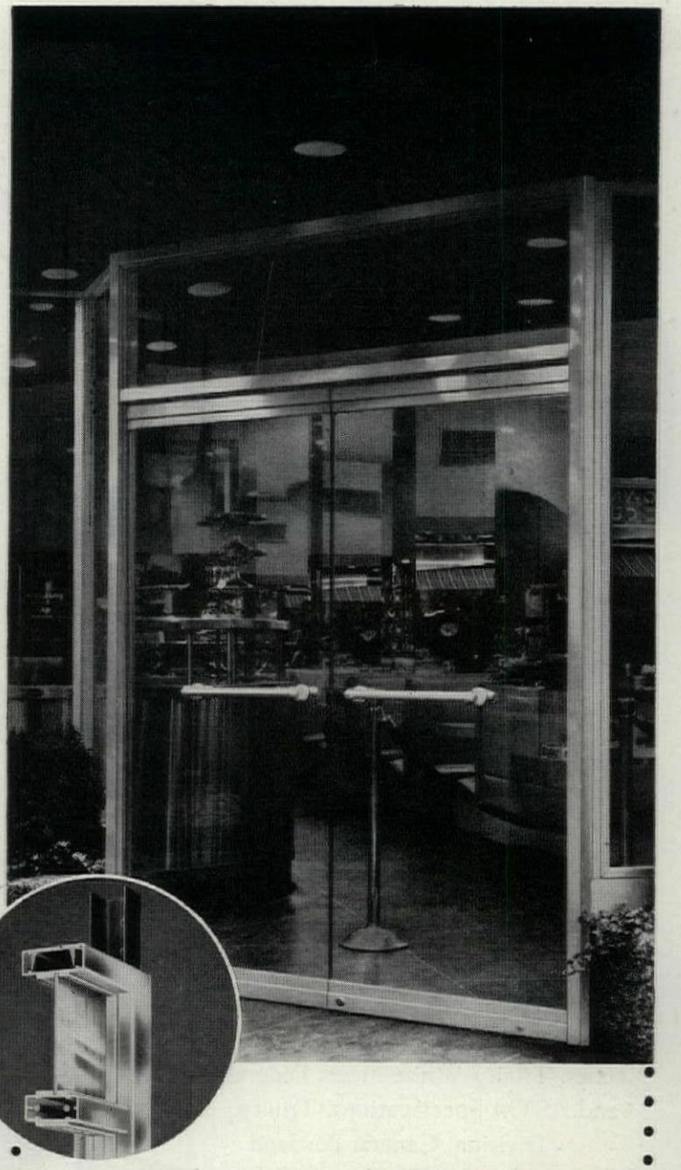


ATTRACTIVE store front metal patterns, in a large variety, are made possible by combining the basic mouldings of the Pittco Premier Moulding Kit. The designs shown here, using the same head and drip members, are merely three of the many that can be formed with the Moulding Kit shapes. Other basic mouldings are available to satisfy the need for fresh style and beauty in the designing of attractive, sales-winning store fronts.

# of quality products for store fronts and interiors



THIS FASHIONABLE jewelry shop in Miami Beach, Florida, utilizes a large mirrored wall of Pittsburgh Structural Mirrors, together with niches and ingenious display cases of Pittsburgh Polished Plate Glass to effect a smart, spacious-looking store interior of immediate appeal. In interiors as well as exteriors, Pittsburgh Products are the choice of leading architects and merchants from coast to coast. Architect: Victor H. Nellenbogen, Miami, Fla.



INSTALLATIONS are faster, easier and less costly with Pittsburgh Doorways. That is because they are precision-built and reach the site as a completely "packaged" unit. All you do is unpack the frame, bolt it into the building opening and hang the sturdy Herculite Doors for whose strength the Pittsburgh Doorway has been especially engineered. Gone are those problems of setting and fitting, details of clearances and many other time and labor-consuming matters that usually increase costs on the job so substantially. Pittsburgh Doorways are available in twelve standard sizes and four free-standing models to fill almost any need. Inset shows a section of the rugged, precision-fabricated frame. It is made of extra-heavy extruded aluminum, highly polished and anodized. And it is heavily reinforced with steel channel and tie rods. Architects: Fuller & Beckett, Atlanta, Ga.

Design it better with **Pittsburgh Glass**

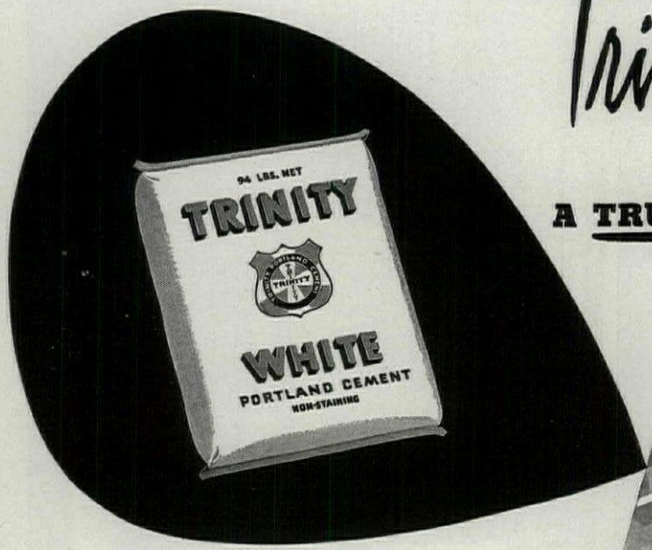
Your Sweet's Catalog File contains a complete listing and descriptions of Pittsburgh Plate Glass Company products.

PAINTS · GLASS · CHEMICALS · BRUSHES · PLASTICS

PITTSBURGH PLATE GLASS COMPANY

Trinity White

A TRUE PORTLAND CEMENT

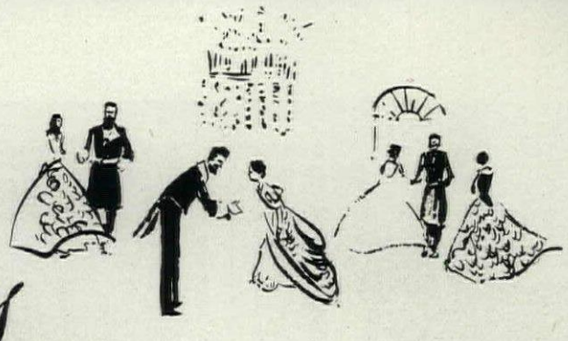


Wherever the need for white is indicated, use Trinity—the *whitest* white cement. Its whiteness has a penetrating quality for mass or for contrast. You'll get fine results with Trinity White in architectural concrete units, terrazzo, stucco, or cement paint. Where pigment is added, the extra whiteness gives clearer color tones. Trinity White meets Federal and ASTM Specifications. Trinity Division, General Portland Cement Co., 111 W. Monroe St., Chicago; Republic Bank Bldg., Dallas; 816 W. 5th St., Los Angeles; 305 Morgan St., Tampa; Volunteer Building, Chattanooga.

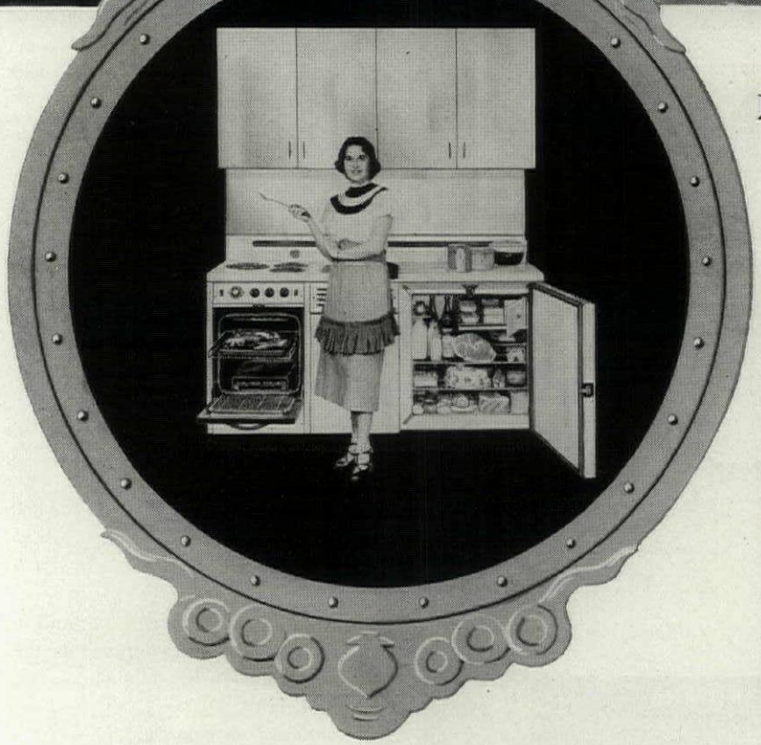
as white as snow

the whitest white cement... PLAIN OR WATERPROOFED

THE LUXURY OF *Crinoline days...*







MODERNIZED FOR 1951 LIVING

with

DWYER KITCHENS

Formerly called Murphy-Cabranette Kitchens. Same product. Same manufacturer. Same distribution. Merely a name change for simplicity.

Baker Apartments, Gainesville, Florida
Architect: Sanford Goin
Contractor: Fred H. Winston

City growth changed living needs in Gainesville . . . menaced this fine old home. But the venerable mansion met the change . . . profitably.

Interior remodeling, involving Dwyer Kitchens, resulted in 12 smart apartments . . . promptly rented and now yielding welcome revenue from what might have deteriorated into a tax-eating eyesore.

To you who plan remodeling or new construction for efficient, livable apartments, Dwyer Kitchens are proven assets.

In minimum space, Dwyer Kitchens provide full kitchen convenience attractive to tenants. Full vitreous porcelain fronts and rugged construction fit Dwyer Kitchens for the grueling service of rental properties.

Write for illustrated literature.

DWYER PRODUCTS CORPORATION—Dept. MB 551—**MICHIGAN CITY, INDIANA**



WHEN YOU ARE READY TO SELECT SPACE-SAVING DOORS...
Check these important features



THAT "FINISHED LOOK" — FOLDOOR comes in a wide choice of beautiful, colored, highly durable plastic-coated fabrics to harmonize with any color scheme. Topped with an attractive cornice. FOLDOOR installations have *that finished look.*



"EASY GLIDE" OPERATION — Built with a sturdy frame of rust-resistant steel, FOLDOOR travels on a rugged, single piece, two-rail steel track. The double-truck trolley, with large-diameter wheels, insures smooth, *easy-glide* operation.



"DOOR-KNOB HEIGHT" HARDWARE — Handles at normal, *door-knob height* is a FOLDOOR feature especially desirable in homes with small children. FOLDOOR'S simple yet positive latching mechanism is easily operated with one hand. No fussing, no fumbling with FOLDOOR.



"WALL-FIT" WIDTH — FOLDOOR occupies the least amount of "stack" space of any extensible door. When pushed back onto itself, FOLDOOR'S maximum width is only 5½ inches. This means FOLDOOR fits inside the measurements of most walls—does not stick out into the room.

You get them all with new, improved

HOLCOMB & HOKE

FOLDOOR

HOLCOMB & HOKE MFG. CO., INC. • INDIANAPOLIS, INDIANA

Profitable Installing Distributorships Still Open

LETTERS

HOUSE DESIGN COMPETITION

Sirs:

The House Design competition, as superbly presented in THE MAGAZINE OF BUILDING (Mar. '50), is a stimulant to better standards. . . .

FRANCIS C. WILSON, *President*
Wilson Housing Co.
Milwaukee, Wis.

Sirs:

Timid, anonymous little faces, those small house prize winners, yet somehow so familiar. The prizes might better have gone to Breuer and Stubbins, or to the earlier and bolder generation that produced the originals.

New architecture? Anyway, new playrooms.

ELIZABETH B. MOCK
Norman, Okla.

Sirs:

. . . I commend you for the part you played in the House Design Competition.

My husband and I spent some time last year inspecting housing developments in the northeast and north central part of the U. S. We were looking for new ideas to bring back to the Olson Brothers Construction Co. here in Houston. We were amazed and disappointed. . . .

I hope housing developers over the country will take note of the designs submitted by the contest winners. Younger home buyers in particular would be happy to find replicas of these houses.

More builders must be willing to break from the idea that they have been building so long that *they know* what the public wants! . . .

MRS. JOHN OLSON
Houston, Texas.

Sirs:

I was completely disappointed. . . . The houses all looked alike, although they came from all over and from different people. They looked like what has become, to me, the Competition Style. . . .

ALFREDO LARIN
Racine, Wis.

Sirs:

Not a single one of the shed roof prize winning designs could be built in the Township of Teaneck, N. J., a large residence suburb of New York City. Its building code requires a minimum distance of 22′ from the under side of the first floor construction to the roof ridge. . . .

HARRY ALLAN LUCHT
Architects League of Northern N. J.
West Englewood, N. J.

• Is Teaneck's building code as up-to-date as the low pitched roof?—ED.

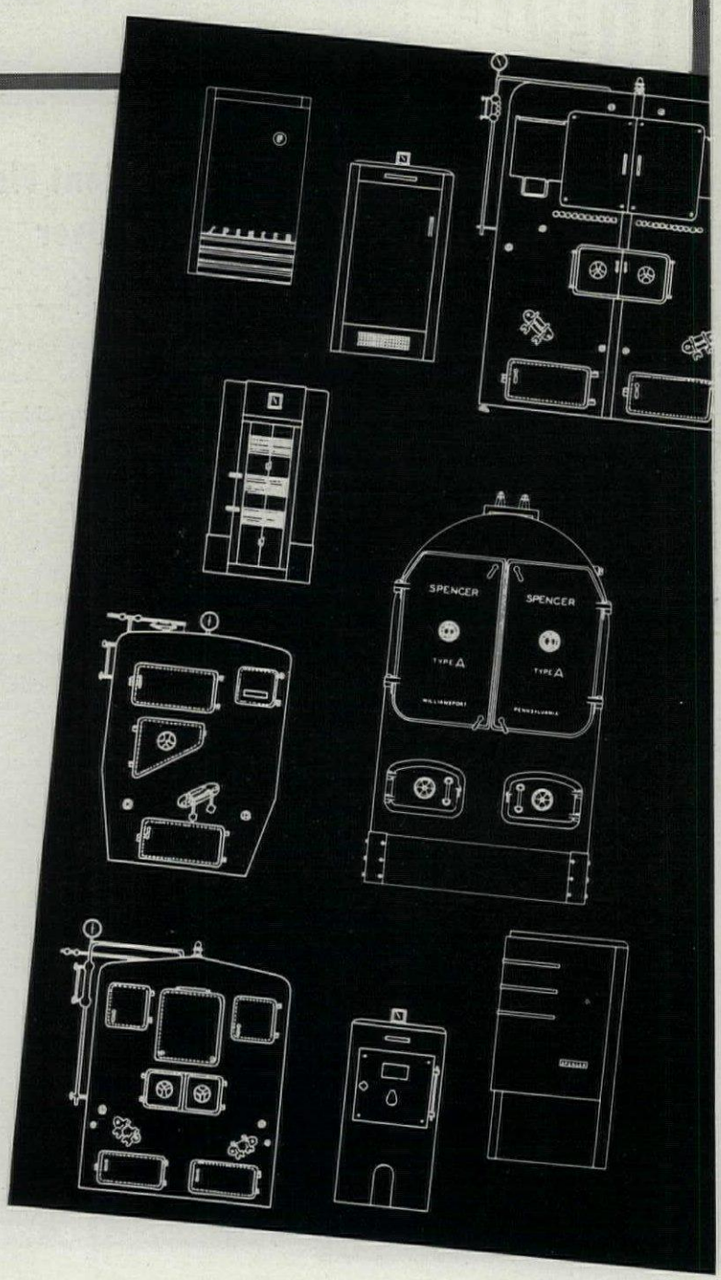
Sirs:

My sympathies go out to the jurors . . . and to the contestants who must be discouraged at the prospect of encasing human life in such shacks, when it isn't their fault.

(Continued on page 90)

SPENCER

The Quality Line of HEATING BOILERS



VERSATILE

DEPENDABLE...

Backed by more than 60 years' leadership

There is a SPENCER for *every* building... for *every* fuel, with capacities from 290 to 45,000 square feet, steam. Precision engineered and manufactured to give superior, *guaranteed* service.

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HEATER
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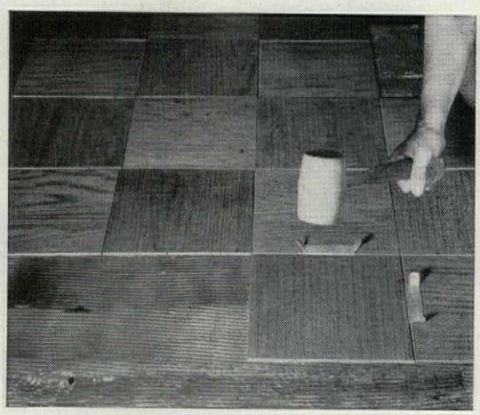
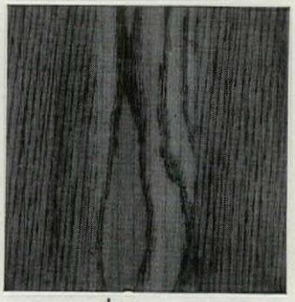
Constructed in accordance with ASME requirements. Fully approved by Steel Boiler Institute or Institute of Boiler and Radiator Manufacturers.

MODERNIZE WITH HARDWOOD FLOORS!

Economize WITH PARKAY



Ready-Finished; In Resilient Floor Thickness; Laid Quickly Over Concrete, Wood or Terrazzo



New floors for old offer no problem with the use of Parkay. Only 3/16" thick. All the wearing surface of standard flooring without useless bulk or weight. Permits use with other resilient materials without changing floor levels. Factory finishing by craftsmen insures a lasting lustre and beauty not obtainable by on-the-job methods.

Parkay floors are applied with special adhesive to any smooth, sound subsurface. Simple and clean to install for new construction as well as for remodeling. Time and money saved on every job.

Parkay flooring, made of choice American Oak, is available in two styles—9" x 9" Tiles and 9" wide Broadboard in random lengths. Both styles can also be used for impressive, low-cost wall paneling. For complete details, see Sweet's Architectural File or write direct for free samples and complete information. Parkay, Inc., Louisville 9, Ky.

WM PARKAY READY-FINISHED HARDWOOD FOR FLOORS AND WALLS

LETTERS

Have we come to such an end of our architectural rope that $3,500 dwellings must look like these for $10,000? . . . I shudder to think of posterity having to live anywhere near or look at a subdivision of these booby-traps.

Let's face it. There is an irreducible minimum on every creative production. This display has exceeded it—trying to beat inflation on the rocks of bankruptcy instead of the brink of its spillway.

It is a prostitution of creative ability to try to produce design and comfort in thousands of such grouped houses. . . .

As Dagwood says to Blondie, "It's revoltin'—that's what it is!"

FREDERICK S. CATES, *Architect*
Baltimore, Md.

Sirs:

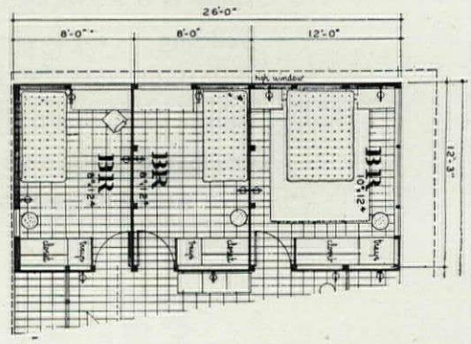
. . . Delighted with the Home Design Competition.

However, I call your attention to the ineligibility of the Second National Prize winner. I move that he be marked *hors de concours* because his area exceeds the competition area by 91.44 sq. ft., which is enough for another sizable room. . . . You will note on his plan (see cut) the summation of bedroom widths is shown as 26′. But 8′ + 8′ + 12′ = 28′ and not 26′. . . .

Sorry for the contestant.

JOHN H. PHILLIPS, JR.
Architectural Analyst
New Orleans, La.

• Sorry for Reader Phillips. He failed to carry his analysis far enough to find that the contestant made another and compensating error. The width of the



largest bedroom is actually 10′, not 12′ as shown in the outside dimensions of the house, and the total width is therefore Second Prize winner Rapson's 26′, not Reader Phillips' 28′.—ED.

J.LL.W. OR F.LL.W.

Sirs:

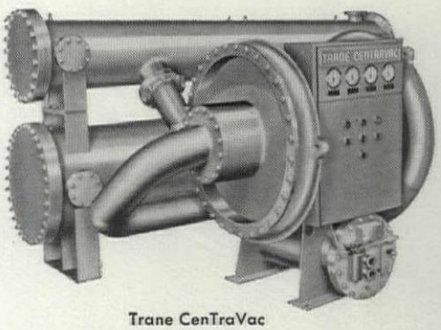
Concerning architecture: Wouldn't F.LL.W. be just a little panicky if, all of a sudden, organic forms entirely different from his would spring up all around him? Or can the working of principles behind effects, within the same spacial and temporal environment, produce entirely different effects?

In the cause of architecture,

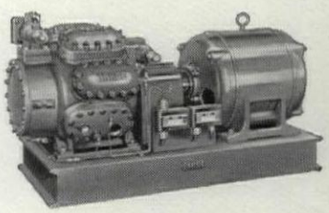
JOHN LLOYD WRIGHT
Del Mar, Calif.

• We don't know.—ED.

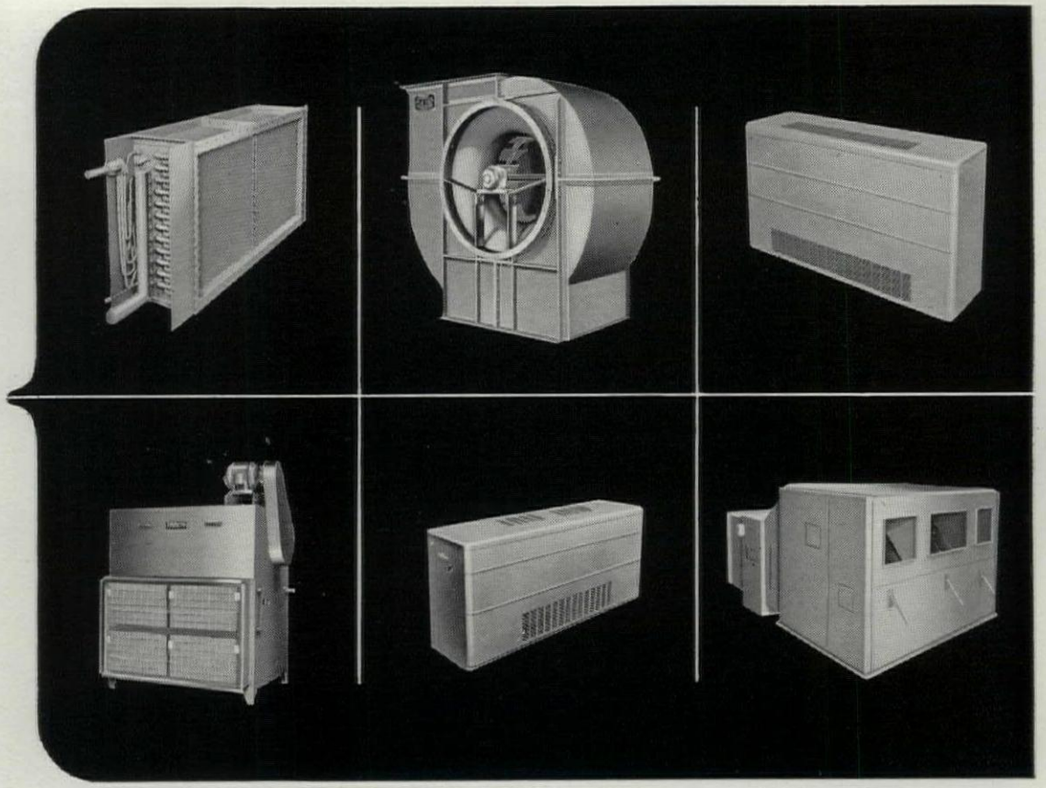
(Continued on page 96)



Trane CenTraVac



Trane Reciprocating Compressor



Trane Cooling Coil (above)
Trane Climate Changer

Trane Centrifugal Fan (above)
Trane Custom Air Unit

UniTrane Air Conditioner (above)
Trane Multi-Zone Climate Changer

How matched Trane Products make better systems

Here's why more and more people are specifying, installing and using more and more Trane matched products each year.

Specifiers know that Trane manufactures everything from hot water valves to refrigeration units. Using Trane equipment, they can create a wide variety of complete systems for every type of building. They combine Trane Evaporative Condensers with Trane Reciprocating Compressors, Trane Fans with Trane Cooling or Heating Coils, Trane Unit Ventilators with Trane Steam Specialties.

And when they use Trane equipment together, they are not only getting the fine features that have established individual Trane products as leaders in their respective fields but a lot more as well.

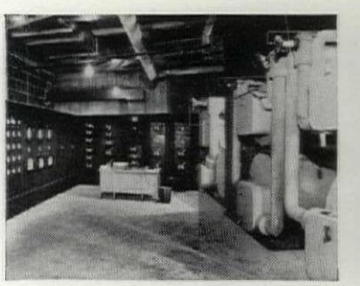
Save Time—If they need equipment counsel they see one salesman-engineer instead of several. They use one set of completely integrated catalogs conveniently bound into one handy binder.

Save Trouble—When they use Trane equipment to create a system, Trane assumes the responsibility for the correct performance of all its equipment when properly installed and controlled. There is no blaming the product of one manufacturer because the product of another doesn't operate satisfactorily.

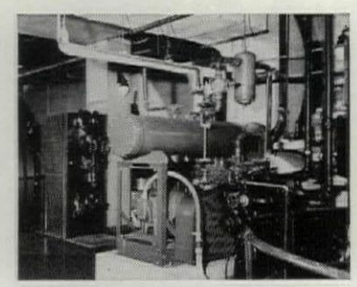
Better Performance, Too—Trane products are designed together, made together, tested together for service together. Each product is built to the same high level of quality. Into each product, Trane has incorporated important construction features that make that product a leader in its field. When these leading products are used together in a system, better performance is inevitable.

Add to all these specific advantages those that the installer enjoys. He orders equipment directly from one supplier. He can plan shipment of equipment more easily. He writes one check for the whole system. Bookkeeping is cut to the bone. So is installation because Trane products fit better together.

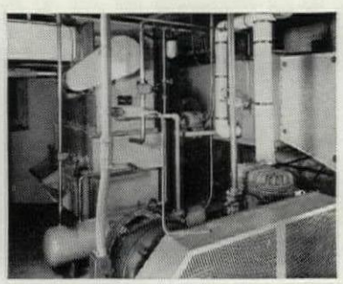
When Trane products are used together in complete systems, the user gets a better installation. Join those who have already found the advantages of complete Trane systems—specify and install Trane products.



Equipment room of a large office building where Trane centrifugal refrigerating units supply chilled water in an extensive Trane "undivided responsibility" air conditioning system.



This Trane Condensing Unit is perfectly matched with Trane Direct Expansion Coils to form the heart of a Trane system for the coffee shop of a large hotel.

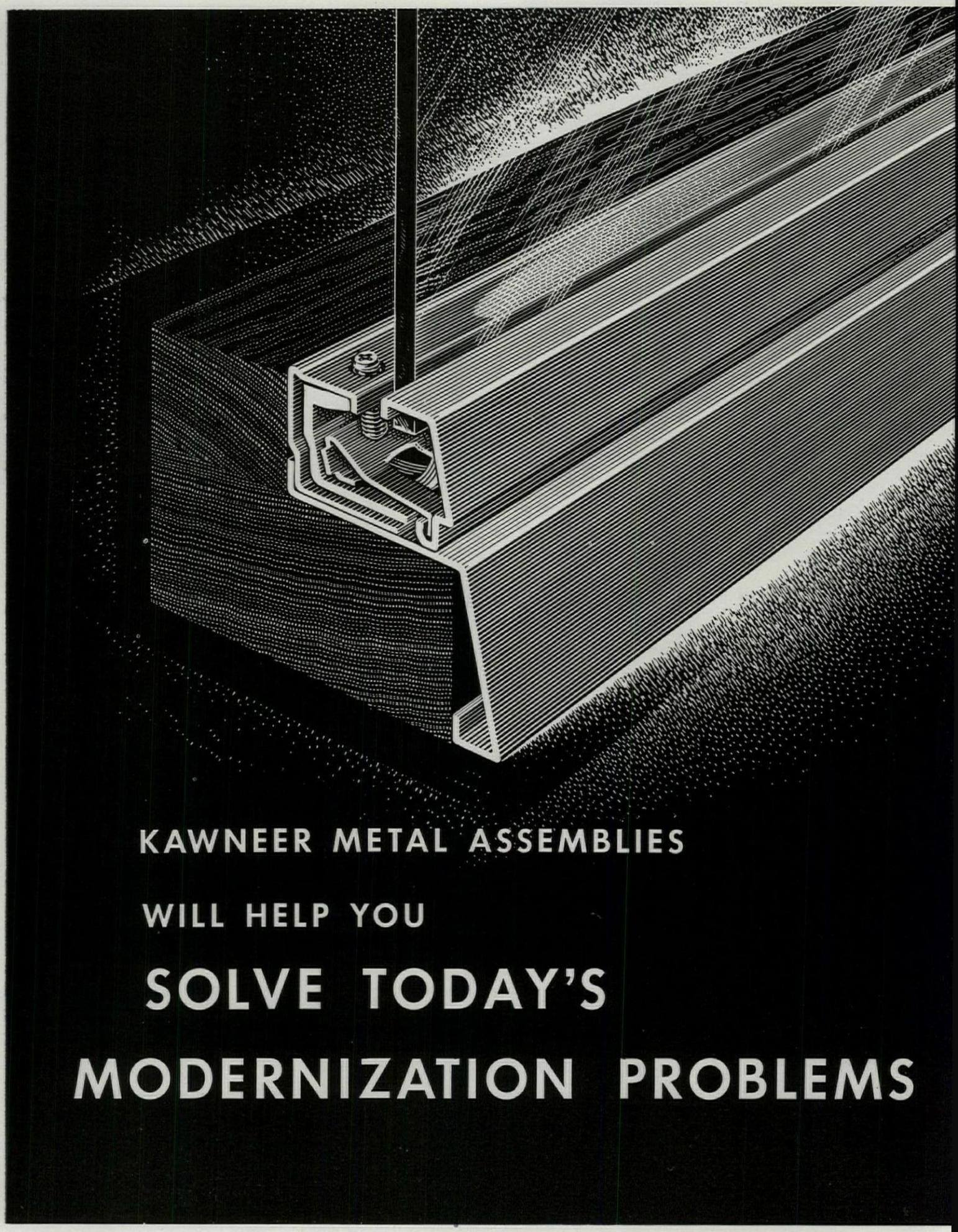


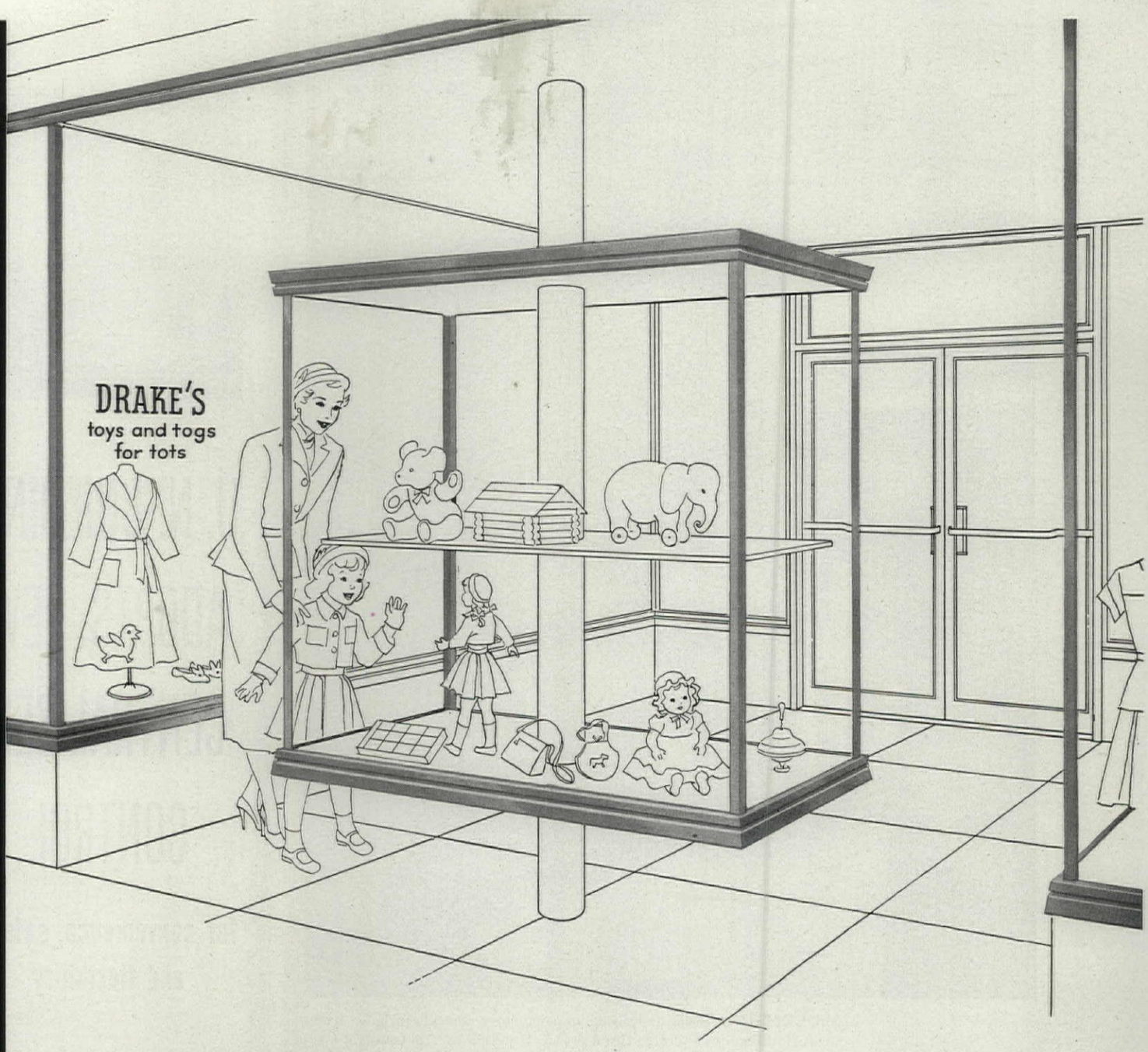
Real Trane product teamwork is illustrated by this complete Trane Compressor, Trane Evaporative Condenser and Trane Climate Changer installation.

TRANE

MANUFACTURING ENGINEERS
OF HEATING, VENTILATING AND
AIR CONDITIONING EQUIPMENT

THE TRANE COMPANY, LA CROSSE, WIS.
Eastern Mfg. Division, Scranton, Pennsylvania
Trane Company of Canada, Ltd. . . . Toronto
OFFICES IN 80 U.S. and 10 CANADIAN CITIES


KAWNEER METAL ASSEMBLIES
WILL HELP YOU
SOLVE TODAY'S
MODERNIZATION PROBLEMS



KAWNEER ARCHITECTURAL METAL PRODUCTS OFFER SOLUTIONS FOR THE LARGEST OR SMALLEST REMODELING JOBS

Architects and designers can achieve almost any desired store front effect by the creative selection and adaptation of Kawneer assemblies.

The Kawneer Line offers a wide variety of assemblies which have been successfully styled to complement contemporary architectural design. They have been engineered to meet modern structural requirements, and they're precision-made throughout.

To insure installations which will render long term satisfaction, Kawneer maintains factory-training schools for its installing mechanics.

The handsome, clean-lined sash pictured here is typical of the Kawneer Line. Like all other Kawneer glazing assemblies, it embodies the famous resilient-grip glass-holding principle.

For further details, consult your Kawneer Portfolio, Sweet's Catalog, or write Department MB-66, 1105 North Front Street, Niles, Michigan, or Department MB-66, 930 Dwight Way, Berkeley, California.

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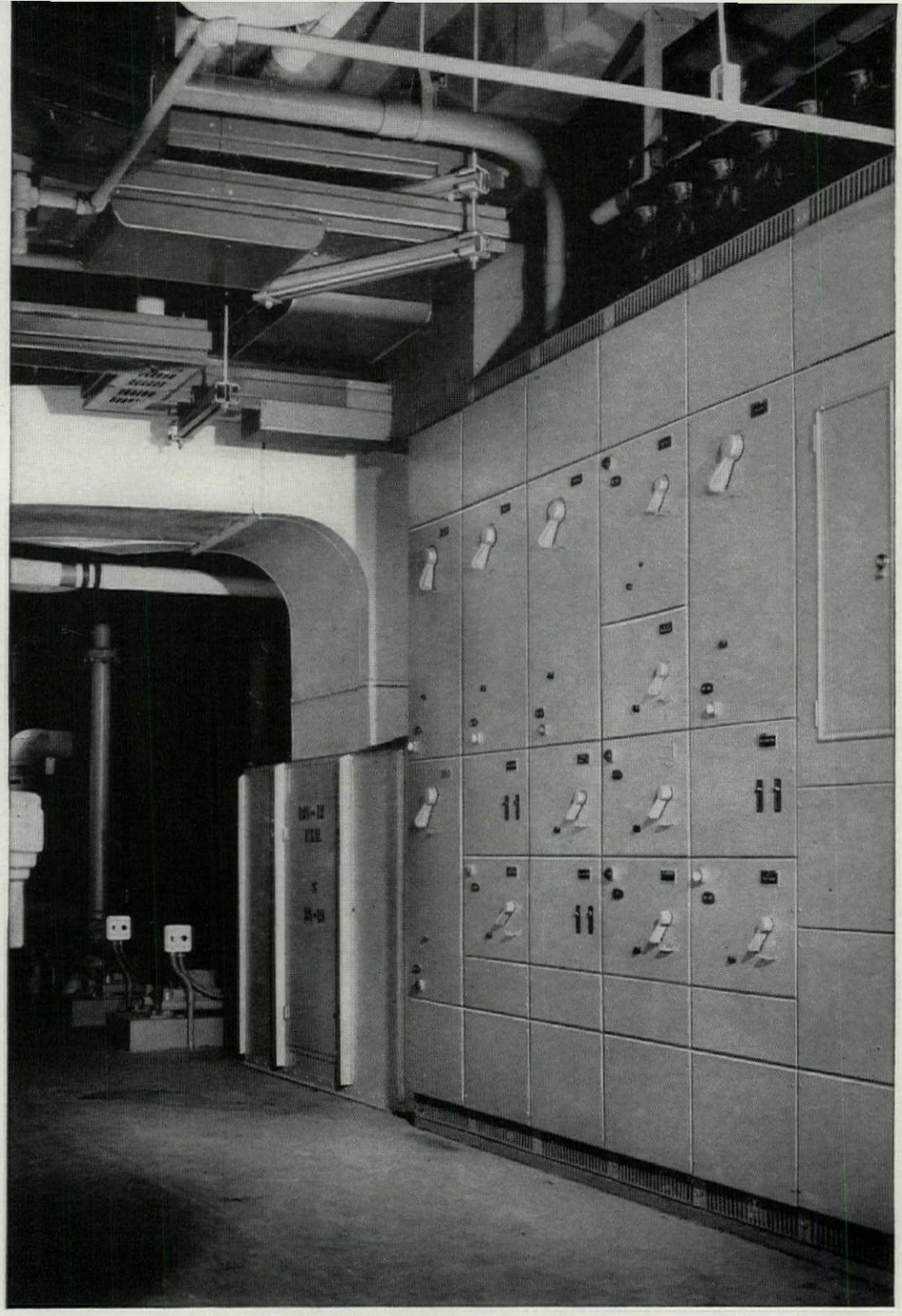
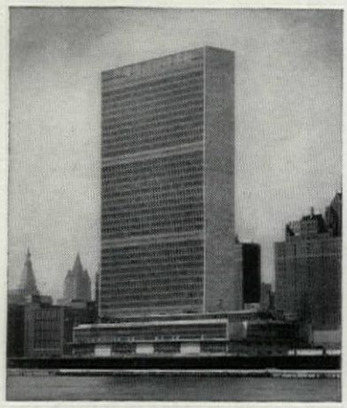
Store Front Materials
Aluminum Roll-Type Awnings · Modern Entrances
Aluminum Facing Materials · Flush Doors





U. N. BUILDING ADOPTS NEW CENTRALIZED CONTROL

for convenience, safety and flexibility

AIR CONDITIONING and miscellaneous motor controls in U.N. Secretariat Building are operated through this Trumbull CENTR-A-POWER Control Center. The control center is fed from the Trumbull FLEX-A-POWER LVD busway distribution system running throughout the building.

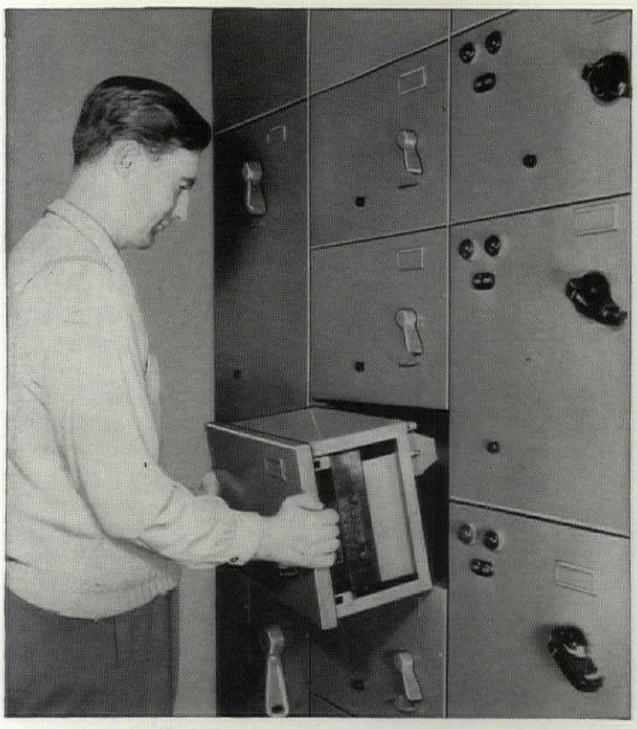
Centralizing all motor controls in one compact, flexible arrangement of front-connected troughs is an idea that appealed to the designers of the United Nations' new permanent headquarters.

Today, operators of the building's equipment enjoy the convenience, convertibility, safety and attractive appearance of Trumbull's new CENTR-A-POWER Control Centers.

Standardized starter-and-disconnect units are grouped in pre-fabricated, rigid steel troughs, in any arrangement. Any number of troughs can be set up in a variety of formations: back-to-back, "U," "L," etc. The control units, called CENTR-A-PLUGS, which are plugged into silver-plated vertical bus bars, are interchangeable from one trough to another.

Trumbull's CENTR-A-POWER control center is a companion to the recently-announced CENTR-A-POWER switchboard, and is another in the series of new Trumbull developments for greater economy, safety and efficiency in electrical control and distribution.

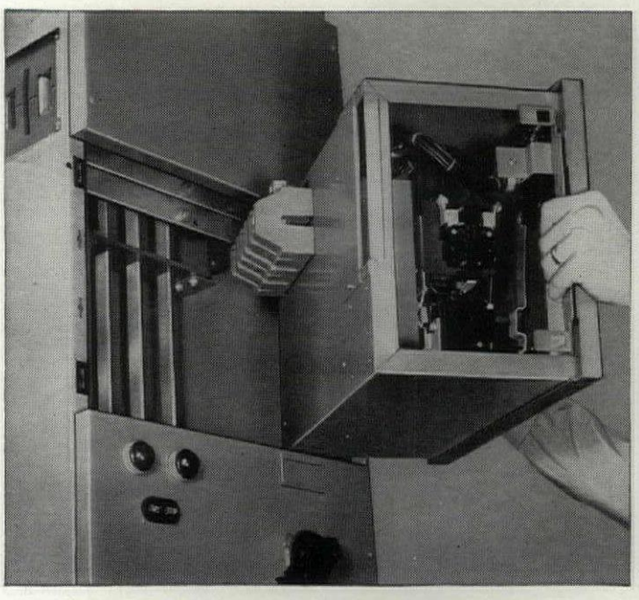
Write for CENTR-A-POWER Bulletins to THE TRUMBULL ELECTRIC MANUFACTURING COMPANY, Plainville, Conn.



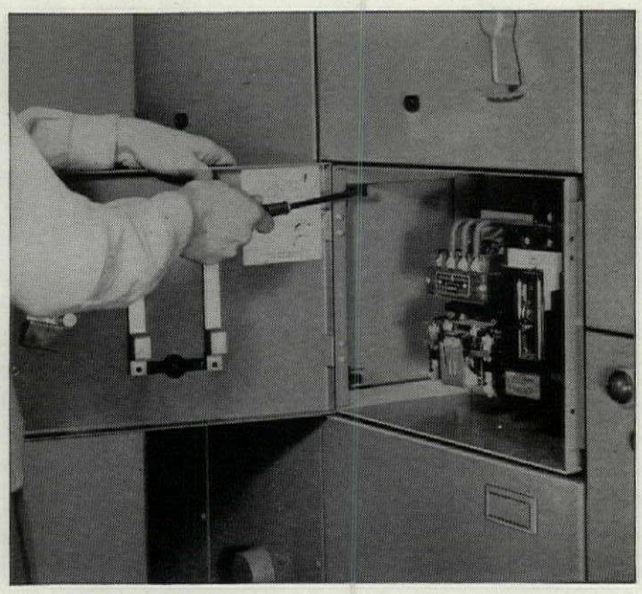
LOW-COST INSTALLATION results from standardization of components. From the complete selection of troughs and control units, the exact combination can be made up to meet any requirements. Floor space is saved by the compact all-front-wired trough design. Yet the ample gutter saves time by giving easy access to wiring.



EASY TROUGH ADDITION recommends CENTR-A-POWER Control Centers for applications where needs may change from time to time. Arrangements of both troughs and controls can be easily altered or added to, and even bus capacity can be increased as conditions require without change in insulators or steelwork.



SIDE-VENTILATED CENTR-A-PLUG is stabbed in from front. Each unit contains a starter-and-disconnect unit, which may be either Trumbull's new HCI high-capacity interrupter safety switch or a Trumbull AT circuit breaker. Ventilated side construction, together with trough vents top and bottom, keep controls uniformly cool.

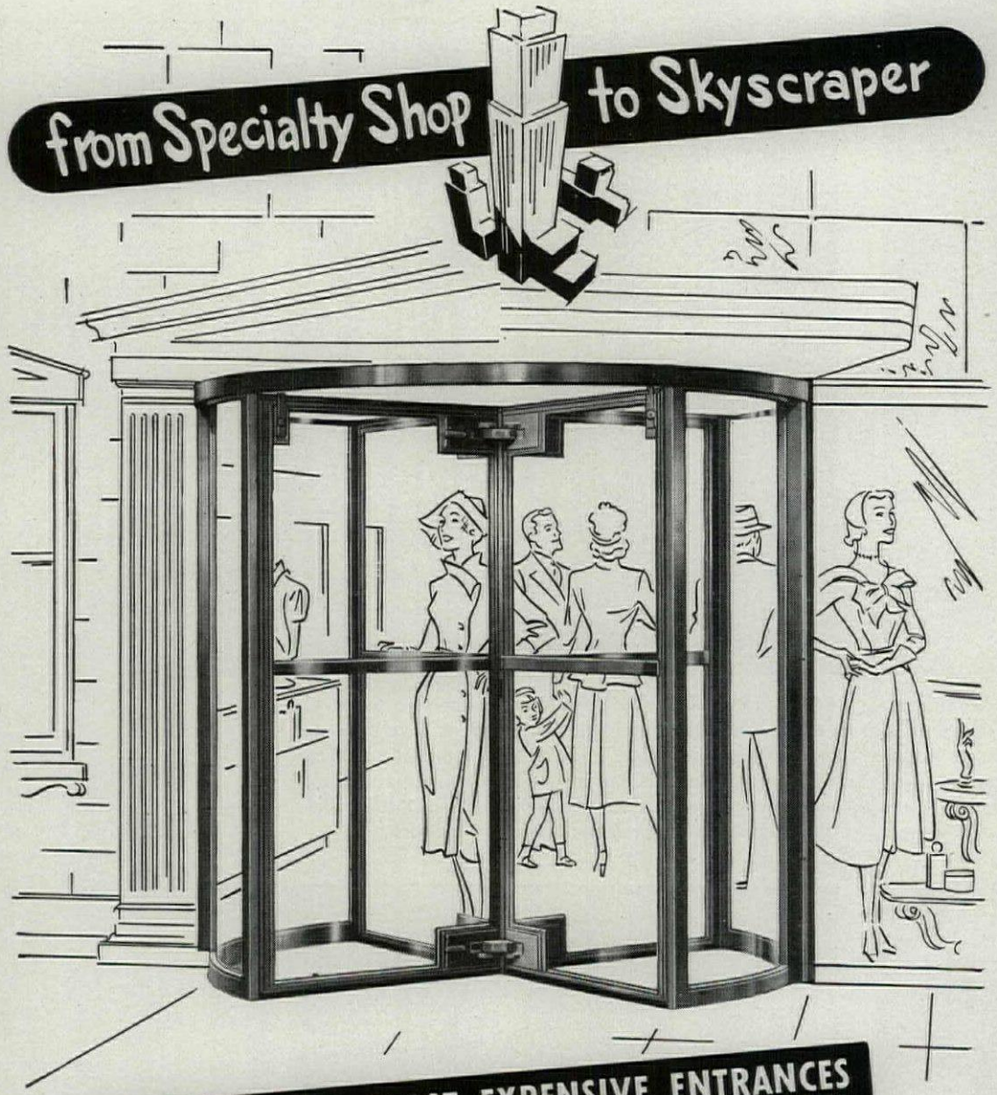


SAFE, EASY SERVICING is provided by the interlock which requires the disconnect handle of the deadfront CENTR-A-PLUG to be moved to OFF position before it can be opened . . . and by the quick-clip method of attaching the control unit to the trough which eliminates the nuisance of screws, nuts, and loose parts.

TRUMBULL (T) ELECTRIC

DEPARTMENT OF GENERAL ELECTRIC COMPANY

PLAINVILLE, CONN.



THE BEST AND LEAST EXPENSIVE ENTRANCES ARE REVOLVING DOOR ENTRANCES

Revolving doors are — "always open — always closed" — eliminate drafts, keep dust and dirt out, cut heating and air conditioning costs, permit full use of space inside the entrance, facilitate the safe, expedient movement of the heaviest in-and-out pedestrian traffic — These are reasons why the best entrances are revolving door entrances . . . why, even in many new buildings, swing doors are so frequently replaced with efficient, money-saving revolving doors. Plan ahead for revolving door entrances in the buildings on your drawing boards.

Write for new, free booklet showing the modern styles and advantages of International-Van Kannel Revolving Doors.

Periodic lubrication and an annual check are the only maintenance required for years of carefree service from revolving doors.

REVOLVING DOORS
INTERNATIONAL-VAN KANNEL

1853 EDGAR STREET EVANSVILLE 7, IND.

In Canada — International-Van Kannel Doors Are Available Through Eastern Steel Products, Ltd., in Toronto and Montreal

FOR INFORMATION CONSULT THE CLASSIFIED SECTION OF YOUR TELEPHONE DIRECTORY OR SEE OUR CATALOG IN SWEET'S.

LETTERS

GREAT ARCHITECT'S HOSPITAL

Sirs:

I appreciate the fine presentation given in your February issue to my Maimonides Health Center in San Francisco. However, I am unable to agree with your conclusions as to the cost . . . especially since the factors not considered made the comparison unfavorable with another hospital illustrated in the same issue. The very low cost of this hospital in the East excluded the price of the land as well as all fees; and . . . the unusually high proportion of double rooms was bound to produce a lower cost per bed—*but* it also represented a lower standard.

At Maimonides, the reported total cost of $1,100,000 included not only $60,000 for land but also $40,000 incurred in the provision of adequate structure and equipment for the eventual addition of three more floors (since the hospital will ultimately have 137 beds). On this basis, the cost is $1,000,000 net for 83 beds, or $12,000 per bed. This figure is very close to the national average in spite of the earthquake resistant structure and the many amenities such as balconies, patio, etc. California's Director of Public Health declared publicly that Maimonides is one of the four most economical hospitals in the state.

Also, here are certain credits you omitted, much to my embarrassment: Michael A. Gallis, AIA, is my associate; Dr. J. A. Katzive, Director of Mt. Zion Hospital, San Francisco, was Medical Consultant; Clyde E. Bentley was Mechanical Consultant.

Regarding the reference to "fantastic shell-like structures" which started my career before World War I . . . these have been of great importance in the current tendency to create architectural structures closely akin to the forms of nature. . . .

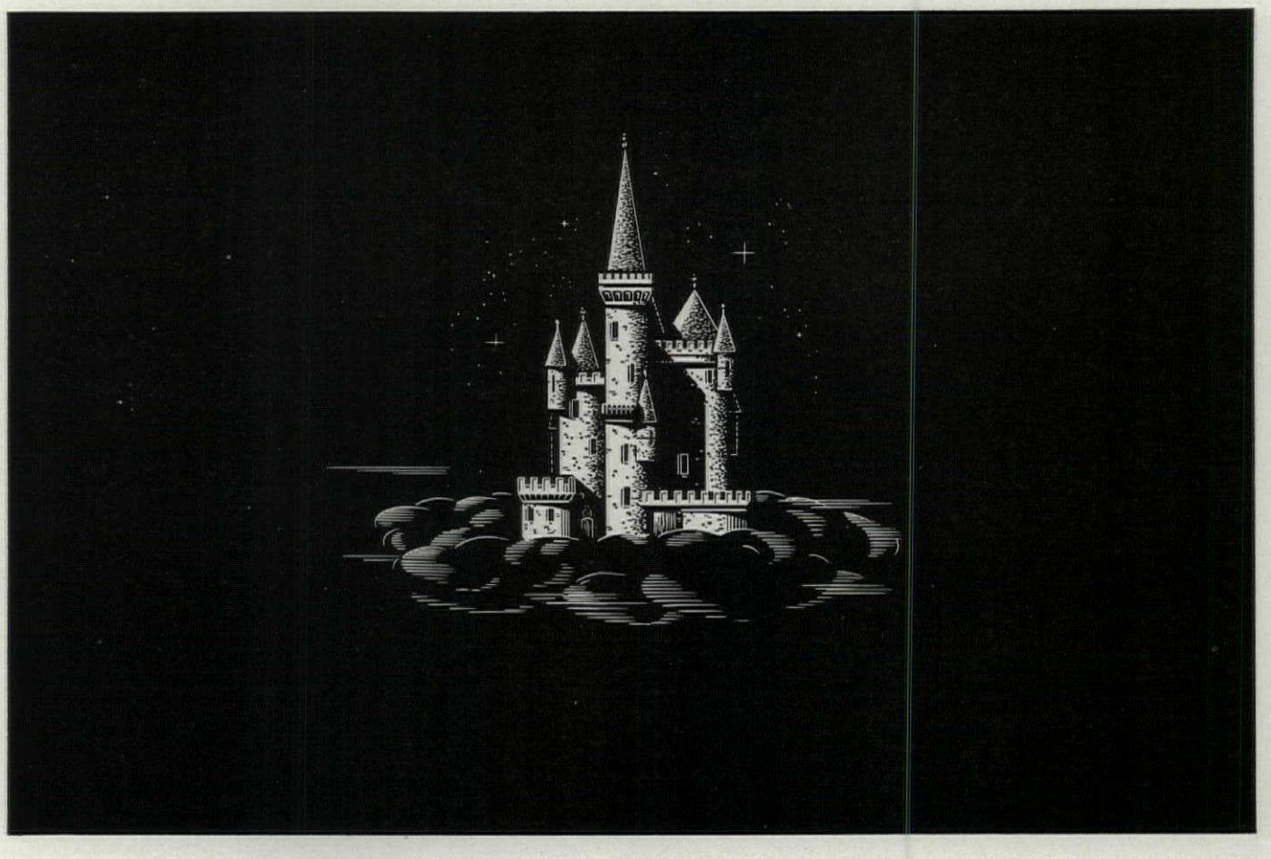
ERICH MENDELSOHN, *Architect*
San Francisco, Calif.

NEW ORLEANS' NEW SCHOOLS

Sirs:

I wish to brand your news item (Dec. '50—crediting Mrs. Jacqueline McCullough Leonhard with a major victory for new schools in New Orleans) a shameful deceit. The facts are that Mrs. Leonhard ran in 1948 on a platform endorsed by the Mayor and three newspapers in opposition to levying three mills taxation for construction of adequate school buildings as proposed by the superintendent and the then school board majority. The constitution of Louisiana was amended at that election so as to permit the New Orleans school board to levy three additional mills; two might be used for new schools. In November 1949 Mrs. Leonhard was one of two board members voting *against* the additional levy. When the action proved popular in New Orleans she voted one year later to fund two of the mills as originally proposed. . . . Had we depended on Mrs. Leonhard there would be no new building

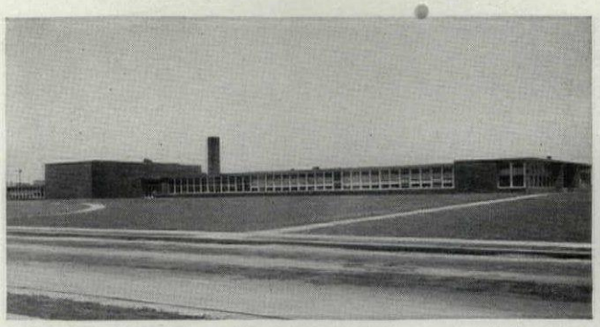
(Continued on page 102)



Here's where we live . . . *for a few minutes each day*



Eden Prairie School, Eden Prairie, Minnesota has Modu-aire Units for individually-controlled air conditioning in each room.
Architect: Herbert Crommett *Engineer:* Scott Whitnah



Abbey Lane School, Long Island, New York has an installation of Unit Air Conditioners.
Architect: F. P. Wiedersum *Engineer:* Sears & Kopf

HERE'S A PICTURE of the place where better air conditioning equipment is built . . . not with tools, machinery or steel, but with the ideas, the brains, the imagination of our designers and engineers.

We like to think of it as our "air castle". It's the place where some of the world's finest air conditioning units had their beginning. It's the place where new improvements and advancements constantly are being planned. It's a place where we continually look to the future . . . as part of each day's work.

It's another of the reasons why it pays to check with USAIRCO whenever you're looking for new and better ideas in air conditioning to put to work for your clients.

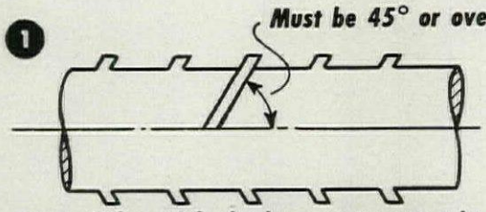
UNITED STATES AIR CONDITIONING CORP.
3305 Como Avenue S.E., Minneapolis 14, Minnesota

U.S. AIRCO
Everything In Air Conditioning

Reinforcing Bars HAVE TO BE GOOD... to meet ASTM A305

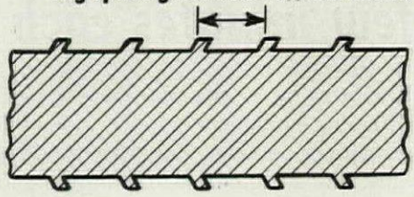
ASTM SPECIFICATION A305-50T REQUIRES

1. *Must be 45° or over*

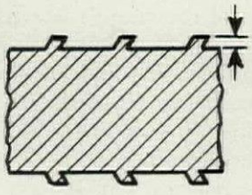


From 45° to 70°, the lugs must reverse in direction on each side or on opposite sides

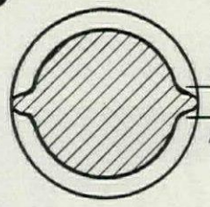
2. *Lug spacing not over 7/10 bar diameter*



3. Lug height must be at least 4 to 5% of nominal bar diameter



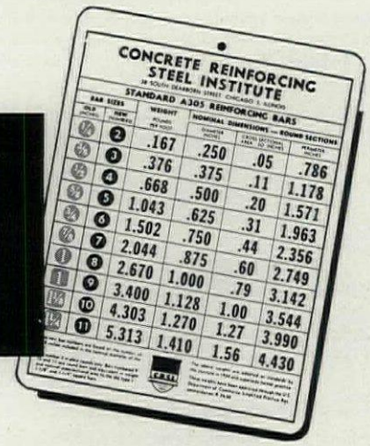
4. Gap or longitudinal rib width must not exceed 12½% of nominal perimeter of bar



When you specify reinforcing bars that meet ASTM A305-50T, you *know* these bars will have high bonding strength. For Specification A305 sets up rigid standards as to the direction, height, and spacing of lugs on the bar. Improved bars that can meet these specifications provide high bonding strength that reduces the size of tension cracks and often eliminates the need for hook anchorage.

Some codes already permit greater bonding stresses and elimination of hook anchorage when ASTM A305 bars are used. Similar changes in the ACI Building Code are awaiting final approval.

You can be assured that any bar that meets ASTM Specification A305 will make possible new economies in design, and sounder, more permanent structures. Your reinforcing bar fabricator is now offering bars that meet these standards. When indicating the size, use the new number designation. A new bar chart, covering these designations, will be sent upon request.



Write for FREE NEW BAR CARD

CONCRETE REINFORCING STEEL INSTITUTE • 38 S. Dearborn St., Chicago 3

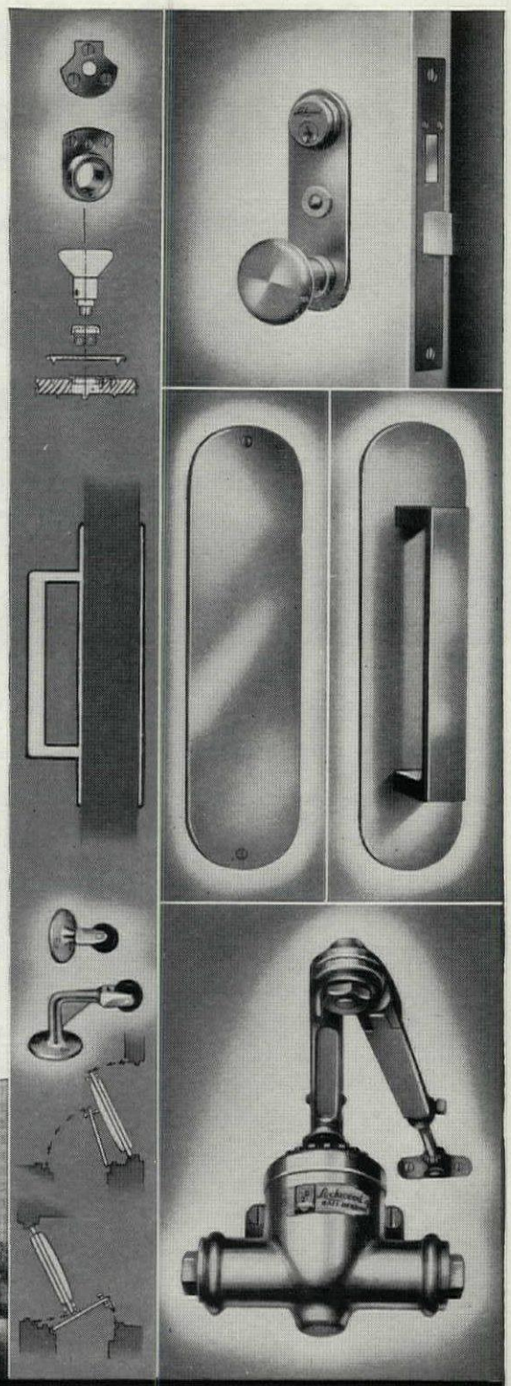
STATLER again selects LOCKWOOD FINISHING HARDWARE on PERFORMANCE

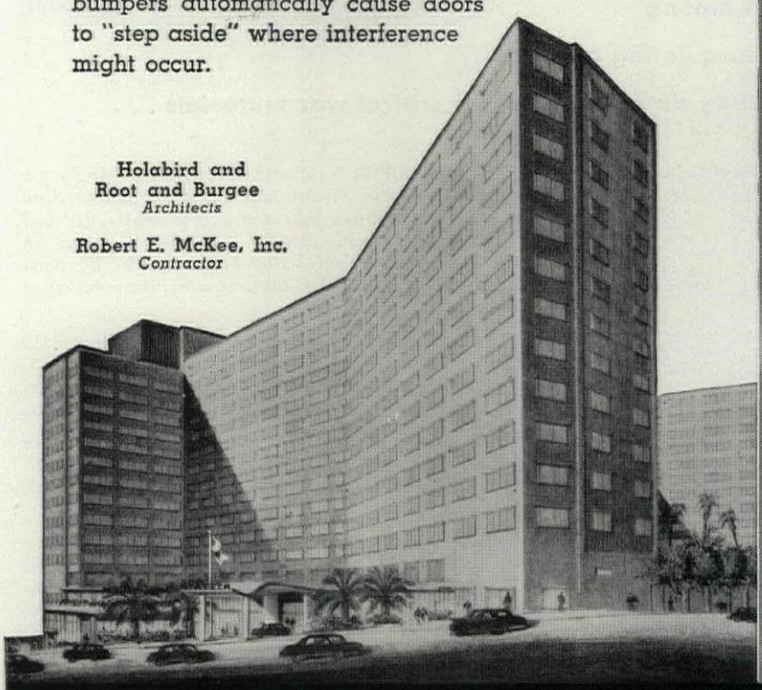
The Los Angeles Statler, new 1275 room hostelry, is another Lockwood installation in this eminently successful chain of hotels. The Washington Statler and Statler Hall (unique training ground at Cornell University for prospective hotel personnel) are Lockwood equipped and the Statlers at St. Louis, Detroit, Cleveland, Boston and New York and the Hotel William Penn at Pittsburg (Statler operated) have all been re-equipped with new type Lockwood hotel locks.

Top: An Ambassador Design guest room lockset with six important guest room features (see booklet L752) and button indicator. Concealed screw attachments. 30 master keyed groups under 2 separate grand masters.

Center: Ambassador Design door pull and push plate used on passage and service quarters doors.

Bottom: Lockwood's Ball Bearing Rack and Pinion Door Closer assures quiet and efficient door operation with a minimum of maintenance. Lockwood designed roller bumpers automatically cause doors to "step aside" where interference might occur.





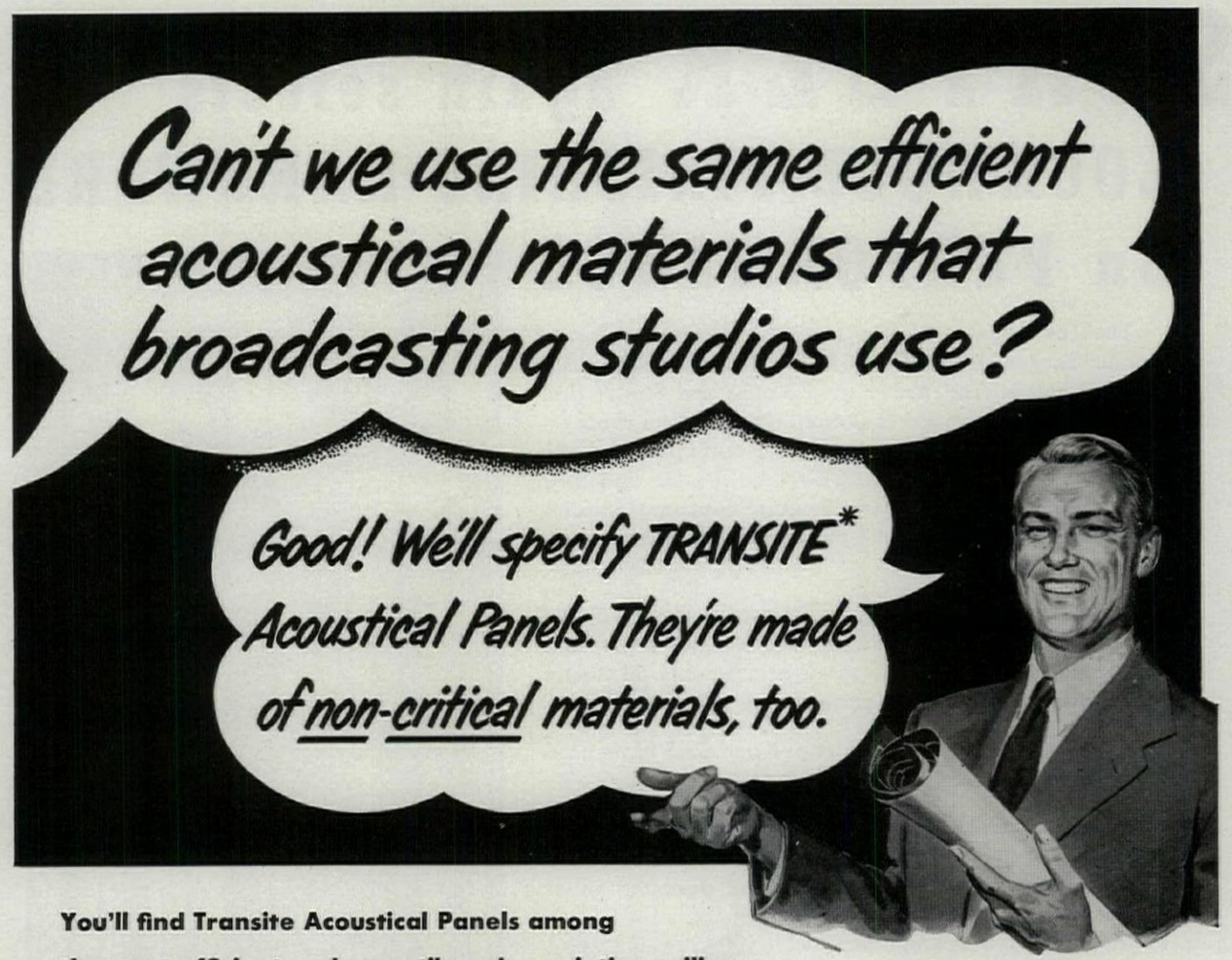
Holabird and Root and Burgee
Architects

Robert E. McKee, Inc.
Contractor

Lockwood

HARDWARE MANUFACTURING CO.
FITCHBURG • MASSACHUSETTS

FOR MORE THAN 30 YEARS OF SERVICE & PUBLIC CONFIDENCE
This Brand Name was Awarded the GOLDEN ANNIVERSARY CERTIFICATE by the BRAND NAMES FOUNDATION, INCORPORATED



You'll find Transite Acoustical Panels among the most efficient and versatile noise-quieting ceilings developed by Johns-Manville. Yet they do not depend on critical war materials . . .



These are 24 x 24-inch Transite Acoustical Panels. Notice how precisely the beveled units come together to form a ceiling that is exceptionally flat and true. Transite Panels may also be obtained with square edges when it is desired to minimize tile lines and promote the appearance of an unbroken perforated area.

● MADE OF ASBESTOS, Transite Acoustical Panels are particularly resistant to fire and moisture, and provide noise-quieting ceilings that are exceptionally flat and true. They are architecturally desirable for use in offices, hospitals, homes—and of course in kitchens and cafeterias, chemical laboratories, broadcasting studios, etc.

The panels consist of a perforated asbestos-cement Transite facing, 3/16" thick, backed up with a sound-absorbing element which is available in several thicknesses and types depending on acoustical requirements.

Six hundred perforations per square foot help to give Transite Panels extremely high sound-absorbing efficiency. The Panels are extremely durable, can be washed, painted and repainted.

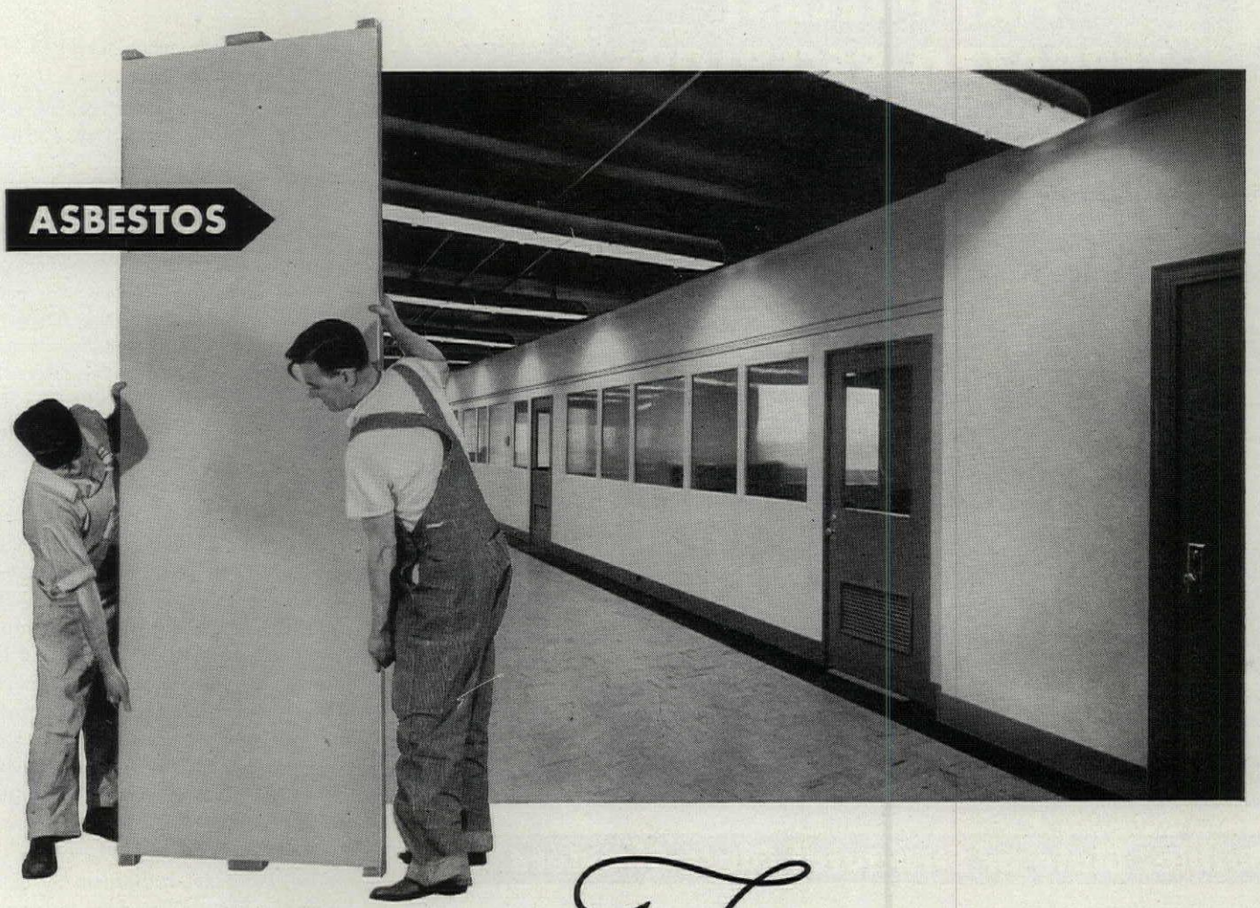
Other J-M Acoustical Ceilings include *Fibretone**, a drilled fibreboard; and *Sanacoustic** *Units,* perforated metal panels backed up with a noncombustible, sound-absorbing element. Write today for our free brochure, "Sound Control." Johns-Manville, Box 158, Dept. MB, New York 16, New York.

*Reg. U. S. Pat. Off.

JOHNS-MANVILLE JM PRODUCTS

Johns-Manville

J-M Acoustical Materials include Sanacoustic* Units, Transite* Acoustical Panels, and drilled Fibretone*



PRODUCTION EXECUTIVES, TOO, *Favor* THESE FLEXIBLE INTERIORS

"Our Asbestos Movable Walls are just as practical out in the plant as in the main office," say management men. And the "Universal" type require *no critical war materials* in their fabrication or erection.

IF YOU HAVE a problem concerning *rapid industrial expansion for military defense* or to meet civilian demand, investigate the time-saving, money-saving advantages of Johns-Manville *Asbestos Movable Walls.*

In this time of national emergency, we call particular attention to the *Universal* type of J-M Transite® Movable Wall. It uses *no critical war materials,* thus gives you more freedom to plan your construction schedule with confidence. Take advantage of prompt installation, no shortage delays.

The flush-type, asbestos-faced panels of the *Universal* walls are hard-to-mar, resist shock and abuse, are easily maintained, and possess a pleasing surface texture that enhances their attractive appearance. They go up fast, too. The sections are light, easy to locate. The "dry wall" method of erection assures speed and neatness. You can remodel occupied quarters with little or no interruption to normal routine. *Universal* type movable walls may be erected as ceiling-high or free-standing partitions and railings, either solid or with glass.

The complete Johns-Manville wall, including doors, windows, and hardware, is installed *by* Johns-Manville; you get *undivided responsibility.* An estimate will convince you that the cost of J-M Movable Walls compares favorably with that of other types of wall construction.

TRANSITONE Movable Walls—A recent and unique development of the Johns-Manville laboratories is the Transitone Movable Wall, with asbestos panels *integrally colored.* Nonfading pigments are blended into the asbestos fibres, thus eliminate the cost of periodic decorative treatment. The color goes *all the way through each panel.*

• • •

For details about J-M Movable Walls, consult your Sweet's Architectural File, or write Johns-Manville, Box 158, Dept. MB, New York 16, N. Y.

JOHNS-MANVILLE JM PRODUCTS

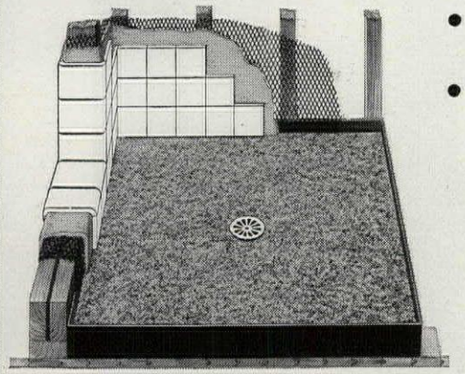
Johns-Manville Movable Walls

INSTALLED NATIONALLY BY JOHNS-MANVILLE

FIAT PRECAST TERRAZZO RECEPTORS

— AVAILABLE, not restricted under the defense program

For Tile Showers



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.

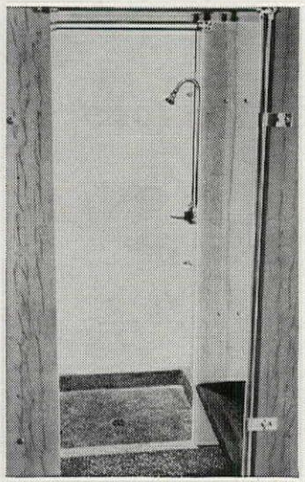
- **Eliminates the difficult lead pan.**
- **Saves construction time and cost.**

Gives a beautiful solid floor that reduces the possibility of wall cracks because the receptor is not affected by shrinkage of supporting wood framing or settling of the building.

Flat type for tile

STANDARD SIZES —
Square type, 32" x 32" — 36" x 36" — 40" x 40"
Corner type, 36" x 36" — 40" x 40"

For Marble, Slate or Structural Glass Showers



Fiat precast terrazzo receptors are the accepted standard floor for this type of wall construction, either single or battery arrangements.

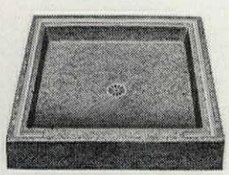
Flat type for marble, slate or structural glass.

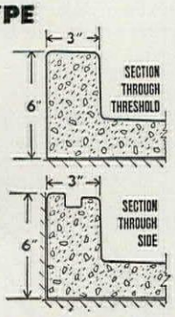
STANDARD SIZES —
Square type, 32" x 31" — 36" x 35" — 40" x 39"
Corner type, 36" x 36" — 40" x 40"

Rabbeted type for marble, slate or structural glass

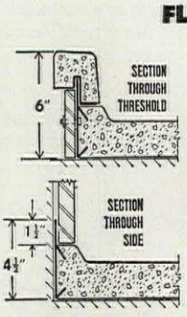
STANDARD SIZES —
Square type, 36" x 36"
Dual type, 72" x 36"

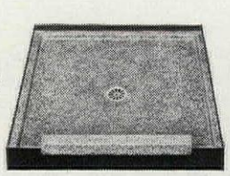
RABBETED TYPE





FLAT TYPE





FIAT METAL MANUFACTURING COMPANY
Three Complete Plants
9301 W. Belmont Ave., Franklin Park, Ill.
Long Island City 1, N. Y. Los Angeles 33, Calif.
In Canada—Fiat showers are made by Porcelain and Metal Products, Ltd., Orillia, Ontario

LETTERS

going up for the school children of this city. I can supply affidavits. . . .

ROBERT M. HAAS, *Past president*
New Orleans Parish School Board

• Reader Haas fails to mention that the specific votes he mentions were tied in with political questions involving home rule for New Orleans and the right of local referendum. Mrs. Leonhard did indeed spark the campaign for up-to-date schools in New Orleans; Mr. Haas consistently referred to schools of the new kind as "cow sheds" and voted against the bond issues needed to finance them. New Orleans voters seem to have sided with Mrs. Leonhard who has written the letter presented below.—ED.

Sirs:

Charles R. Colbert, the architect who did so much to start New Orleans architects on their advocacy of modern schools, has been named "Supervising Architect for Planning and Construction." He will 1) recommend locations and sites for all new schools in our $25 million program; 2) program the schools so as to expedite their design by private architects; 3) supervise all renovation and major repairs to existing structures; 4) direct research on population trends and other long-term trends; 5) keep an eye on economy.

Also, Pat Sinclair Bornemann of the *New Orleans Item* should be added to your list of effective fighters for new schools.

JACQUELINE LEONHARD, *President*
New Orleans Parish School Board

THE POOR LIBRARIANS

Sirs:

May I ask you, please, before you decide on the change in name of your magazine, to think of the poor librarians and others who so much dislike having to alter their records and place marks. . . .

R. F. KENNEDY
City Librarian
Johannesburg, South Africa

• Although the name has been changed to THE MAGAZINE OF BUILDING, librarians and others who still wish to use the old name may take comfort in the fact the words "ARCHITECTURAL FORUM" still precede the name in the magazine's logotype.—ED.

SUNSHADES IN CANADA

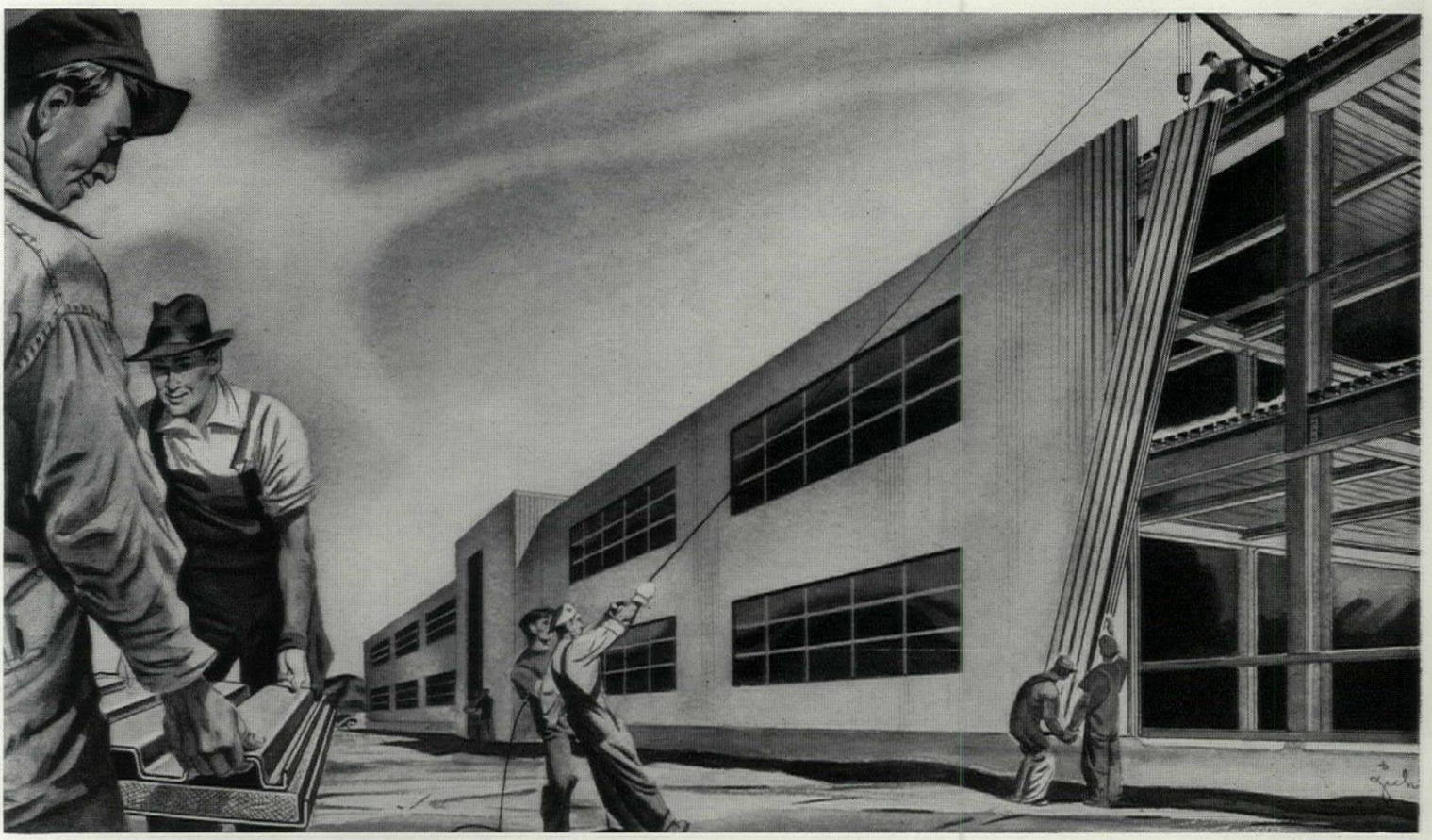
Sirs:

The article on sunshading in the March issue is excellent. . . .

The technique of sunshading has been used in Canada but, as the article proves, this can easily be overdone. . . . More widespread use of such information as this will help to keep a practical idea like sunshading from becoming merely a fad.

ERIC W. THRIFT, *Director*
Metropolitan Planning Commission
Winnipeg, Canada

your building can go up as QUICK!



Every feature of a Q-Panel suits it perfectly for laboratories, research buildings, powerhouses and administration buildings—in fact, for all the types of plants now needed for expansion.

Q-Panels go up fast—50 sq. ft. of insulated wall every 9 minutes; a small crew quickly attaches the panel to the steel framework. Little blocks don't pile up fast. *It's much quicker to hang a wall than to pile it up.*

Q-Panels are prefabricated. This eliminates most of the uncertain conditions accompanying conventional field erection. In spite of the light weight of thin insulated curtain wall (6% of a conventional 12" masonry wall) its insulation value is greater.

Some of the most beautiful buildings of this decade have been designed in Q-Panel. Architects have used various fluted surfaces to produce light and shadow patterns. The metal surfaces, or Galbestos if you wish, are maintenance-free, durable. Quick construction is probably uppermost in your mind right now, but the excellence of Q-Panel and its attractiveness and its maintenance-free nature are qualities you will appreciate over the years.

Consult your architect and write us for FREE LITERATURE which explains the details and shows examples of Q-Panel buildings both large and small. Write for catalog on

Q-PANELS

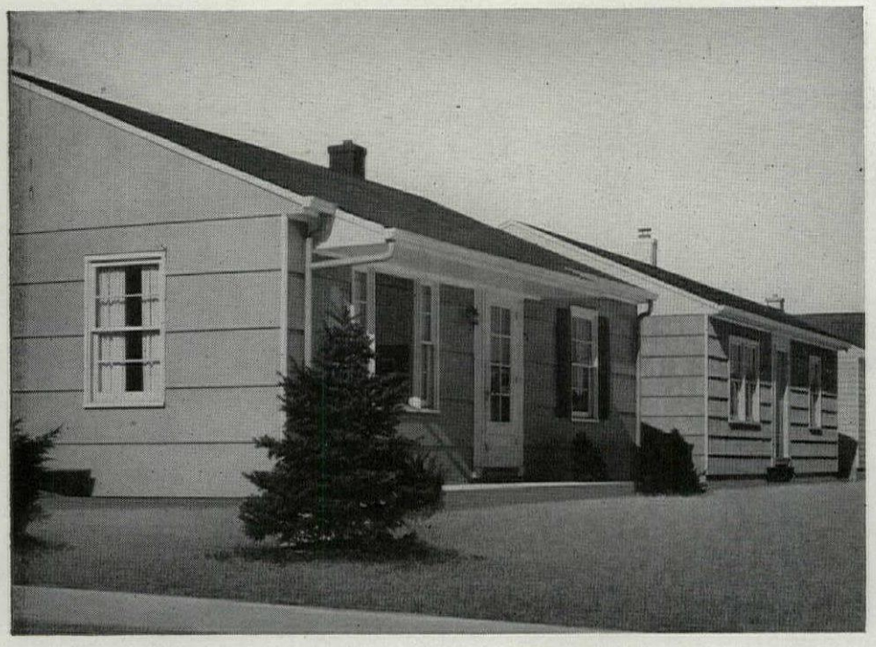
H. H. ROBERTSON COMPANY

Factories in Ambridge, Pa.; Hamilton, Ontario; Ellesmereport, England

2403 Farmers Bank Building
Pittsburgh 22, Pennsylvania

Offices in ALL Principal Cities in the U. S. A. and Canada

World-Wide Building Service



"P & H HOMES," prefabricated by the Harnischfeger Corporation, Houses Division, Port Washington, Wisconsin, are built for permanence. Important structural members are preserved with Monsanto Penta.

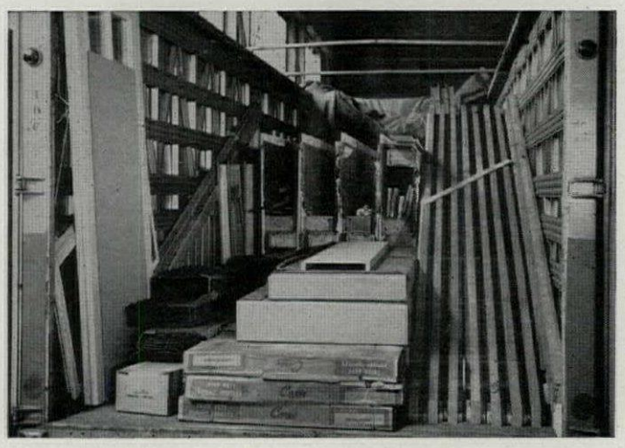


BUILT ON ASSEMBLY LINES, "P&H Homes" are 83% completed when shipped. They can be erected with only 155 hours of on-the-site labor. Harnischfeger production is geared for developing communities.



Idea for defense building

DIMENSIONAL STABILITY, important in prefabrication, is assured by water-repellent formulations of Monsanto Penta. Photo shows workmen assembling trusses and gables.



SEMITRAILERS carry "P & H Homes" to the spot where they are erected. These homes mean housing in a hurry, plus economy and long life with penta-treated wood.

Build with speed, but build for permanence. That's the idea behind "P & H Homes," which have important structural members, gables, siding and trim treated with Monsanto Penta, the *permanent* wood preservative. It's a basic idea, because defense housing is needed immediately and experience has shown that most such projects become permanent communities.

Water-repellent formulations containing Monsanto Penta (pentachlorophenol) provide dimensional stability so important in prefabricated structures. Penta treatment protects against termites and other insects that attack wood. Penta prevents decay due to fungi. Monsanto Penta can be formulated in *clean* treatments so that the wood can be painted or varnished. Years of service prove that penta gives enduring protection because it is a stable chemical and does not leach nor dissolve in rain or ground water.

Whether you're building a home or a hangar . . . a platform or a pavilion . . . you can put longer life into the structure with Monsanto Penta. For information on Monsanto Penta and for sources of supply of penta formulations or penta-treated lumber, contact the nearest Monsanto Sales Office or write MONSANTO CHEMICAL COMPANY, Organic Chemicals Division, 1752-E South Second Street, St. Louis 4, Missouri.

DISTRICT SALES OFFICES: Birmingham, Boston, Charlotte, Chicago, Cincinnati, Cleveland, Detroit, Houston, Los Angeles, New York, Philadelphia, Portland, Ore., San Francisco, Seattle. In Canada, Monsanto (Canada) Ltd., Montreal.

MONSANTO
CHEMICALS AND PLASTICS

SERVING INDUSTRY . . . WHICH SERVES MANKIND

AMERICAN-Standard

First in heating...first in plumbing



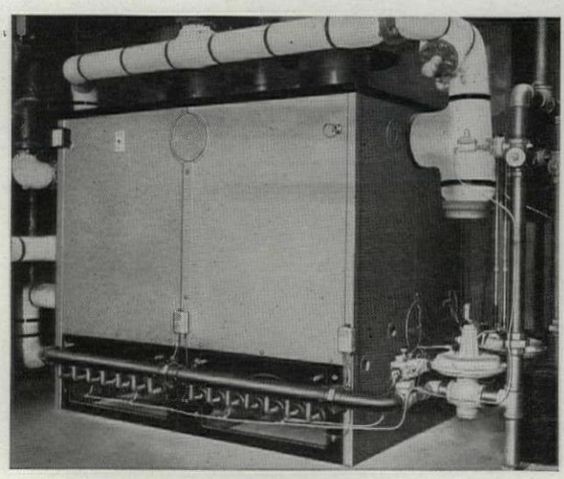
Hollywood's Hotel Roosevelt selects AMERICAN-Standard products for its $1,000,000 Resort Wing

When the luxurious Resort Wing recently was added to the Hotel Roosevelt of Hollywood, California, American-Standard Heating Equipment and Plumbing Fixtures were installed . . . assuring an added measure of comfort and convenience for guests of the hotel—Hollywood's largest.

Handsomely-styled American-Standard products have proved their durability, ease of maintenance, dependability in service, and economy of operation in all types of installations. Whatever your building or remodeling plans call for, you'll find the *right* products for the job in the *complete* American-Standard line.

CONVENIENCE AND GOOD LOOKS are combined to give utmost guest-appeal to this Hotel Roosevelt bathroom. A genuine vitreous china lavatory, set in a counter-top cabinet, is an outstanding feature of the room. The Tribor Water Closet, with siphon jet flushing action and extra large waterways, is also made of permanently non-absorbent, genuine vitreous china. The Master Pembroke Bath is made of rigid cast iron, finished with a smooth coating of easy-to-clean, hard-to-mar enamel and features low sides, wide front rim, and a flat bottom for greater comfort and convenience and added safety.





Architect: Frank W. Green, Glendale, Calif.
Mechanical Engineer: Robert Ring, Ontario, Calif.
Plumbing and Heating Contractor: H. E. Murray Co., Los Angeles, Calif.
Wholesale Distributor: Herco Pipe & Supply Co., South Gate, Calif.

ABUNDANT, AUTOMATIC HEAT is supplied the new wing of the Hotel Roosevelt by this Standard Gas Boiler. The heavily insulated jacket of the Standard Boiler prevents excessive heat loss. And the carefully machined cast iron sections of the boiler are gas-tight, safe. Heating surfaces, burners, controls and other essential features are coordinated for high heat output with low operating and maintenance cost.

American Radiator & Standard Sanitary Corp., P. O. Box 1226, Pittsburgh 30, Pa.

Serving home and industry

AMERICAN-STANDARD · AMERICAN BLOWER · CHURCH SEATS · DETROIT LUBRICATOR · KEWANEE BOILERS · ROSS HEATER · TONAWANDA IRON



Floors that add to the architectural beauty of interiors can be achieved on a limited budget with Armstrong's Asphalt Tile. Regular colors are now augmented by "Designer's Palette" Series E colors with muted tone-on-tone marbleizing. In either style, Armstrong's Asphalt Tile offers outstanding beauty at low cost.

Employees' Lounge
John Hancock Building, Boston, Mass.
Crum & Ferguson, Architects

ARMSTRONG'S ASPHALT TILE

ARMSTRONG CORK COMPANY · LANCASTER, PENNSYLVANIA



Think

ABOUT YOUR FUTURE IN BUILDING!

Study this 3-point plan for solving your home-building problems . . .

1. SPEED OF ERECTION (under roof in one day).
2. COMPLETE HOME PACKAGE (Except plumbing, wiring, masonry).
3. MINIMUM SKILLED LABOR REQUIRED IN THE FIELD (simple, easy, standardized modular panel construction).

Gunnison Homes are erected in the field in half the time . . . with half the labor . . . without the headaches and uncertainties of conventional building!

For further information, write Dept. A-13
Gunnison Homes, Inc., New Albany, Ind.

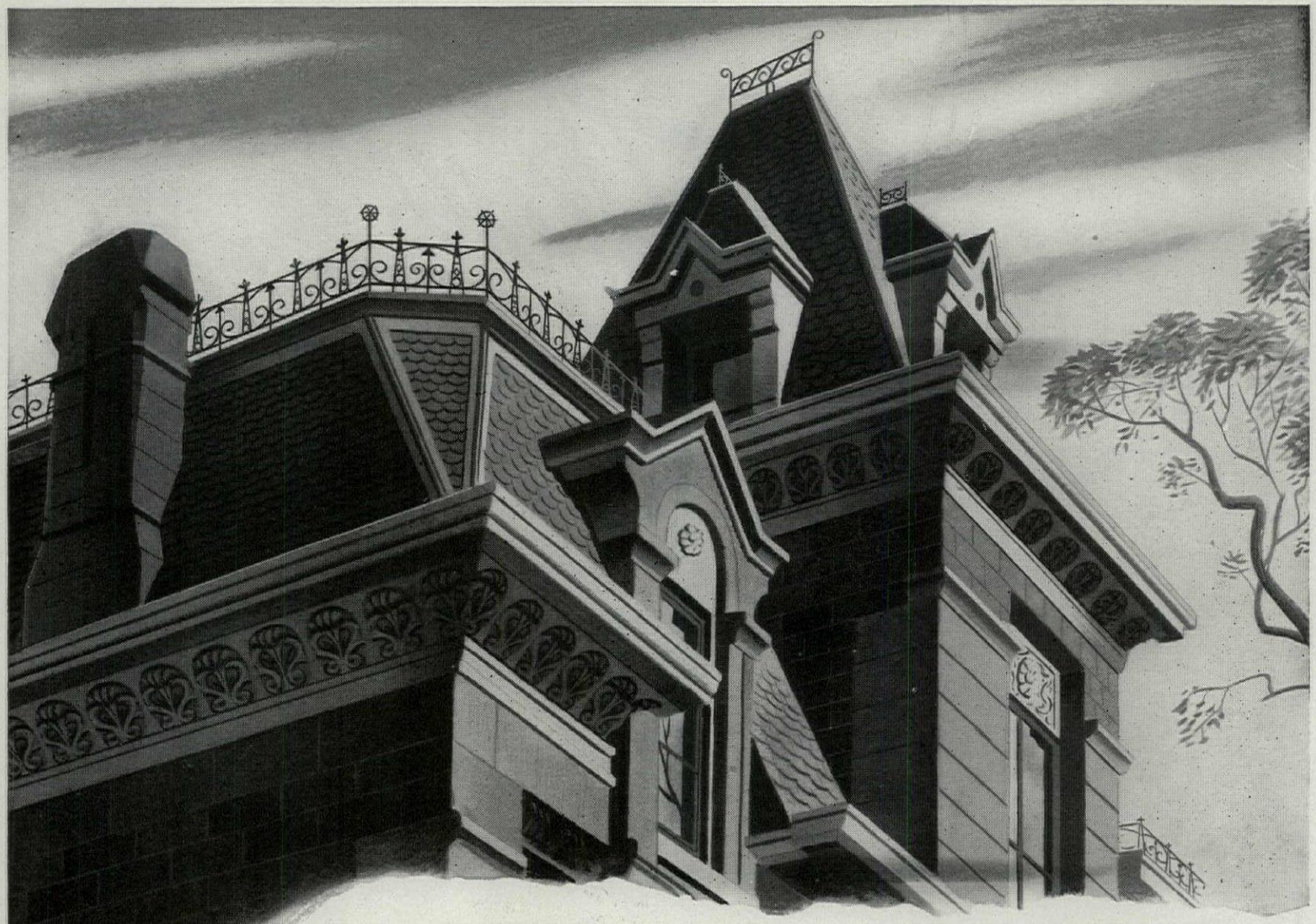


GUNNISON HOMES INC. · USS · FINEST HOMES SINCE 1936 · UNITED STATES STEEL

Manufacturers of Gunnison *Coronado* and CHAMPION Homes

Gunnison Homes INC.
UNITED STATES STEEL (US) CORPORATION SUBSIDIARY
NEW ALBANY, INDIANA

"Gunnison," "Coronado" and "Champion"—T.M. Gunnison Homes, Inc.



Still **paying fancy prices for fancy?**

Wrought iron trim and curlicues were never standard. People who fancied them paid plenty for extra time, labor and materials. It's enough to turn your wallet pale to think what they'd pay at today's rates.

Yet right now some people are paying terrific prices (and absorbing hidden costs) for "modern" building materials and methods that are just as outmoded and fanciful. And your wallet may be a shade whiter right this minute.

So take this idea and put it to *work* for you: There are standard structural metal panels that make buildings grow by *areas* instead of by *inches.* Panels that are ceiling and silencer and roof *in one package.* Panels that let you zip up outside walls—then down and up again farther out to make your building bigger.

There are standard metal doors that come complete with frames and hardware . . . prefitted to get together in a hurry. Doors that can't warp or swell. Or shrink. Or splinter.

There are standard steel windows of modular sizes that can be easily combined into whole walls of daylight and ventilation. Windows that *control* fresh air. Windows that are Hot-Dip Galvanized in a specially designed, automatically controlled new Fenestra plant—windows that put new meaning in the term "maintenance-free."

Thse Fenestra* Building Products are engineered in standard types and sizes to cut the waste out of building.

And the savings are *really* fancy.

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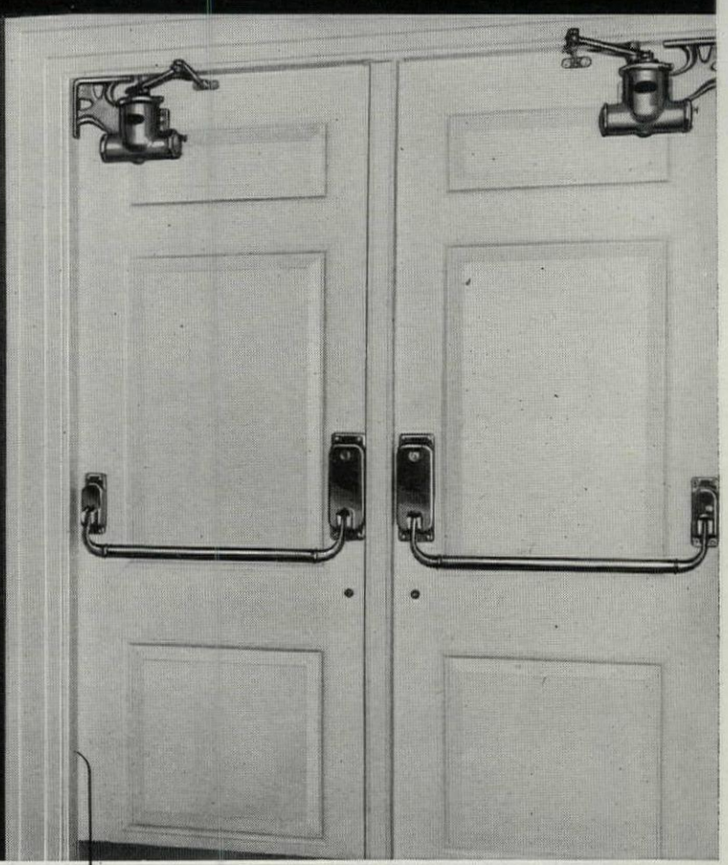
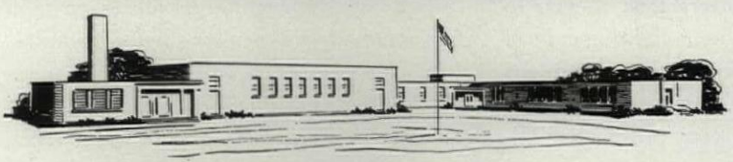
engineered to cut the waste out of building

CORBIN School Hardware that Passes the Test of Time



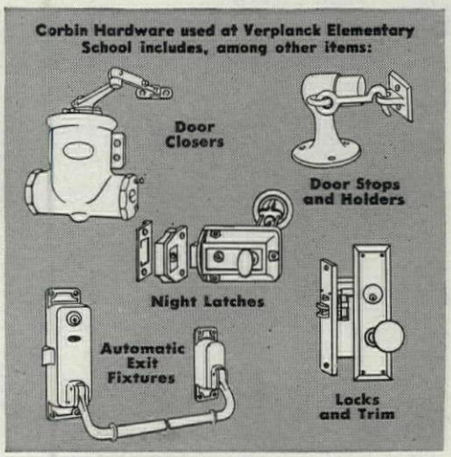




Verplanck Elementary School is the larger of two elementary schools opened last September in fast-growing Manchester, Conn. Designed for 660 pupils through Grade 6, it contains 18 regular classrooms, 2 kindergartens, library, cafeteria with kitchen, auditorium-gymnasium, general activities room, combination play—scout activities room, 2 teachers' rooms, nurses' suite, principal's office and conference room. ***Architect:*** Keith Sellers Heine, Hartford; ***Contractor:*** The Alexander Jarvis Company, Manchester; ***Corbin Hardware Supplied By:*** F. T. Blish Hardware Company, Manchester.

Schools are designed and built to serve for many years. So is Corbin Hardware. That's why so many fine new schools, like the Verplanck Elementary School in Manchester, Connecticut, rely on Corbin for their hardware needs.

From the safety of Corbin Automatic Exit Devices to the durability of our Butt Hinges, you will find that Corbin Hardware meets all of the specialized needs for the smooth flow of school traffic. Corbin Hardware makes an economical installation, too, because it requires little or no maintenance to provide year after year of quiet, trouble-free service.



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DIVISION

THE AMERICAN HARDWARE CORPORATION, NEW BRITAIN, CONNECTICUT, U. S. A.





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Prospective home owners look to you to show them improved home lighting control . . . that's why they welcome up-to-date plans with General Electric mercury switches.

Every day more of your prospective clients learn about the extras of mercury switches through national consumer advertising and the proud recommendations of their friends. Silent, click-free operation and especially long service are the talking points that appeal to them. They expect the modern touch of G-E mercury switches in the homes you plan for them.

In homes, in hospitals, in offices, write in G-E mercury switches for silence. In industrial construction, specify them for durability. They have no moving contact blades to wear or burn out—a pool of mercury smoothly makes and breaks the circuit. Single-pole, double-pole, three-way, and four-way for 125 volts and 10 amps, or 250 volts and 5 amps. Put this modern touch in your specifications now.

Section D73-54, Construction Materials Department, General Electric Company, Bridgeport 2, Connecticut.

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ADVERTISED IN TIME THE WEEKLY NEWSMAGAZINE

Will the courts enforce waste?

A new way to attack compulsory waste is being worked up by the prefabricators.

They propose to challenge the legality of various senseless code provisions by hailing would-be enforcers to court on writs of mandamus. In a first case the court has upheld the prefabricators' contention that the community has no authority to impose unreasonable building standards. In other cases officials have backed down rather than risk a court test.

Legal basis for all codes is the state's police power to protect the health and safety of the people. Code provisions which do contribute to health and safety (as most of them do) are unquestionably legal. But what about "fire-protection" code provisions beyond what even the fire underwriters ask and "health protection" requirements which the American Public Health Association (see page 112) finds "quite impossible to justify on any valid health basis." For example:

On what legal basis can Miami expect the courts to enforce a $50-a-room waste for conduit on low voltage light switching?

On what legal theory can the Chicago courts enforce the dry wall construction vetoes filibustered into the new Chicago code by the plasterers' union?

By what right does Salt Lake City require the waste of 75 lbs. of critical lead in every house to calk the cast iron plumbing joint?

On what legal basis can every city in the country enforce the waste of $100,000,000 a year or more for vents which are again exposed as quaint anachronisms this month (see page 112) by the Public Health Association?

For that matter, how can any city enforce, on the pretext of protecting the public health, any plumbing code requirement in excess of the standards set by the new national plumbing code, which the Public Health Association declares "the absolute maximum any community is justified in requiring"?

Said the frustrated Miami architect whose client was victimized by the requirement of conduit on bell wire: "What could I do? It would have taken three years to take the building inspector to court. My client couldn't wait that long for his house, and his saving if he won would not have paid his lawyer's bill."

In that sentence lies one big explanation of why codes are so seldom challenged. Though their worst provisions cost the home buying public at least $1 billion a year in sheer waste, and though they cost each individual home buyer at least $1,000 for which he gets no benefit, still it is not profitable for any individual home buyer to stand up for his rights in court. And so code requirements of highly doubtful legality are enforced by default.

Fighting code abuses is not a job for individual home buyers. It is a job for trade associations and volume builders. On 4,000 houses Bill Levitt could have saved his

home buyers a quarter of a million dollars by ridding Levittown of a single foolish code requirement—the $65 every home buyer now has to pay for a useless house trap. That is big money—more than enough to make it worth his while to challenge the code.

Perhaps the best place to make a court test would be on the model house NAHB plans to erect near Washington to demonstrate how much more house the home builders could offer for how much less money if they were freed from code-enforced waste. This house is being designed to dramatize the issue by Architect John Highland, Vice-Chairman of the AIA committee on architect and builder collaboration, and Architect Carl Lans, director of the NAHB's technical service department. The seven codes around Washington are about as bad as any and as full of provisions whose legal foundations are highly questionable.

A court victory over code-enforced waste on this waste-cutting demonstration house might attract nation-wide attention and set a nation-wide pattern. If NAHB will make this house a real test case, this magazine will gladly contribute $1,000 to the war chest.

Waste vs. Health.

Public Health Association joins attack on code-enforced waste, especially in plumbing—wants savings used to raise standards of space, light, noise control and equipment

Almost every code-enforced waste in building is defended as somehow necessary to health and safety. In fact, there is no legal basis for any local building code other than the community's right to protect the health and safety of its citizens.

This defense of waste for the sake of health gets short shrift this month from the American Public Health Association. Its new report on *"Construction and Equipment of the Home"** climaxes in a "helpful analysis" of the code situation which the foreword correctly and somewhat proudly describes as "devastating".

This analysis pulls the rug right out from under the waste for health argument. Urges APHA: The money now wasted by codes, especially plumbing codes, could much better be spent for other health purposes. Too many of them "involve needless expense . . . unreasonably increase the cost of home building . . . deter standardization . . . are too limited and rigid to permit desirable economies made possible by new methods and materials." On the other hand, *"most of them lack any provision for many essentials of healthful housing."*

Page after page of APHA's report reads like a medical paraphrase of the Round Table report on *Waste in Home Building*—with particular emphasis on its plea that "the more waste we can take out of the house the more quality and livability we can build back into it (THE MAGAZINE OF BUILDING, Feb. '51, p. 116, April p. 102)". Says APHA: "The replacement of archaic and conflicting building and plumbing codes . . . would go far towards providing the funds required to meet all neglected needs for (more) space and . . . equipment . . . (better) site planning, heating, lighting, noise control and safety."

The APHA report touches on many of the wastes scored by the Round Table, including "the over-design of all structural members" and the code obstacles to the savings offered by "basementless houses, now demonstrated to afford safe and comfortable living conditions" and "prefabricated chimneys with decreased fire hazard and better draught characteristics" than masonry ones.

Inadequate HHFA room standard sizes are also strongly criticized as a menace to health. Says APHA: "The family life and emotional health of a large proportion of our population is seriously menaced because the mortgage pattern set up by Congress virtually dictates the construction of undersized two-bedroom units."

"The frustration which results from overcrowding, or conflict between the desires and needs of various members of the family, are health menaces quite as serious as poorly heated rooms or stairs without railings."

But the Health Association reserves its heaviest attack for the code which most laymen might consider first in importance to health—plumbing. The average home would be a far healthier place, says APHA, if the money now wasted by archaic plumbing codes were spent for more adequate room standards, for better lighting to protect the family's sight, for better noise control to protect the family's nerves, or for better household equipment to lessen the fatigue of housework.

"Our plumbing codes", says APHA, "are still markedly influenced by the fallacious Nineteenth Century belief that disease was caused by gaseous miasmas . . . sewer air does not cause disease among employees in a sewage plant. Intestinal disease germs are never airborne but are, in fact, detached with some difficulty from moist surfaces. Many codes still in force date back to the 1870's and contain provisions which are wholly unjustifiable on health grounds and involve quite needless construction costs. *(Continued on page 254)*

* *Construction and Equipment of the Home.* The American Public health Assn., Committee on the Hygiene of Housing, Subcommittee on Construction and Equipment. Public Administration Service, 1313 E. 60 St., Chicago 37, Ill., 74 pp. 8½ x 11". $2.50

How to save 30% on steel. An Engineer documents the Round Table's conclusion that welding and 24,000 lb. stresses would pay off handsomely

Not 10%, but 30% of all the steel now used in a typical riveted steel frame commercial building could be saved by a judicious combination of higher allowable stresses, field welding and rigid frame design. Furthermore, the saving in tonnage would be translated into a 12 to 15% saving in dollars today and into a still larger dollar saving if steel fabricators had more familiarity with welding and therefore were willing to translate into money the tonnage economy offered by welding reinforcing plates to the ends of the beams and girders.

So says Baltimore Structural Engineer Van Rensselaer P. Saxe, in commenting upon the Round Table recommendations (THE MAGAZINE OF BUILDING, Mar. '51, p. 163) that welding plus higher stresses offer a far better way to meet the shortage of structural steel than the threatened further cuts in construction.

To document his 30% figure, Engineer Saxe detailed five schemes for a typical 21 x 20′ bay. (While each bay is comprised of two girders and four beams, the tonnage *per bay* used in all of Saxe's comparisons is calculated on the basis of one girder and three beams in each bay; the remaining girder and beam are actually parts of adjoining bays.) A conventional riveted job, he shows, would require 3,504 lbs. of beams and girders per bay plus 164 lbs. of connections; an advanced welded design utilizing 24,000 lbs. stresses would require 1,883 lbs. of beams and girders per bay plus 74 lbs. for the weld—a net saving of more than 45% in horizontal steel. Since the horizontal steel in a building normally outweighs the vertical steel 2 to 1, this saving in horizontal steel means a saving of about 30% in the total framing steel.

Said Round Table member R. R. Graham, district engineer for the American Bridge Co.: "If Saxe says that, it's so. He has had a great deal of experience on welded steel jobs and knows what he is talking about."

In the table below Example A sets up, as a basis for comparison, the beam and girder tonnage required by standard riveted construction. This requires 3,504 lbs. for one girder and three beams. The tonnage savings offered by welding alone (with no change in design) are too small to justify a separate example. They would be hardly more than the 90 lb. savings in the weight of connections (which are not included in any of the examples).

Example B shows the saving offered on the same riveted design by higher steel stresses alone (i.e., if standards were raised and codes modified to allow 24,000 lbs. per sq. in. instead of 20,000 lbs. per sq. in.). It requires 2,775 lbs. of steel per bay—a saving of 21%.

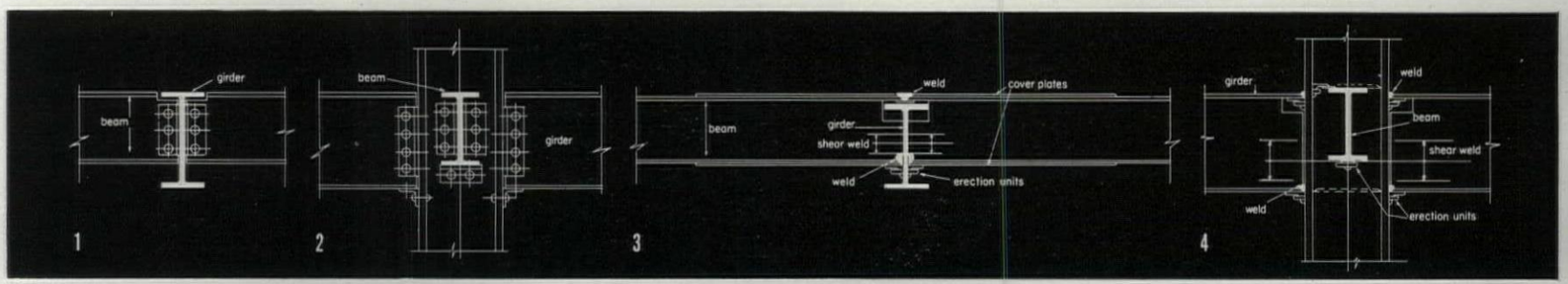
Example C shows how the real savings from welding begin when the engineer takes advantage of the greater economy of welding for rigid connections to design a continuous span. This cuts the steel to 2,550 lbs. per bay, 27% less than Example A. Much of this saving is because the continuous span shifts the point of greatest stress close to the column, where 24,000 lbs. per sq. in. stresses are already permitted by AISC standards and by most local codes, including New York City's. In other words, Example C is legal; Design B is not. In dollars Engineer Saxe says C is today the most economical design (see below).

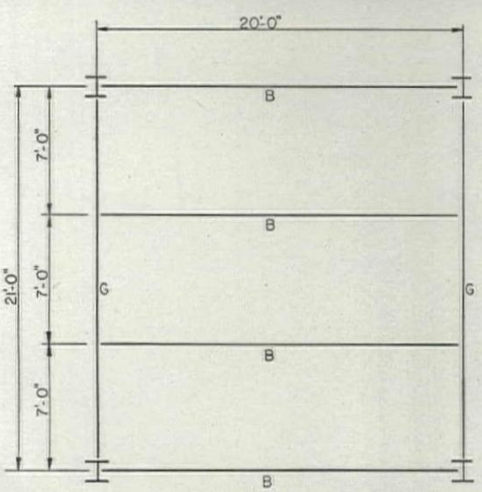
Example D shows how the 27% tonnage saving in Example C can be run up to 40% by welding small (2½″ x ¼″ x 3′) reinforcing plates to the ends of all flanges at the point of maximum stress near the connection. (These plates weigh 6½ lbs. each, 104 lbs. per bay.) They make it unnecessary to waste steel over the full length of beam or girder to get adequate strength at the ends, cut the weight of each girder 184 lbs., of each beam 94 lbs. (compared with C) and reduce the total beam and girder weight per bay to 2,084 lbs.—40% under A and 18% under C.

Example E shows how these savings could be further increased by raising allowable stresses at the center of the span (positive moment) to the same 24,000 lbs. as at the ends (negative moment). With heavier plates (65 lbs. for each girder, 38 lbs. for each beam, compared with 26 lbs. for each in D), this design would permit a further net saving of 38 lbs. on each beam, 87 lbs. on each girder, reduce the total per bay to 1,883 lbs.—a full 46% under Design A and 10% under D.

Wind loading was left out of the calcula-

(Continued on page 234)



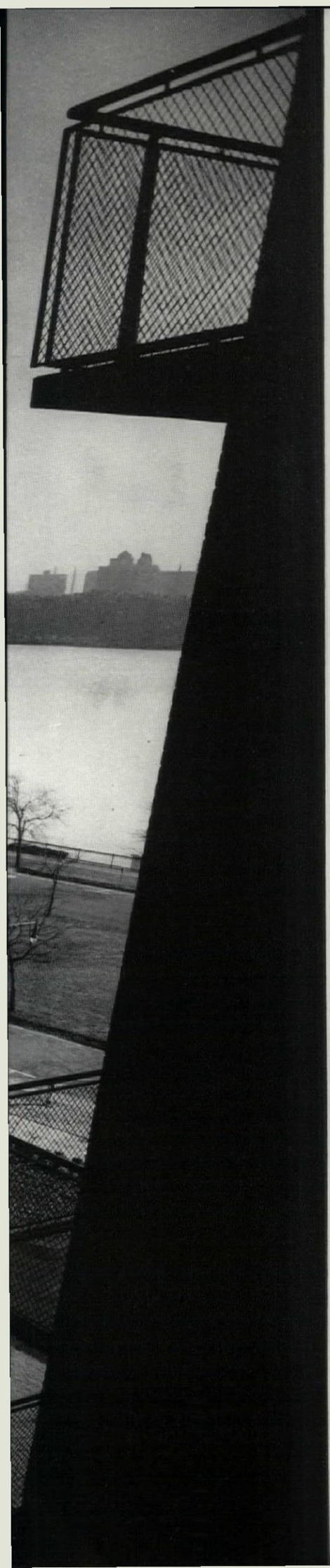


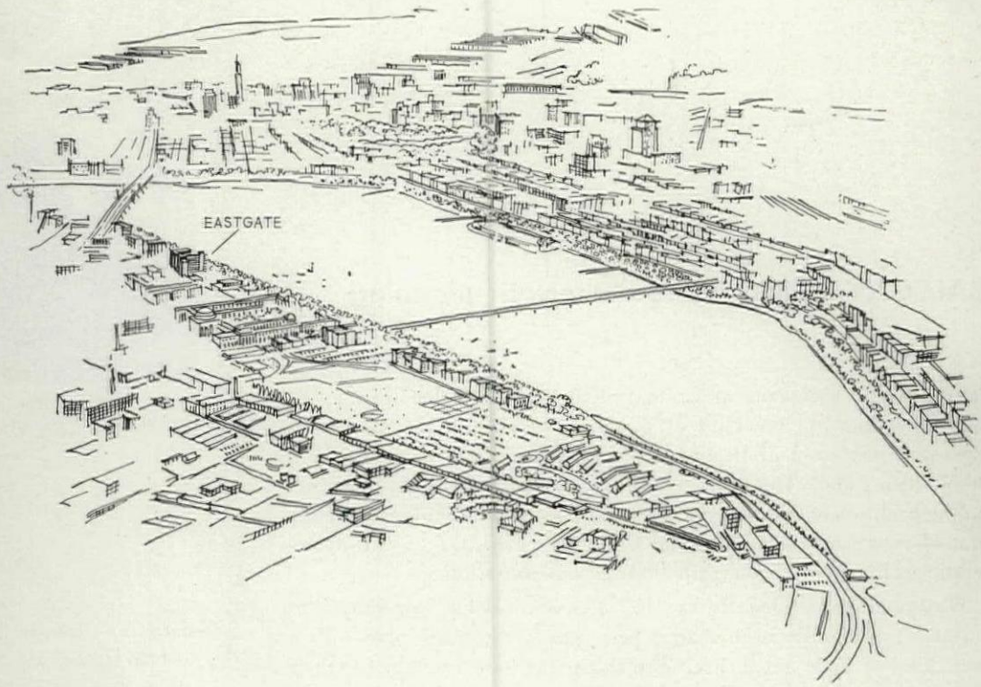
RELATIVE WEIGHT OF HORIZONTAL STEEL IN FIVE FRAMING DESIGNS FOR 200 LB. LOADING

Design			Beam type	Beam wt.	Girder type	Girder wt.	Total wt. per bay[5]	% saving over A[5]
A—Riveted[1]	Simple Span	20,000 psi	12WF36	720#	18WF64	1,344#	3,504#	. .
B—Riveted[1]	Simple Span	24,000 psi	12WF27	540#	18WF55	1,155#	2,775#	21%
C—Welded[2]	Continuous Span[4]	24,000 psi (neg.)	10WF25	500#	16WF50	1,050#	2,550#	27%
D—Welded[3]	Continuous Span[4]	20,000 psi (pos.) 24,000 psi (neg.)	12B19[5]	406#[5]	16WF40[5]	866#[5]	2,084#	40%
E—Welded[3]	Continuous Span[4]	24,000 psi	12B16½[6]	368#[6]	14WF34[7]	779#[7]	1,883#	46%[9]

[1] Connection details per figures 1 and 2, above.
[2] Connection details per figures 3 and 4, above, without plates.
[3] Connection details per figures 3 and 4, above.
[4] Alternate bay loading.
[5] Includes 4 plates: 2½″ x ¼″ x x3′-0″; 26#.
[6] Includes 4 plates: 3″ x 5/16″ x 3′-0″; 38#.
[7] Includes 4 plates: 5″ x 5/16″ x 3′-0″; 65#.
[8] Based on relative weight of 3 beams and 1 girder in each bay; includes plates in designs D & E, but excludes weight of connection materials: 164# per riveted bay; 74# per welded bay.
[9] 32% compared to design B.







BOSTON BUILDS BALCONIES

Eastgate has been open for ten months. The apartment house most keenly discussed by America's front-line architects and investors—the one on which the bright young men of MIT lavished their enthusiasm and ideas—the one with 240 balconies and 21 private yards opening off its 261 living rooms —has been in use long enough for a test of its ideas. It can now be told which of the bright innovations have worked out in fact as well as in theory, and which met unexpected difficulties.

LOCATION: Cambridge, Mass.

Architects-Engineers for Eastgate

Design Group

WILLIAM HOSKINS BROWN
CARL KOCH
ROBERT WOODS KENNEDY
VERNON De MARS
RALPH RAPSON

Engineers
THOMAS WORCESTER, INC.

Consultants

W. W. WURSTER
Dean of Architecture, MIT

A. O. WILLAUER
Arch. Consultant New England Mutual Life Insurance Co.

WILLIAM DAVIES
Archt., (Thomas Worcester, Inc.)

RICHARD J. OLDS
Management Consultant

CHARLES N. MARCH
Management Consultant

Owner
NEW ENGLAND MUTUAL LIFE INSURANCE CO.

Contractors
GEORGE A. FULLER CO.

▸ Do the tenants like this all-out experiment in balcony living? Indeed they do. There are many interesting reasons why the balconies at Eastgate have been adopted with an enthusiasm that makes the place look like Miami, and causes the bleak emptiness of many New York balcony apartments to look positively Bostonian by comparison. (Next page.)

▸ How does the skip-floor elevator service work? Okay—but very few builders would ever guess what the real advantage is (page 122), nor should any second-rate planning monkey with the idea, which makes every third floor a variant and creates all sorts of layout and mechanical problems. (Page 126.)

▸ How about the costs? $12,450 per apartment, $3,285 per room, as anticipated. (Fall of '48.) And while they were at it, Eastgate's sponsors and technicians showed how to set up a new program of long-range financing to offset today's building costs; demonstrated that an apartment house on the slab plan can compete with the cross plan; and invented a new form of construction agreement which is already spreading under the name of the "Eastgate contract." (Page 127.)

Photo: Ezra Stoller—Pictor

BALCONY LIVING—and democratic planning

The way the occupants of Eastgate live on their balconies may be Mediterranean but the kind of planning which brought its success sprang directly out of Boston, with perhaps a side excursion or two to Walden Pond. The combination was: a humanist ideal of living, in the tradition of Thoreau and Emerson; a sharp technology, directly out of New England's industrial brain center at MIT; and a democratic technique of leadership through collaboration.

Eastgate (known locally as "100 Memorial Drive," or simply as "100") is actually more than a new type of building plan—it's a new kind of open urban life. The occupants have brought out their favorite "porch" furniture—wood, wicker, iron, or bargain basement bent tubing—and have brought themselves out, too.

From any one of the balconies the surrounding panorama is a movie montage, laid confidingly open through the picture windows —the young mother caring for her baby, the housewife preparing her drapes, two young men sitting down to a balcony lunch. It would scarcely be possible to carry on such a town meeting in the open air, were it not for a high degree of consanguinity and mutual understanding.

And it is unlikely that an imitation of Eastgate would succeed unless it too sprang from such an impulse of democracy.

It all began with a level-headed and forward looking Yankee investor, George Willard Smith, then president of the New England Mutual Life Insurance Co. (now chairman of the board). On his 1938 vacation he looked admiringly at balcony streets in Amsterdam and Stockholm—and also at their sound economics.

The opportunity to do this job was found in 1947 by Smith's architect in charge of housing research, A. Osborne Willauer. In 1945 Massachusetts had passed legislation opening the apartment field to insurance company investment.

Smith and Willauer had decided that in this field safety lay in being "ahead of the procession." Only by delaying obsolescence could today's high construction costs be written off. Willauer found that MIT had a splendid site. Continued occupancy would be assured by proximity to so stable an institution.

MIT had yet more to offer—her concentrated resources of technical know-how, to put the project "ahead of current thinking."

A key idea was supplied by her humanist architectural dean, W. W. Wurster (predecessor of her present humanist Dean Belluschi). Said Wurster, "Let our young teachers supply progressive imagination. Then get experienced builders and engineers to check practicality." His nomination: the engineering and building firm headed by Thomas Worcester (its wise chief architect of that time being William Davies). To check costs and building methods, New England got Vice President David Appell of George A. Fuller—who incidentally invented a superior new form of working contract. To manage the project, New England's real estate officer Sydney Dean appointed a diplomat, Charles N. March.

How Smith figures his returns and how Appell set up his new kind of a contract is explained on page 127. They got off to a flying start. By year's end it was apparent that 100 Memorial Drive, still popularly known as Eastgate, would be financially a success.

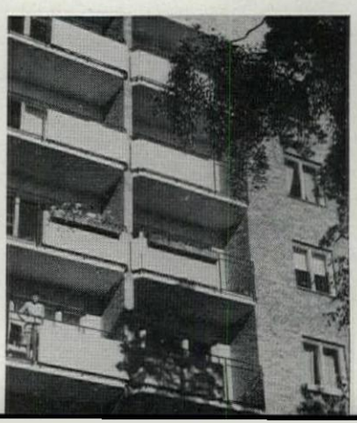




Eastgate's balcony idea was familiar to investor Smith from Amsterdam and Stockholm.



Eastgate's balconies are 14 to 16' long and 6' wide, protected by a 45" high open railing.

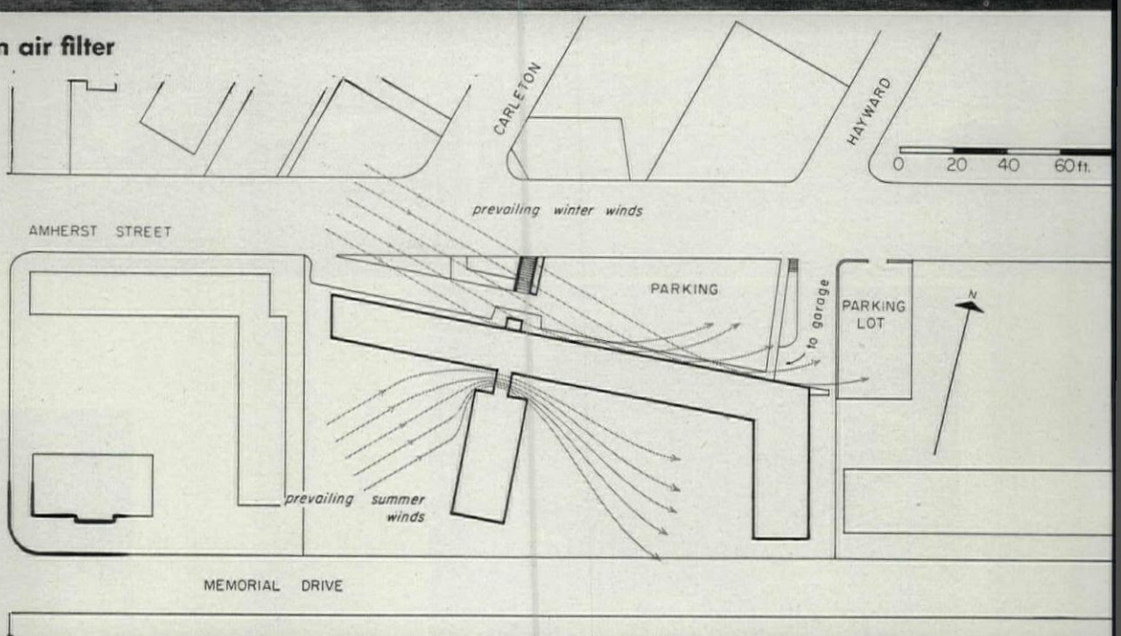


Photos: G. Kidder Smith, Harding Glidden, Inc., MIT Photo Service and Ezra Stoller-Pictor.

DISCOVERIES IN SITING: a river as an air filter

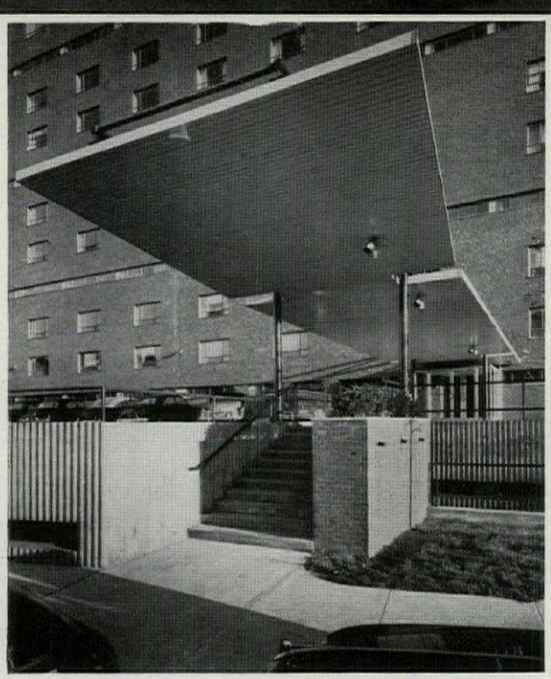
Anyone could see that there were wonderful advantages to a site on a river. But the designers, carefully surveying atmospheric conditions, fell on a fresh discovery: the prevailing summer breeze made a long oblique path across the water. The open space acted as an atmospheric filter. It cleared the air of smoke and soot, made the balconies habitable in the midst of a big city and on land directly next to an area of light industry.

In just three blocks along Cambridge's Memorial Drive along the Charles, Boston's humanist spirit has placed three powerful buildings: Aalto's "snake" dormitory (left foreground, below); Welles Bosworth's MIT, first modular university (marked by dome); and Eastgate, Boston's adventure in open democratic living (tallest building at top right).

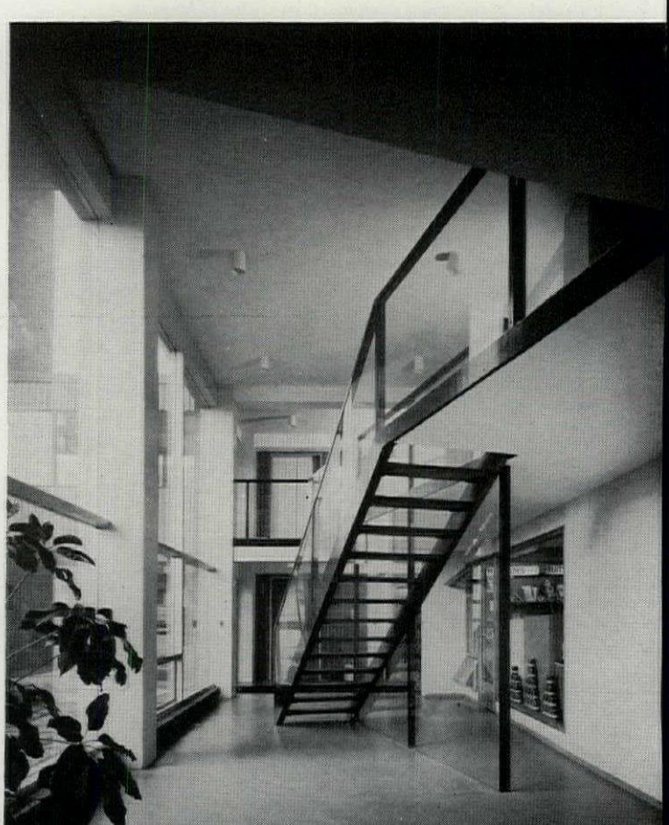




Photos (this and following pages): Ezra Stoller-Pictor



Entrance is on north side by ramps or steps under canopy. Lobby stairs take one down to garden level which can also be entered direct or from garage.



DISCOVERIES IN SITING—a good site fathers a good plan replacing the cross-plan

In buying land, sharp president Smith had always sought double value for his money through free, permanently open areas alongside to match the property he paid for. He had hit the jackpot when he found "100" not only behind Memorial Drive but along a river, and in a location favored by the breezes. Yet there was something further to delight his technologically-minded architects from MIT: the plot lay broadside to *both* the view and the sun.

This situation provided the perfect excuse to experiment with something else than the ubiquitous cross-plan, which investors love for its economy and which architects hate because one-fourth of its apartments never get adequate sun, because a great many are blocked off from cooling breezes, and because *none* has through-ventilation.

At "100" the young architects were able to set up a cardinal principle of planning, a program for better living—*every apartment was to face south, east, or west, for sun and view.* This permitted—

1. A balcony (or private yard) off every living room

2. Direct sunlight during a large share of the day for every living room, dining space, and kitchen

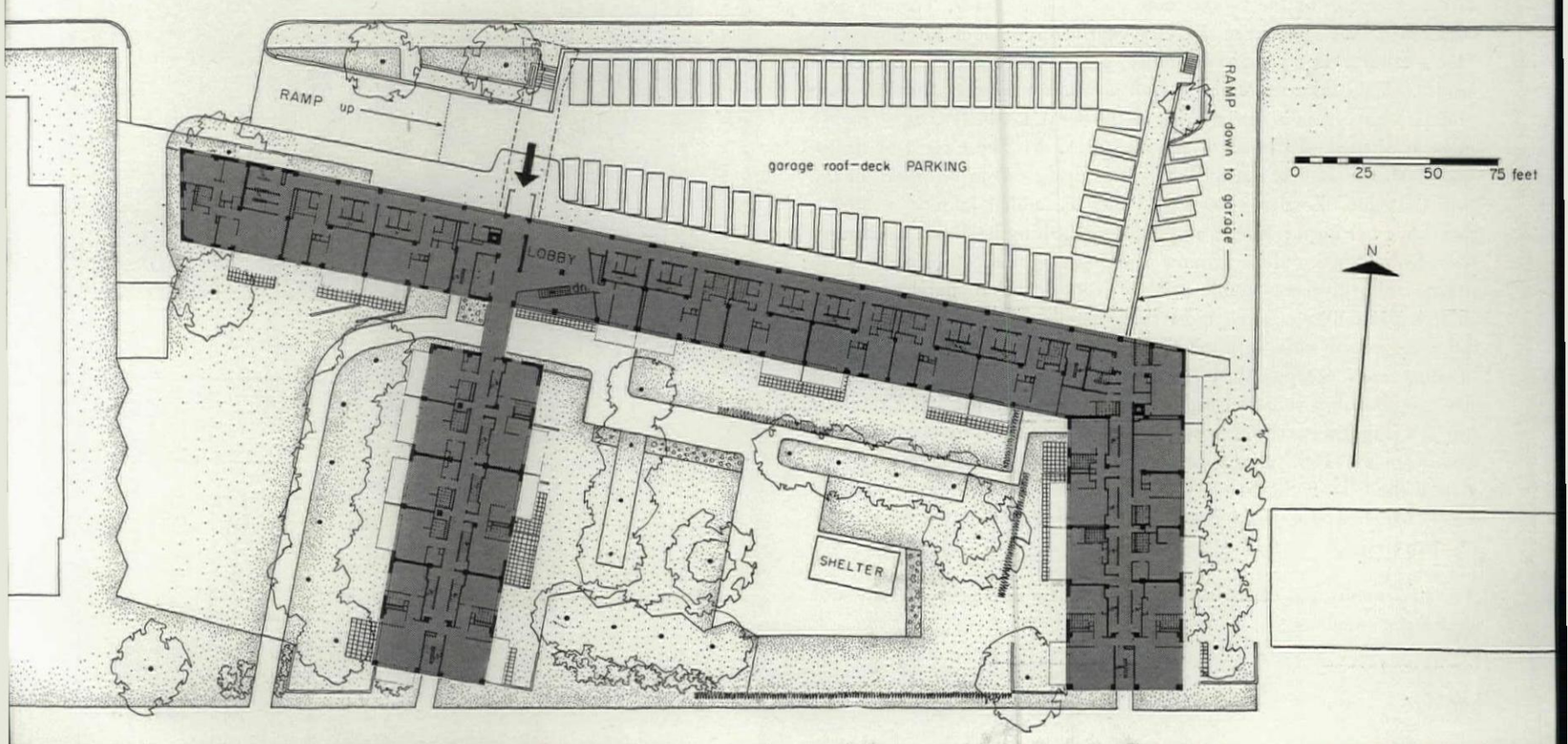
3. Through-ventilation for a large proportion of apartments

4. Privacy and spaciousness through avoidance of tight "re-entrant angles" where living rooms look into one another.

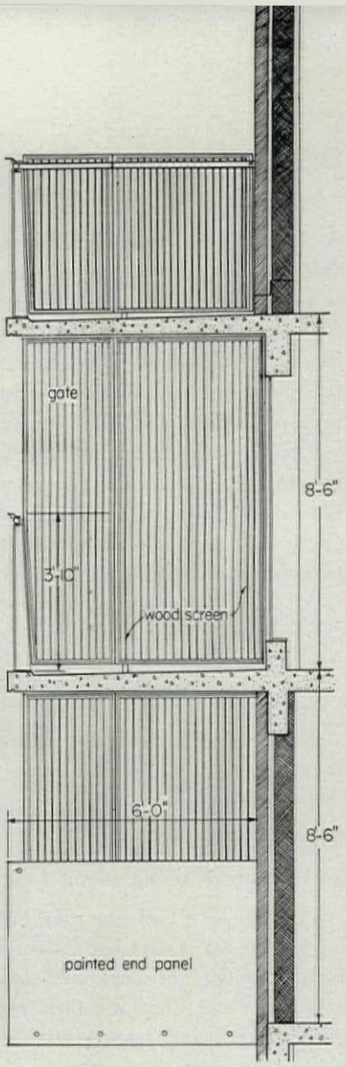
They hit on a building plan in the shape of an open F (shown below). The main stem had its corridors to the north, living rooms all facing south; the legs had central corridors and living rooms east and west. Checking their results against a comparable X-plan built at the same time, Eastgate's architects were able to show a net-to-gross rental area ratio of 55% compared to 50%, at no higher construction cost per room.

INCIDENTAL SITE FACTORS. Foundation conditions on made soil were bad, required pile foundations (cost $186,787)—this was thought to be offset by the premium location. Local stores and schools were at a distance, but most tenants had cars. In fact the program underestimated the need for parking (page 126). A subway station was within one block and ten minutes of downtown Boston. A zoning limitation on height led the architects to squeeze 12 floors into 102′ at a floor-to-floor allowance of only 8′-6″.





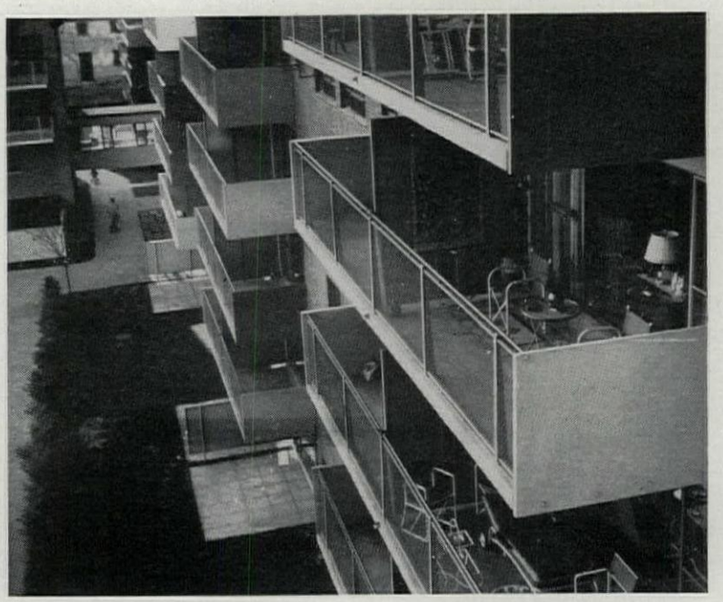


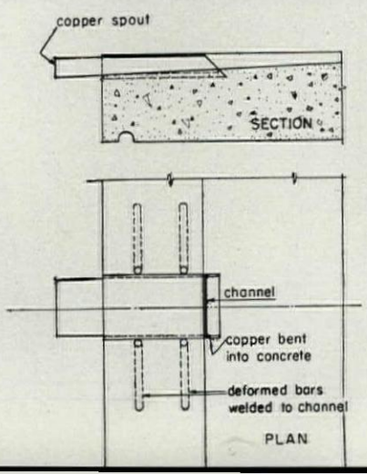


TRICKS OF BALCONY DESIGN

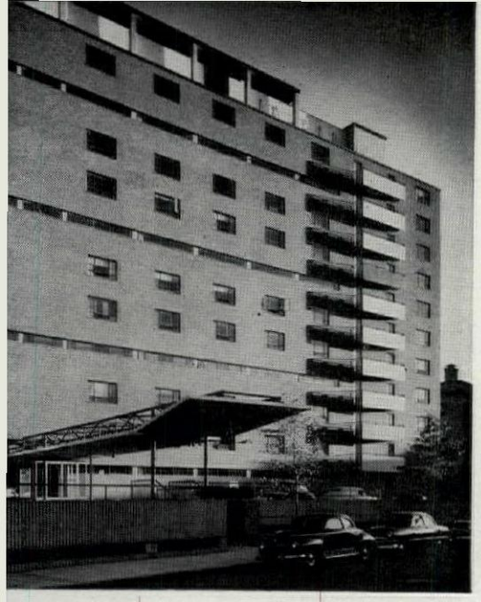
The fact that MIT's young architects actually got the occupants "out on the porch" was no lucky accident. There is many a tricky hurdle to balcony planning. 1) For full effect, every balcony must be a direct extension of the living room *and its floor level.* For physical continuity balconies were directly cantilevered from the floor slab (see section). For visual continuity, glass was brought down within only 9″ of the floor (though this left no room for convectors, no good place for any pipes in the exterior wall—see p. 126). 2) Every balcony must be shaded, sheltered (slabs over all). 3) There must be drainage, flashing. It was finally decided to drain out to scuppers in the forward edge. Leader pipes could then be added later if needed—they have not been needed; and balcony flashing has been amazingly trouble-free, better than window openings. 4) Balconies must be so placed as to give reasonable privacy from next-door neighbors. Yet in this particular scheme most balconies had to be paired, so the neighbor could walk through the dividing door for a second mode of emergency escape (through the next-door apartment) in case of fire. 5) Railings must be high enough for safety (45″ at Eastgate) but it's important that they not cut off the view. For economy, the architects of "100" used wire netting. Fuller Construction Co. reported the cost of the balcony construction (not including doors) at $374, which would put a rental value of $10 per month on the joy of open living.*

* And it's worth much of that to the tenants to have such an easy way to wash their picture windows.







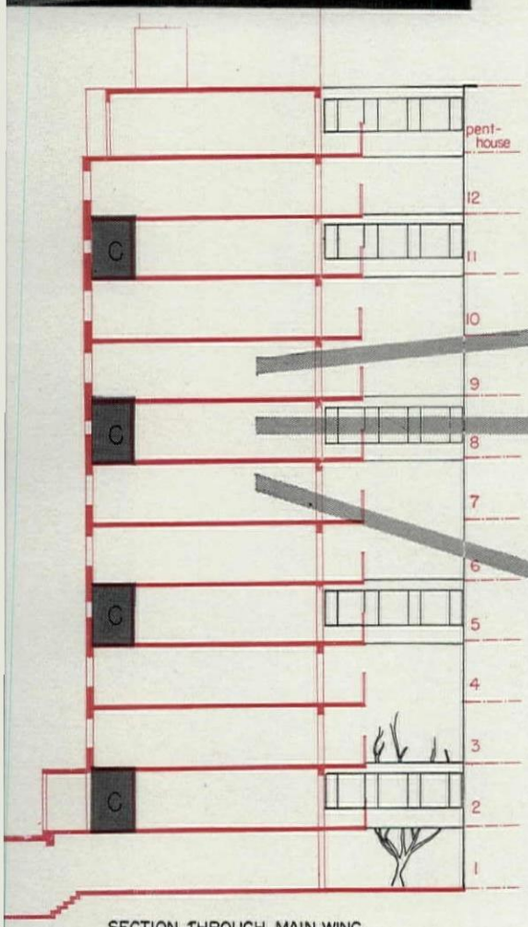


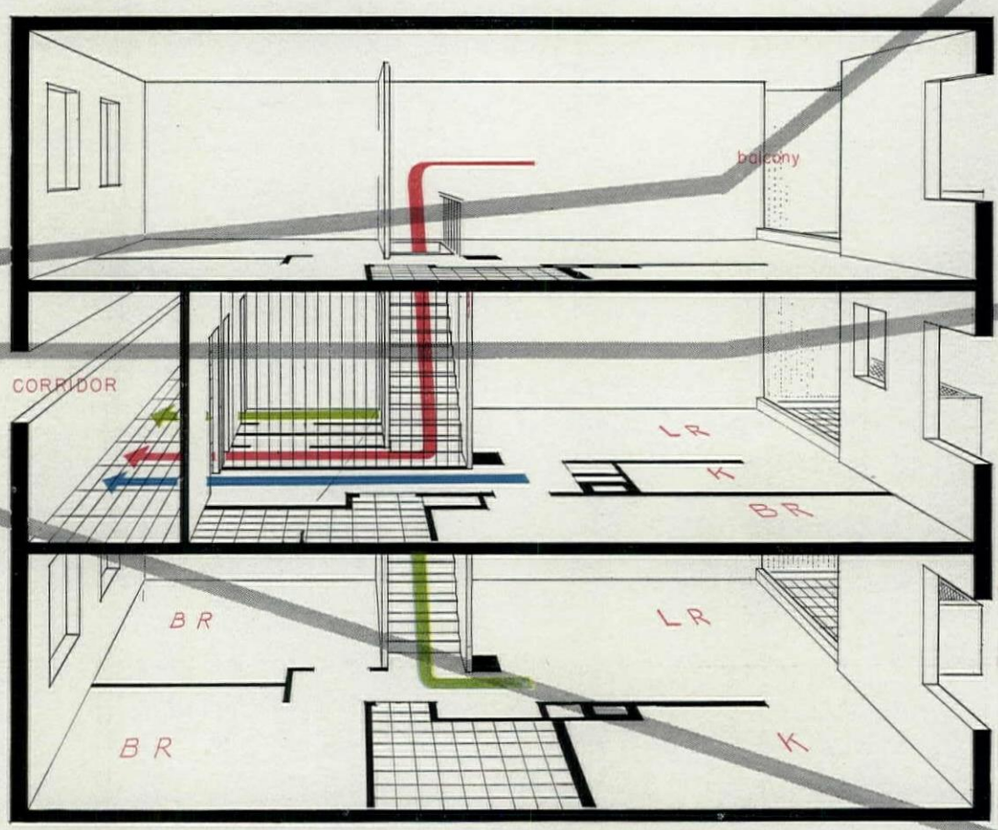
SKIP-FLOOR ELEVATORS: why and how

Surprisingly enough, the skip-floor elevator system at Eastgate was introduced *not* primarily for economy in operation but *because only a skip-floor elevator scheme would permit the introduction of a corridor along the north side of the main stem, so every apartment could have the desired south orientation.* (With side corridors on *every* floor there would have been altogether too much public space, altogether too many smaller apartments.)

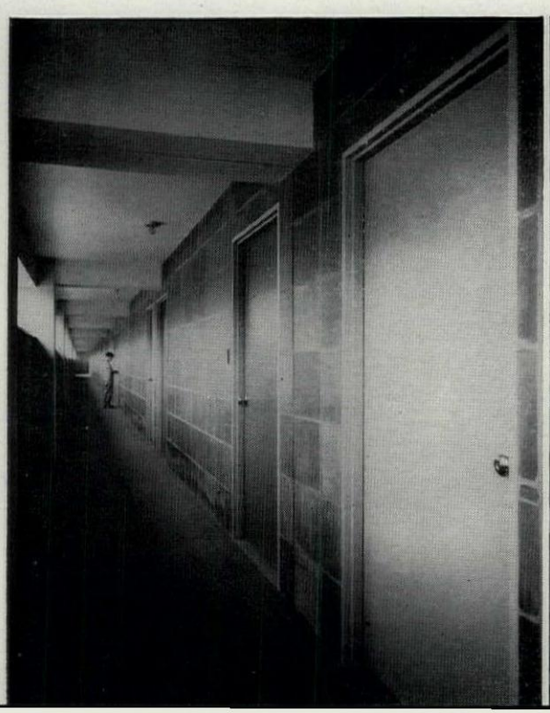
Moreover, the skip-floor scheme allowed apartments on two of three floors to have two exterior exposures and through ventilation.

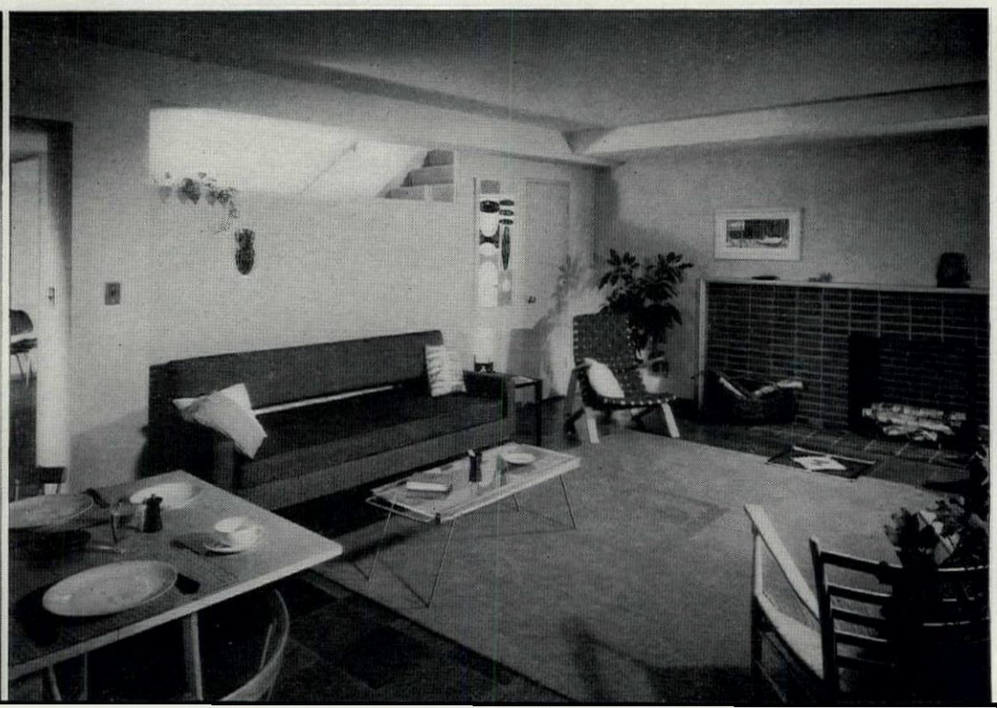
In use, the scheme works as follows: 1. Every tenant gets off at the nearest corridor floor (see vertical section, left below). 2. On this floor are doors to all apartments. 3. Dwellers on non-corridor floors find a vestibule (with closet) and a private stair up or down. (Drawing right below.) 4. In case a fire blocks his private stair, the occupant goes out on the balcony, through to his neighbor's apartment, and thence down to the public corridor.



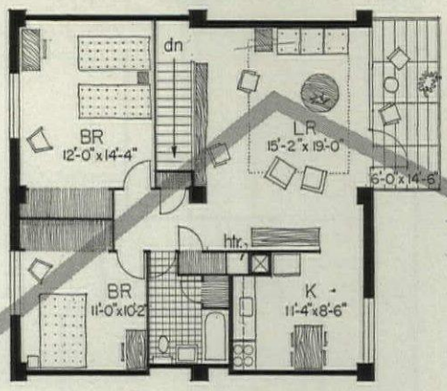


SECTION THROUGH MAIN WING

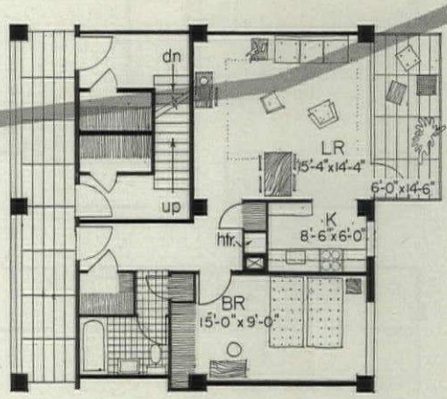




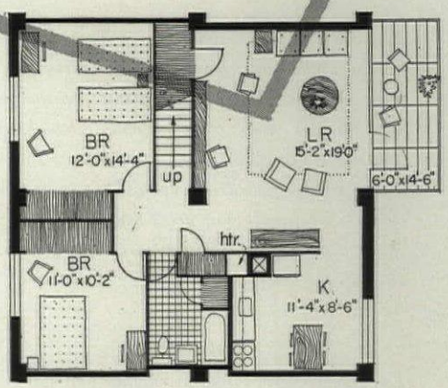
These are main-stem apartments



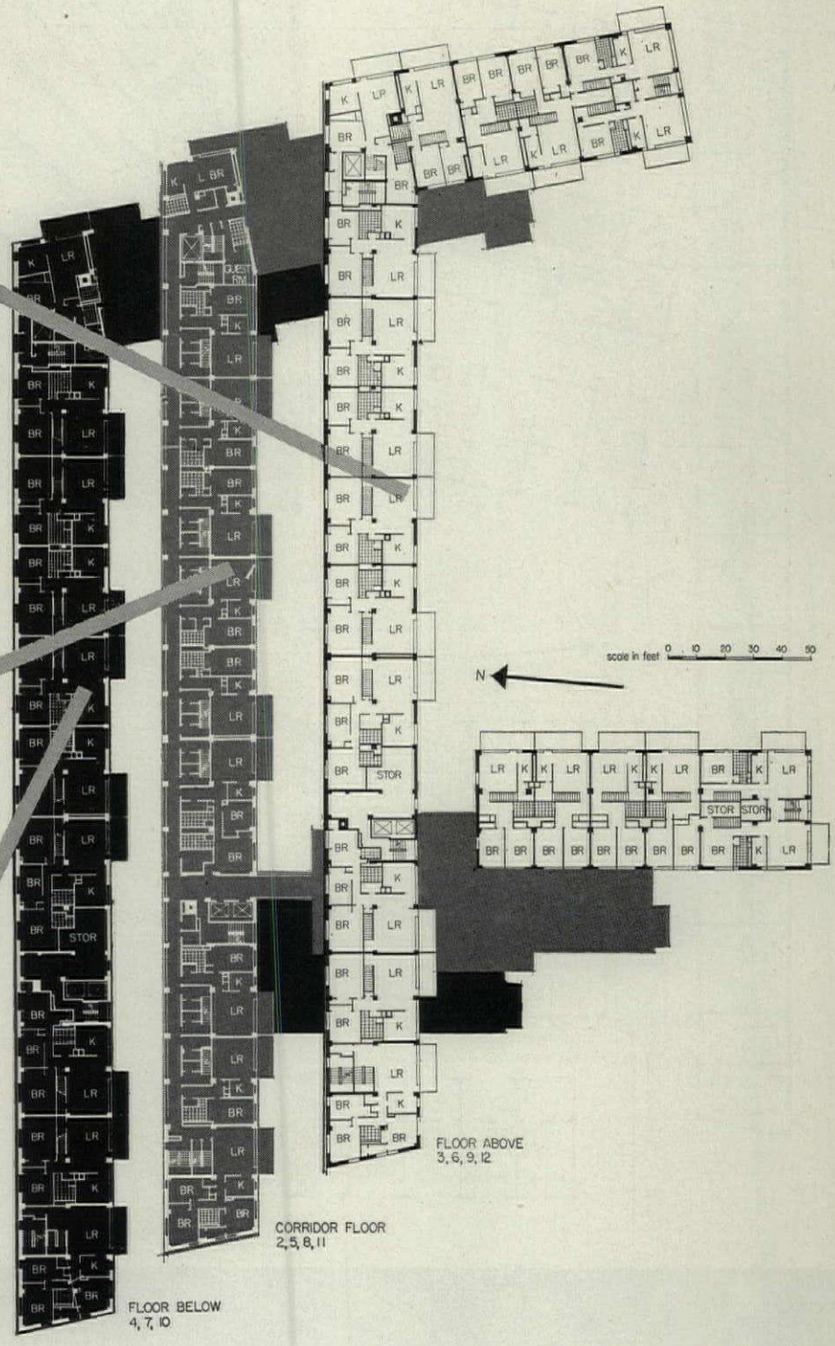
This upper-floor apartment is an "A" unit (A for "above," and a blue door on the corridor suggesting "sky"). The stair landing location is slightly inconvenient.



This typical "C" unit (C for corridor, a yellow door) is a one-bedroom unit, yet it has better than the minimum of 24 sq. ft. storage space.



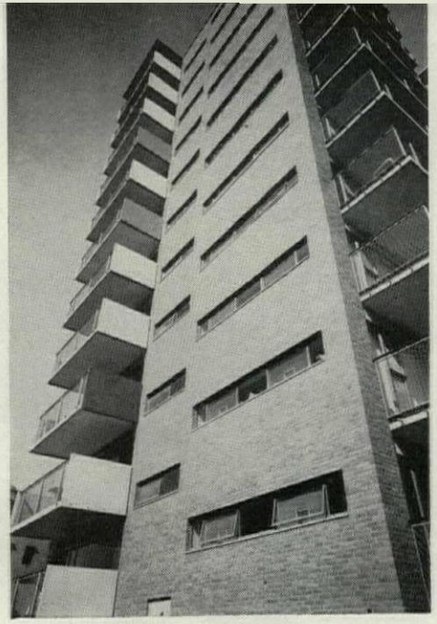
This "B" unit (B for "below" and a green door suggesting "grass") has a better stair landing than the "A's" but is otherwise the same.

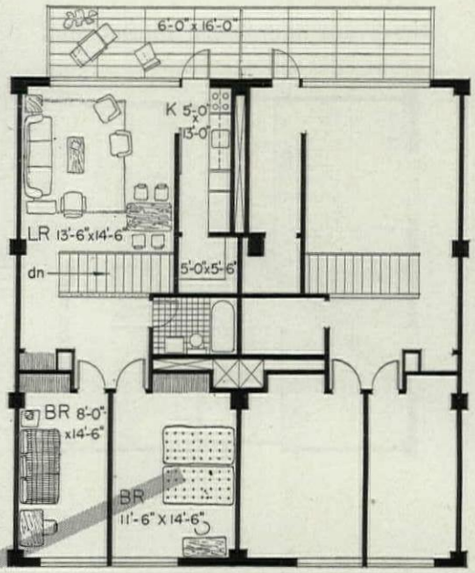


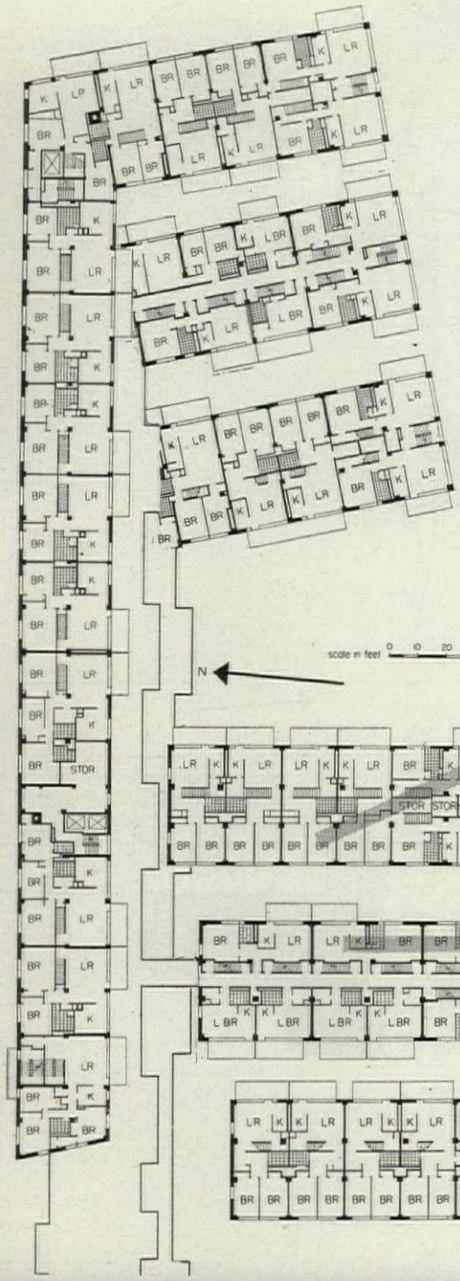
Private vs. public access stairs; side vs. central corridor

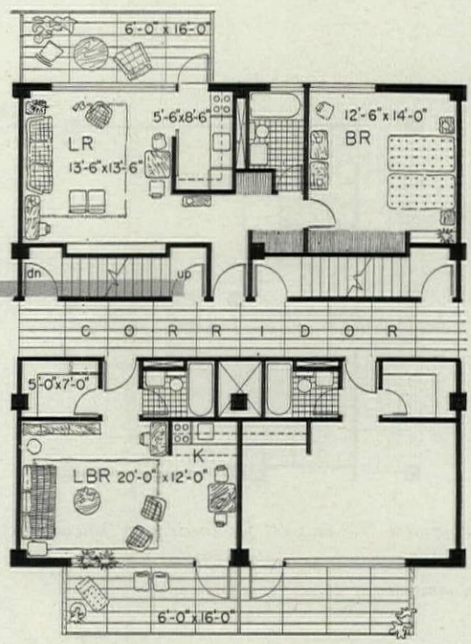
Should access stairs in skip-floor schemes be private and individual or public? Boston's are private; those of St. Louis (shown last month) are public. At Boston's "100," the owner had to build more stairs (there are 165 at $168 apiece), but he had *none to maintain*, and tenants have shown no displeasure at doing this. Stairs consumed more total building space (fire-stairs were required under Cambridge code at building extremities) but the owner had only half as much public area to care for: and where private stairs were left open they contributed air space to the apartments. (Photo across-page shows the alternate arrangement with a closed stairwell which yields more wall surface against which to place furniture.)

Since every living room, under the Eastgate program, was to face toward sun and view, there were side corridors in the main wing, central corridors in the legs. Unit plans on this page show one- and two-room apartments on the main stem.











These are "wing" apartments

Because of the proximity to MIT, a good many studio apartments were thought advisable, and they were tucked into the wing apartments on the corridor floors (see directly above). They are especially nice, open broadside to the view. Opposite are 1-bedroom units; on non-corridor floors above and below are 2-bedroom units. End-units have corner living rooms, draw rentals up to $175 per mo.

Eastgate's current rental schedule:

1	*penthouse apt. 8 rms.*	
28	*studio apts. totaling 56 rms.*	*$65- 90*
95	*1-br. apts. totaling 285 rms.*	*$125-165*
108	*2-br. apts. totaling 432 rms.*	*$130-190*
29	*3-br. apts totaling 145 rms.*	*$175-225*



A test of UNIFIED STANDARDS in a variety of arrangements

Eastgate exhibits a variety of apartment types arising out of the skip-floor plan plus the two kinds of orientation plus the changes from central to side corridor. All had common features:

Broadside exposure: All living rooms were given their long dimension along the exterior glass wall, yielding pleasant light, full outside view, and a sense of the balcony as an extension of the room. Sitting areas were planned carefully away from traffic areas.

Kitchen and dining space along outside walls. This started with a Cambridge code requirement that kitchens receive natural ventilation. Yet the architects never sought a "variance" because they thought the working housewife *should* be able to enjoy the view. Compared to this the lack of direct hall access to the kitchen was of trifling importance. So they placed the kitchen doors in such a way that dining might be sunny too, not in some dark inner hall space.

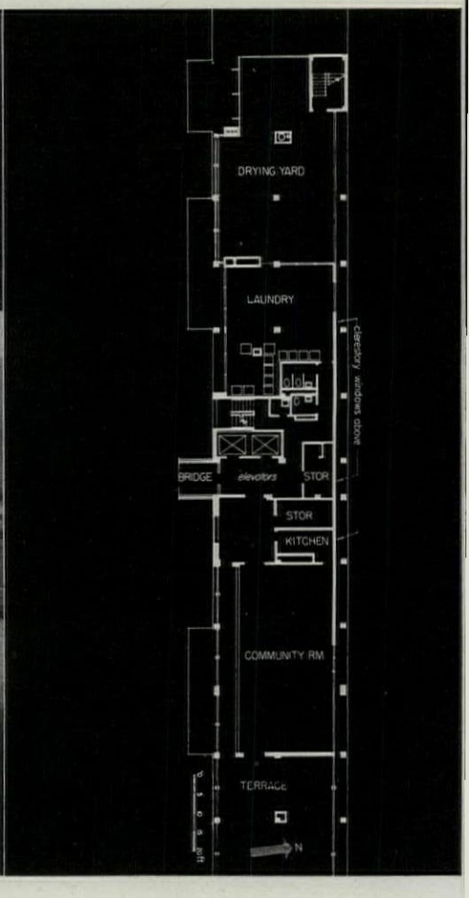
Bedrooms were generally ample in size, so planned that beds need not face windows or block access to wardrobes.

Storage was treated as a special problem; a minimum of 24 sq. ft. storage was found in all but 10% of small apartments (for which outside locker space was added).

By now manager Charles March has been able to weigh public response. His last units rented were some in the elbow next door to the National Research Corporation, which suddenly and unexpectedly went on a 24-hr. schedule. (Collaborative measures are being undertaken to screen the light and dampen the sound.)

Some things were proved: The public liked the balconies. Against the predictions of real estate men, the public did not object to inside stairs. Turnover, thus far, was virtually nil.

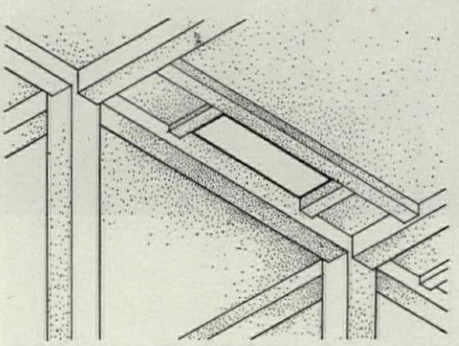


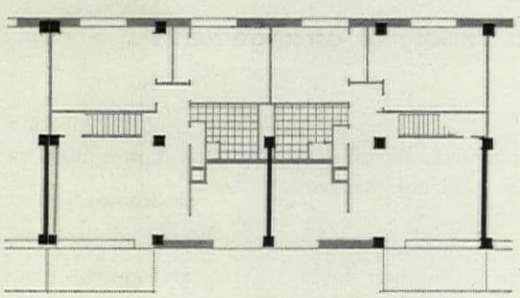


TECHNICAL PROBLEMS arise from a new plan type

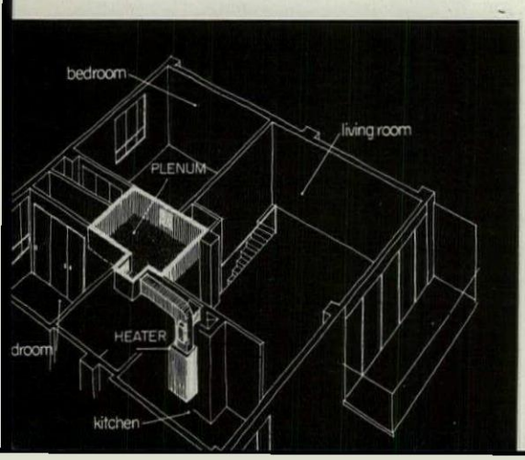
Heating: Had it been possible to build Eastgate 3′ higher, Engineer Turner could have installed a radiant heating plant; but it would have added 3″ to every slab. The "metro" type was out too: no good place in all those glass walls for heating risers. Instead, Turner brought up his steam through interior chases to individual coils for each apartment, where air was fan-fed to all rooms through ducts in the ceiling, locally furred (see sketch). The individual tenant had the pleasure of setting his own thermostat; but the canny owner controls the pressure of the steam. Heating cost has been well within the budget (6 mos. for $15,000). But because the glass (especially in north bedrooms) has not been directly heated and is subject to condensation, New England has paid $6,000 for storm sash for bedroom windows. And the window design has compelled their installation toward the interior.

Structural: For a tall thin building, Tom Worcester's conservative structural engineers designed wind-bracing in the form of diaphram walls (serving as partitions). Because balconies were vertically aligned, columns in exterior walls were thickened toward the bottom in depth only, kept uniformly wide. To avoid excessive thickening and projection into the room, concrete of 4,000 lb. strength and hard reinforcing steel were used below the 9th floor.

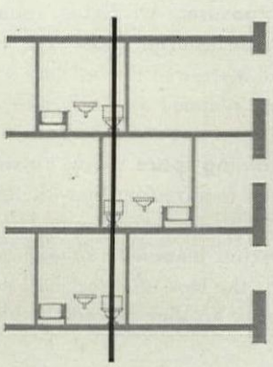




Floor slabs were designed for plasterless self-finish and with a minimum of breaks. Yet flat-slab design was out because of the many framed openings; hence a longitudinal center beam was used with crossbeams to help frame the stair wells (drawings).



The differences in plan between corridor and non-corridor floors created an alignment problem in all *stacks*. (Note generous chases in building plan.) The vertical section (right) shows careful planning for alignment. Many tubs had to be raised up to allow traps to clear bedroom ceilings. Tenants asked: why not such raised tubs *always?*—easier to use and clean!



PUBLIC SERVICES are numerous

Because "100" is in effect an island, president Smith early decided that it should offer certain public services: notably parking, a small store, a self-service laundry, and a community room.

The parking problem has given "Oz" Willauer headaches. Provision was made for 160 cars: 65 in the garage, 65 on its deck. Said the voice of experience: a new apartment building requires parking for at least 100% of its tenants. So now he has arranged 30 additional stations on contiguous parking lots.

The small store is doing all right. It sells tenants their little daily necessities of food, drugs, variety goods to save shopping trips. There is some thought of adding a tea room.

The laundry was put in a wonderful place as part of the penthouse on the roof. Its noise was a little rough on the folks below until fiber glass and cork pads were put under the machines.

A community room on the penthouse, opposite the laundry, is just being furnished now, to be rented to occupants for special occasions. It is to be fully equipped: kitchen, radio, television.

CONSTRUCTION CONTRACT—a new invention

To reassure Smith and Willauer during a period of rising costs, David Appell of George A. Fuller Co. worked out a new form of contract—which has proved so popular that it is now known as an "Eastgate" contract and is being used by institutions such as Harvard, Wellesley, and the Federal Reserve Bank of Boston on new work.

Briefly, it goes like this: Fuller as the contractor submits a guaranteed cost. It is based on three things: 1) estimated cost based on current but usually unfinished drawings; 2) a percentage fee for the contractor but with an upset limit; 3) a contingency fund controlled by the owner to cover new labor costs, freight rates, materials increases, government regulations and the like. This too has an "upset" on it so as not to exceed a known amount.

Under this contract the contractor has no need to load his estimates for wage increases, changes in complete drawings, etc.; but if he builds for *less*, the owner receives 75% of the savings. At Eastgate it worked out like this: There were 98 change orders, adding $300,000, each item negotiated. Nevertheless the final cost was *below* the initial guaranteed cost, including contingencies, by $369,000. So in the end Fuller presented a happy client with a $276,000 check.

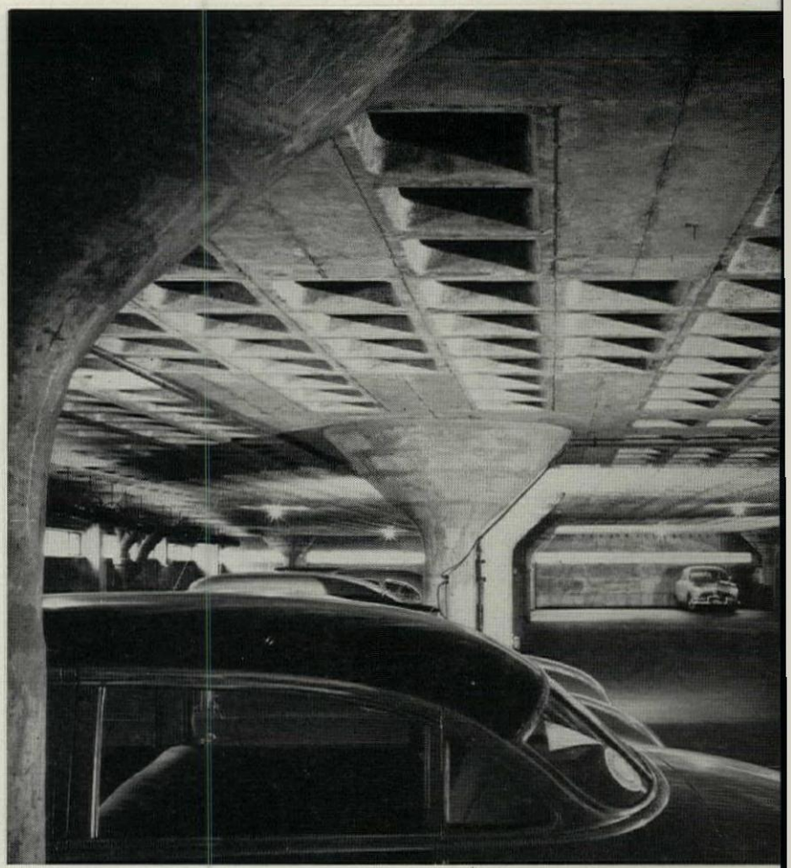
FINANCIAL POLICY—checking a new one

As tenants came pouring in, manager March began drawing up trial balances, liked what he saw. By the time Eastgate completes its first year of operation, it will be almost certainly 100% occupied. And chairman Smith found confirmation for his initial reasoning. It went like this: today's construction costs are high—"too high." By finding a very superior location, by building technically "in advance of current thinking," he could earn a high initial return to fortify himself against later competition.

Even allowing 7% vacancies Eastgate anticipates that its initial $40-a-room rent schedule will bring in $568,000 a year. After ground rent, taxes, and operating expenses budgeted to total $208,000 a year, that will leave $260,000 net, or about 6.9% on a $3,750,000 investment.

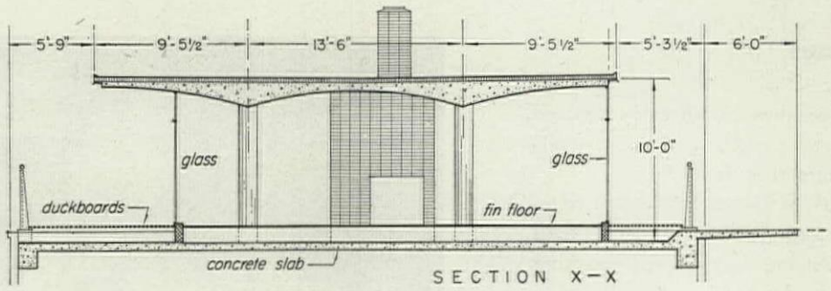
Instead of writing the building down at the more usual rate of 2% a year and taking 5% profit at the outset, New England Mutual plans to take a much lower immediate profit (presumably around 3%) and to write off nearly 4% a year.

By 1960 this will permit lowering the rents to around $25 a room if necessary to meet competition.



COST BREAKDOWN

Foundations	$170,000
Structure (including insulation and wall coverings)	2,137,000
Roof and sheet metal work	24,000
Windows	80,000
Steel stairs and elevators	87,000
Finish floorings	82,500
Furnishing (kitchen cabinets, sinks, ranges, refrigerators, etc.)	120,000
Trim and doors (including overhead garage doors)	67,000
Hardware	18,000
Painting	56,000
Electrical installation	175,000
Plumbing	225,000
Heating	175,000
Special equipment	39,500
Construction Cost	$3,456,000
Cost of apartment house	$3,284,000
Cost of connecting garage	172,000
	$3,456,000



SECTION X–X

A leading citizen gets a penthouse apartment . . .

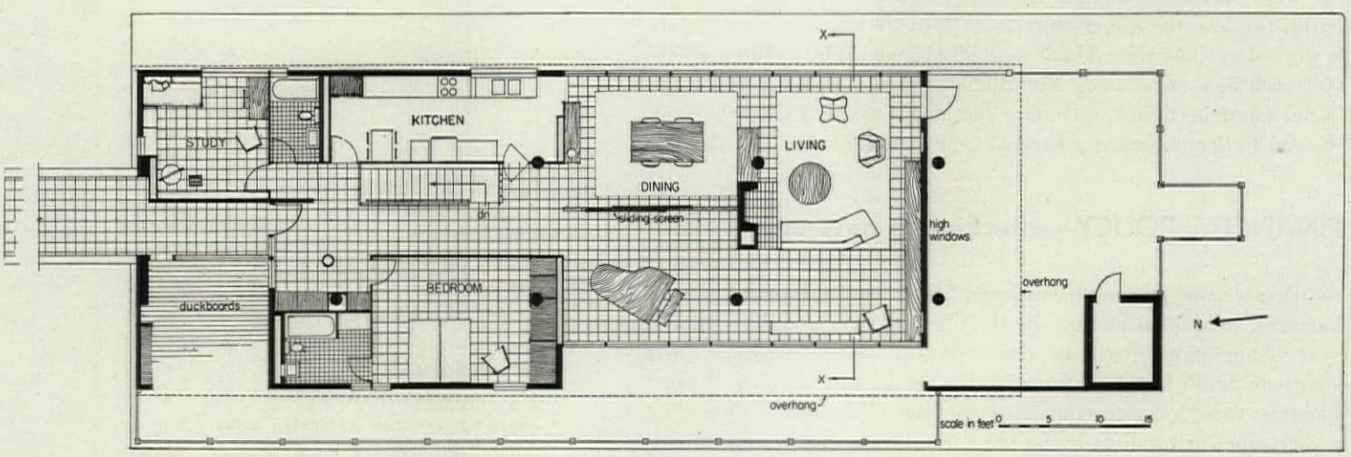
. . . and architectural criticism looks at "Eastgate"

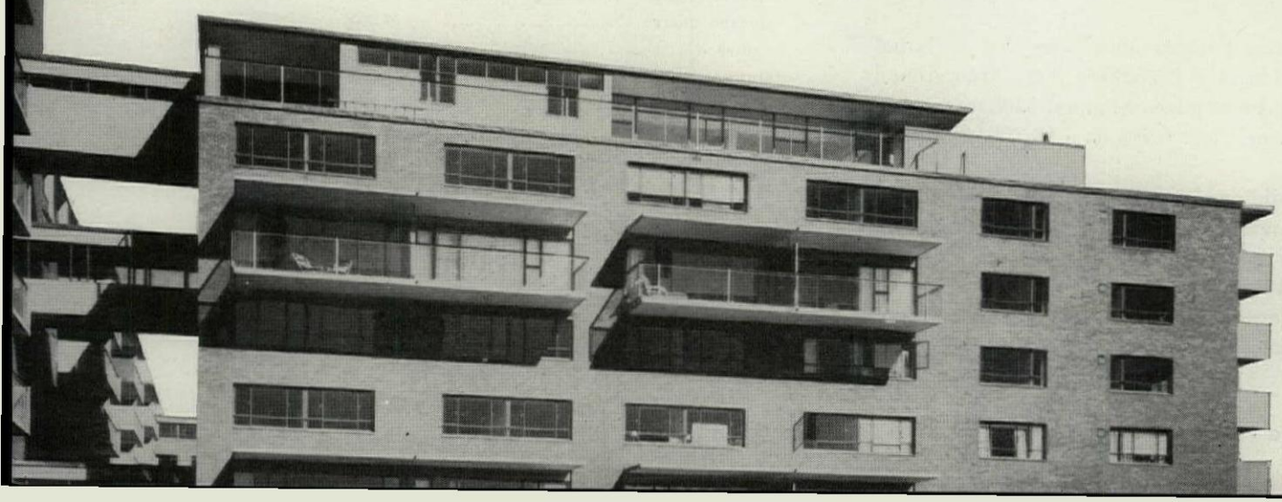
Penthouse apartment has cantilevered vaulted ceiling. Pipes and ducts are carried between slab and raised floor.

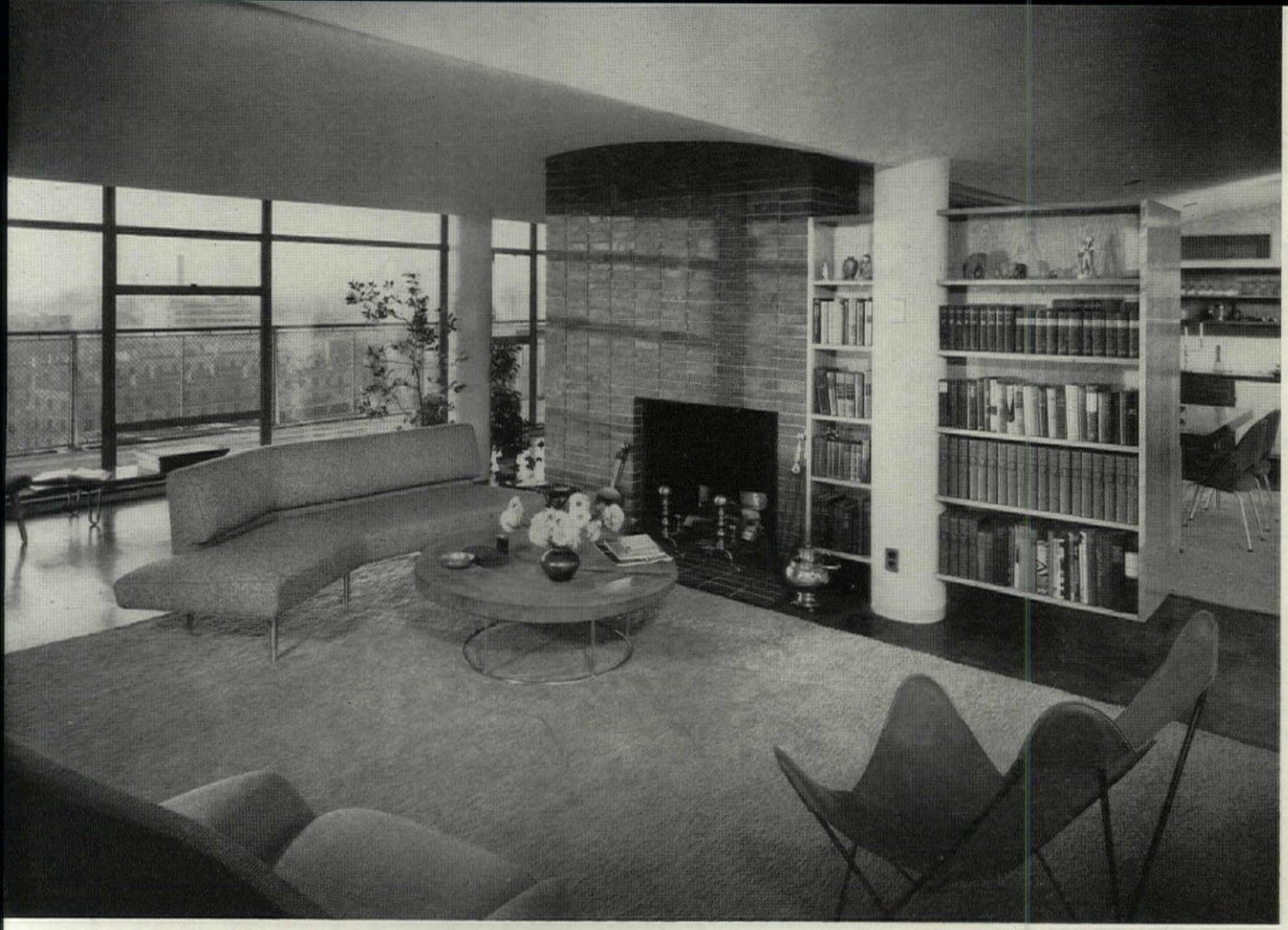
Prize apartment of all went to MIT Corporation Chairman Karl Compton. Here the designers were free to play with a vaulted ceiling, produced a dwelling that Dr. and Mrs. Compton love, especially as a conservatory for flowers. They *don't* care too much for the excess heat produced by the east and west glass walls of their "conservatory," have asked the architects to struggle reconciling their handsome architectural knife-edge fascia with movable awnings.

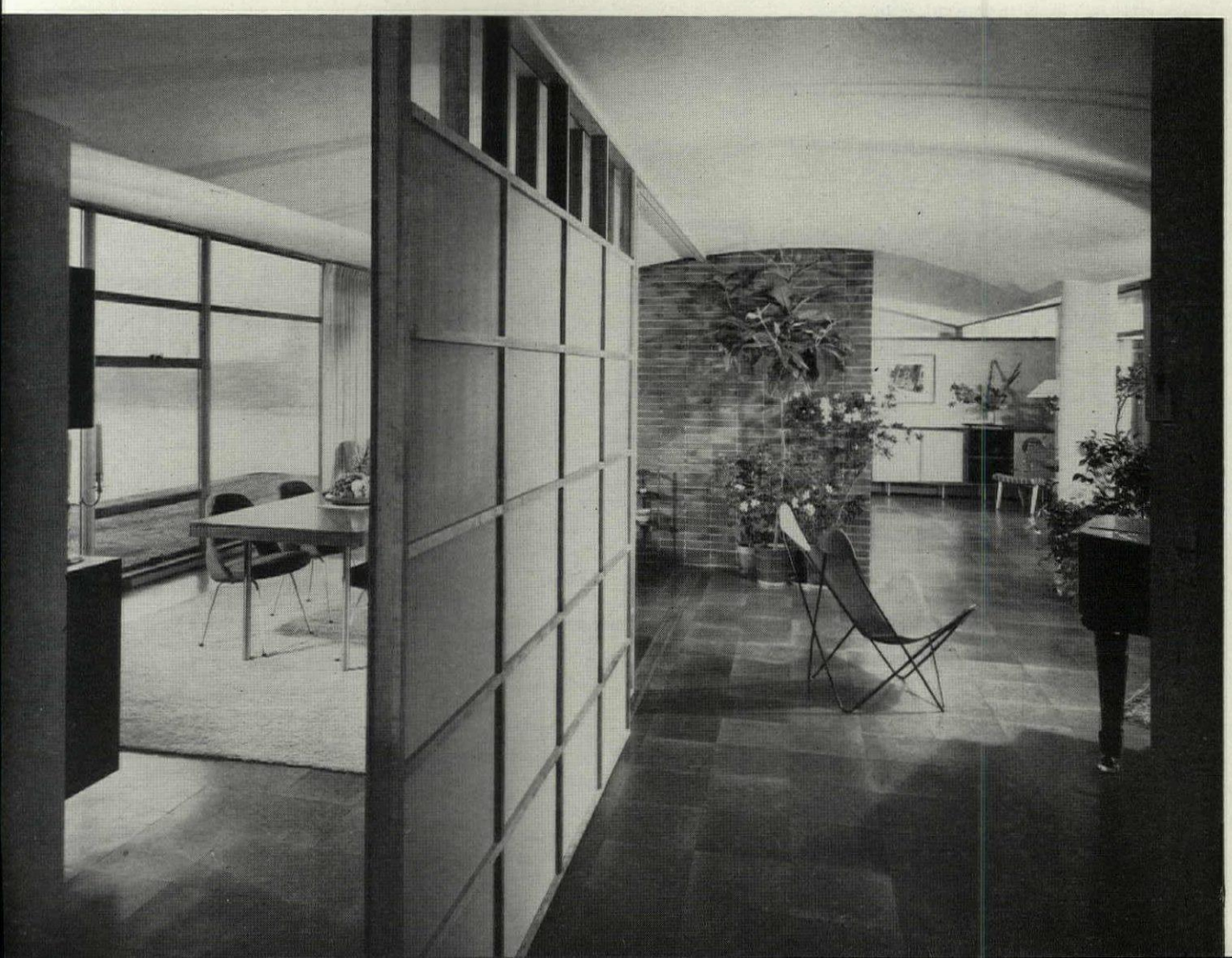
So architectural criticism can now stand back, size up Eastgate. Head and shoulders above the usual U. S. apartment, it shines by its thoughtfulness, its splendid living concept, its care in detailing. Schematically less simply standardized than some, it provides a more workable and livable *variety* in its living arrangements. Fault might be found with a certain thinness of Puritanism—too much insistence on that one theme of repeated dashed horizontal lines; how one would love one good big juicy curve! Yet gaiety has taken root in the bright flag-like balcony ends; a new freedom, rid of the sterile nostalgia momentarily plaguing downtown Boston, has begun to blossom.











WHAT PRICE MORE SPACE IN THE BUILDER HOUSE?

Case studies show 10% to 15% increases in area cost little, but pay big dividends in livability

What sense does it make to surround the costly utility core of today's house with a bare minimum of living space?

"No sense at all," says famed designer Charles Eames (THE MAGAZINE OF BUILDING, Sept. '50). "Most builders think that when they've finished paying for kitchens and bathrooms there isn't enough money left to make houses big enough for comfortable living. Actually, space is the cheapest luxury a house can have." Here is some solid backing for Eames' point:

1. HHFA has performed a real public service by providing specific cost data showing how a 14% increase over HHFA minimum room sizes could add as little as 3% to the total cost of the house.

2. Fabulous builder Bill Levitt's office estimates that his standard $9,000 house could be lengthened one stud space at each end for only $200, adding 8% to the area of both main floor and finished expansion attic at an increase of just over 2% in the selling price.

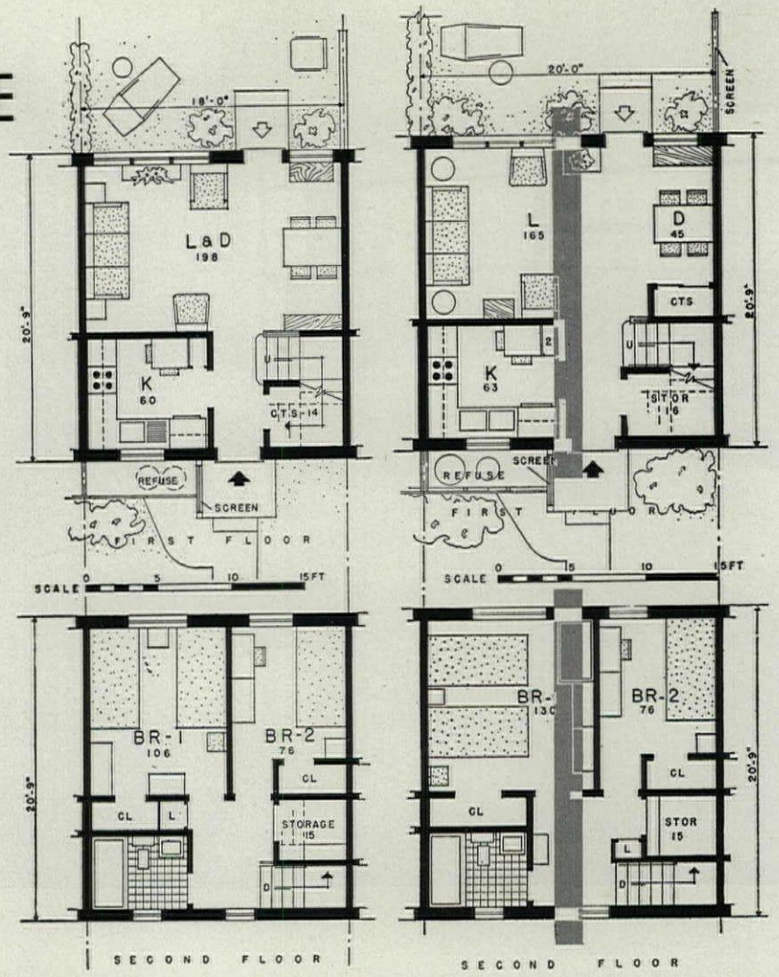
3. Washington builder Robert C. Davenport finds that he can expand his 1,000 sq. ft. house 20% for less than half the original sq. ft. cost, that 80% of his buyers will pay up to $1,100 for space additions.

"The time has come," says HHFA, "to start concentrating on methods by which room and storage areas may be increased while holding the line on costs. . . . There is much evidence that the practice of decreasing dwelling sizes merely to reduce costs has been carried too far. This not only imposes an immediate hardship on the family but in the long run, the financial stability of the investment is threatened."

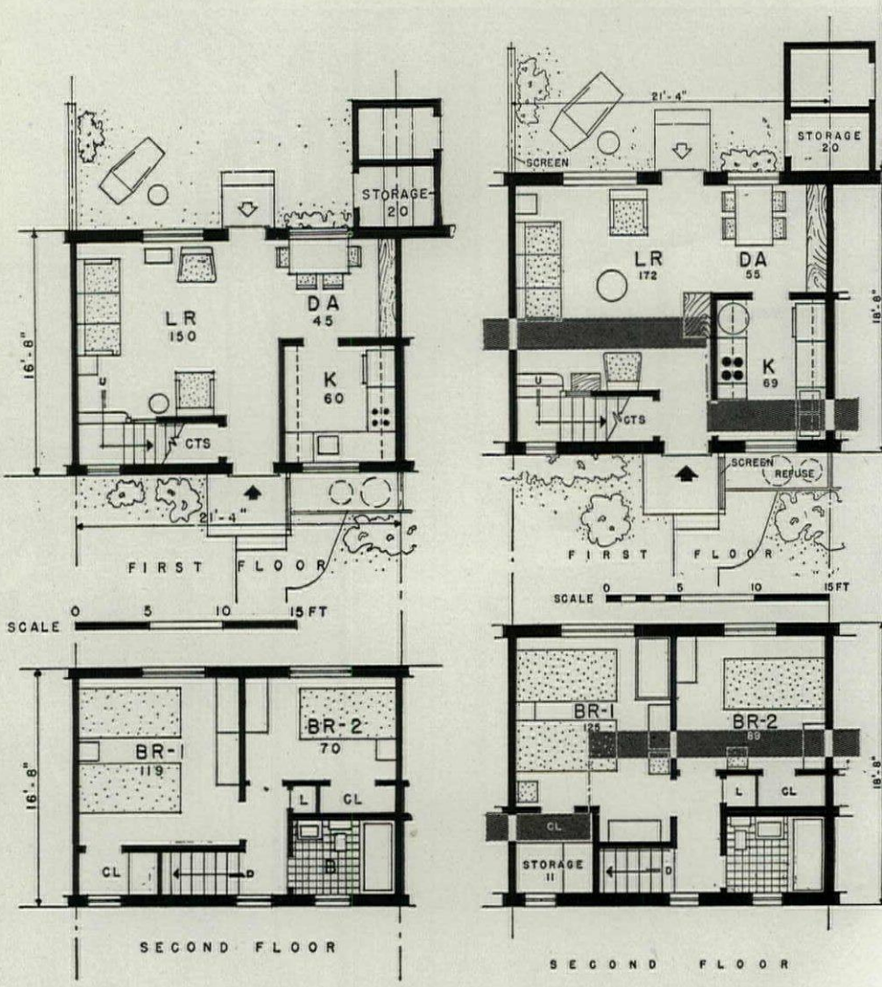
To document how inexpensively slightly larger rooms can increase livability, HHFA got Washington, D. C., prices for adding 2 ft. to the depth or width of typical rectangular brick-veneer row houses whose original plans were based on minimum HHFA room sizes (examples, right).

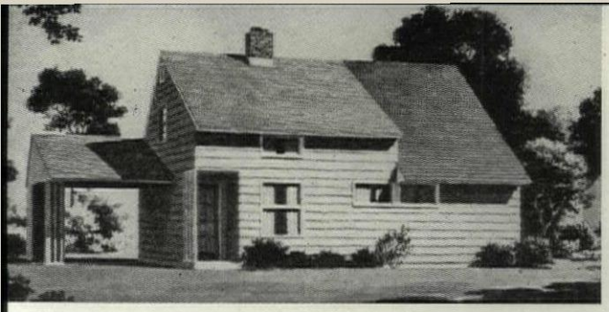
Adding to the depth cost only $3 per sq. ft.; adding to the width, between $4.50 and $5. On the various schemes the houses were made from 10.6% to 13.9% bigger at an increased cost of only 3.0 to 4.6%. Since stairs and baths remained unchanged, the increase in room sizes was always greater than the increase in total size—some rooms gained as much as 25% more space. Obvious reason why the increased size cost so little is that the 2 ft. increments required no changes in bath, kitchen, plumbing, heating and wiring which took 25% of the smaller house cost. HHFA figures the added costs could be absorbed by rental increases of only 2 to 3%.

Constructive as the HHFA study is, it ducks an obvious question: If HHFA thinks it is high time room sizes were increased and if HHFA can document the fact that the increase could be achieved at little cost and great profit, then why doesn't HHFA increase its room size minima so that they are at least as high as those for public housing?



In HHFA example (below) adding 2' to depth added 11.6% to overall area, only 3% to the cost. Another typical expansion (above), adds 2' to width, increasing area by 11.1% for a 4.6% in cost. Figures under room labels give before-and-after square footage. Note how room size increase exceeds total area increase, how furniture arrangement, circulation, storage are improved. Shading shows expansion.



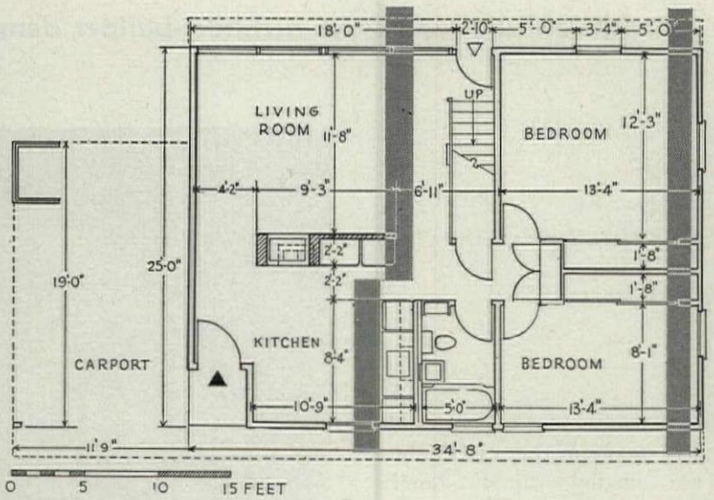


Levitts could add 132 sq. ft. for $200

Bill Levitt's office figures that 16″ (a standard stud spacing) could be added to both ends of his 1951 house for a construction cost of only $200. Since this model (plan, right) includes a finished room in the attic, some 132 sq. ft. of usable space would be added by these two increments.

The Levitts point out that the most economical way to expand their house—and most houses—is by adding to length rather than width. (Unless a house is over-framed to begin with, widening will require heavier joists and rafters, whereas the same framing can be used for lengthening.) Adding 32″ to the length of the Levitt house would require no change in windows, plumbing, heating or lighting; but a larger expansion would probably require more outlay for these utilities.

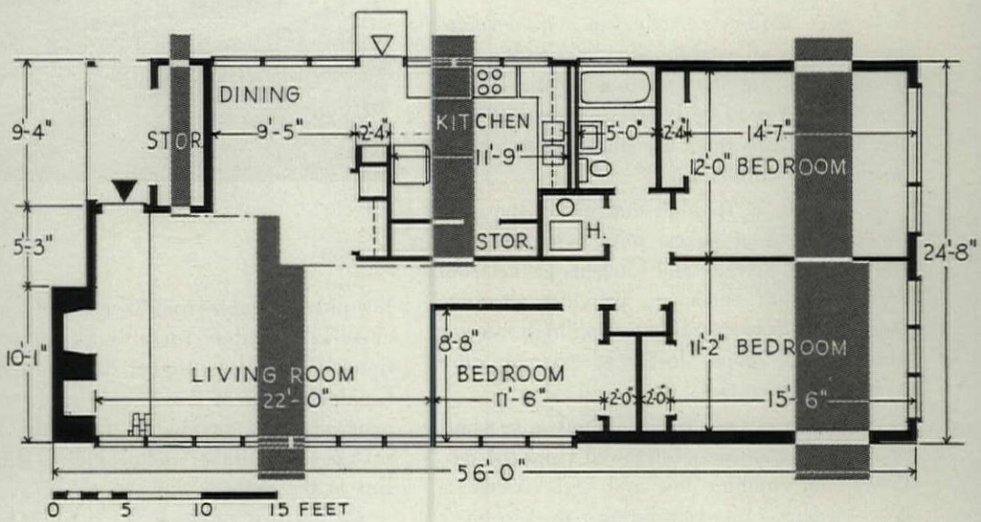
Main reason why the Levitt's haven't extended their house is that they think the present ratio between size of house and size of lot is right, that a larger house would dwarf the 60 x 100′ lot and crowd houses too close together. This may be a good answer—but only for those who believe that a 60 x 100′ lot is big enough for adequate family living.



Shaded areas (above) show possible allocation of ground floor space gained by adding 16″ to both ends of Levitt house: 15 more sq. ft. to living room, 14 to kitchen, 33 to bedrooms and closets. Labor and materials for completely finished 32″ expansion of both floors would cost only $200, since windows and utility core remain unchanged.

Bob Lautman





Framed largely in glass and solid masonry, Davenport's 46 x 25′ house contains 1,050 sq. ft., sells for $10,000, exclusive of land. A 4′ wide strip added to its center lengthens the kitchen 2′ 9″ and the living room 3′. This addition costs Davenport $419 ($4.19 per sq. ft.), raises the price to the buyer $600. A second addition of 4′ can be made through the two end bedrooms at a cost to the buyer of $500. Combination of both increments to provide 200 sq. ft. costs Davenport $747, the buyer, $1,100. The buyer gets an added bonus, because VA appraises the expanded house on the basis of the original $10 per sq. ft. cost.

Builder's experience supports HHFA study

For his 225-acre Hollin Hills development near Washington, D. C. (The Magazine of Building, Dec. '49), Builder Robert C. Davenport asked Architect Charles Goodman to design the basic 1,000 sq. ft. house so that two 4 ft. increments could be added at the buyer's option without expanding the costly utility core. (Plan, right.) Result: a house which can be made 200 sq. ft. larger for a cost of only $3.74 per sq. ft. as against $9.40 for the original unit. Eighty per cent of the houses have been sold with one or both of these space additions.

Says Builder Davenport: "In relation to what it provides, the minimum house has a high sq. ft. cost. As the builder reduces size, he soon reaches a point of diminishing returns. I'm finding that my larger houses with 2 baths and other luxury items cost no more per sq. ft. than the minimum units."

Cost breakdown for 8 ft. extension

Footings	25.00	*Roofing, flashing & guttering*	30.00
Slab	45.00	*Insulation*	20.00
Masonry	50.00	*Painting*	30.00
Wall waterproofing	1.50	*Flooring*	20.00
Lumber & millwork	150.00	*Iron, steel, misc. hdw.*	8.00
Carpentry labor	100.00	*Contingency*	20.00
Windows & glass	45.00	*Taxes & ins. 8%*	15.00
Plastering	90.00	*Job overhead 7%*	65.00
Heating	25.00	**NET COST** before profit	747.00
Electrical	7.50		

THE ECONOMICAL DUPLEX can also be handsome—and even more so

with realistic codes. An architect-builder demonstration with defense housing implications

LOCATION: Arlington, Va.
CHARLES M. GOODMAN & ASSOCIATES, Architects and Engineers
NATHAN SHAPIRO, Builder



Robert C. Lautman

Here is an architect-builder project which adds real livability and handsome lines to the low cost of that old standby — the two-family house. Because of their common utility lines (which alone saved $180 per unit), common walls and other inherent economics, these $10,600 units were built at $1.20 less per sq. ft. than detached houses of comparable quality. Though planned before Korea, their combination of design quality and economical construction points the way to better defense housing, much of which will be of duplex design.

In this 42-family Arlington, Va. development there is no need for the hung-on doo-dads which mask the shortcomings of the clumsy conventional two-family house. Instead, Architect Charles Goodman has supplied such basic assets for good living as:

1. A 900 sq. ft. plan that makes the most of every inch of space, puts living areas at the rear for privacy and kitchens at the front for control of entrances, provides adequate storage by supplementing ceiling-high interior closets with roomy low cost exterior store rooms at the entries.

2. Big glass areas which not only give small rooms a spaciousness borrowed from the outdoors, but combine low and high casements for efficient cross-ventilation in Virginia's steamy summers.

3. Durable, easily maintained finishes—brick veneer on the exterior, wall coverings of coated fabric on interior walls. (Applied to cement asbestos board, this wall fabric cost 5% more than painting, but total wall costs were $90 per house less than paint on plaster.)

4. A pleasing variation of exterior appearance achieved by staggered setbacks from the street and alternate use of secondhand brick, cast concrete brick and oversize brick.

Houses also have a skilfully engineered roof-ceiling which shows the architect's flair for blending good design and low cost construction (section, right). Rafter space above 4 in. blanket insulation is ventilated by a combination of slots under the eaves and a plenum which extends beneath the ridge beam to exhaust grilles at either end of the house. This low-pitched gable roof is not only a cheap, effective substitute for attic air space insulation, but permits higher bedroom ceilings. Goodman's use of 2 x 3″ outriggers to extend generous roof overhangs from the 2 x 8″ rafters saves lumber and provides a slim, clean line at the eaves.

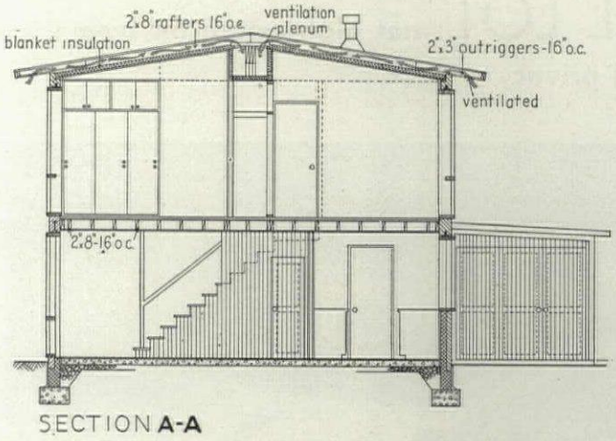
Arlington County's backward building code —worst of seven in the Washington area— ruled out an even better plan for a duplex with a wood-faced second floor cantilevered out over a brick base (see rendering, lower right). Condemned as a fire hazard, this would have provided 38 more sq. ft. of bedroom area at a saving of some $800 per house. FHA balked both at this plan and at the roof system of the present scheme. VA, however, willingly financed the final project, reduced the builder's valuation by only $100.

Formerly a builder of conventional low cost houses, Shapiro is now thoroughly sold on contemporary design and the type of service rendered by Architect Goodman. This includes not just basic planning and design, but a complete cost takeoff, materials quantity analysis and full job supervision.

All completed units in the present project have been sold, and despite a rising materials market, Builder Shapiro has realized 8% profit. Costs were $9.80 a sq. ft. as against $11 for a comparable single family house.

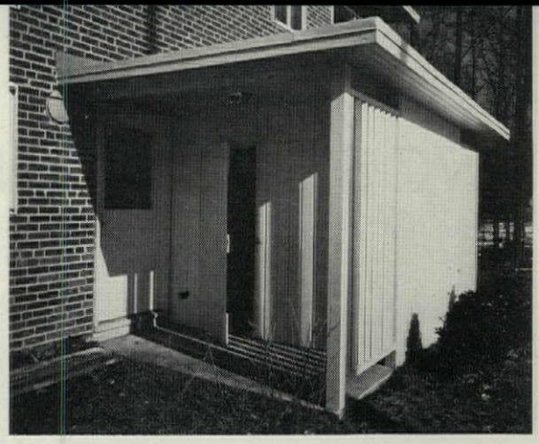
Cost breakdown per dwelling unit

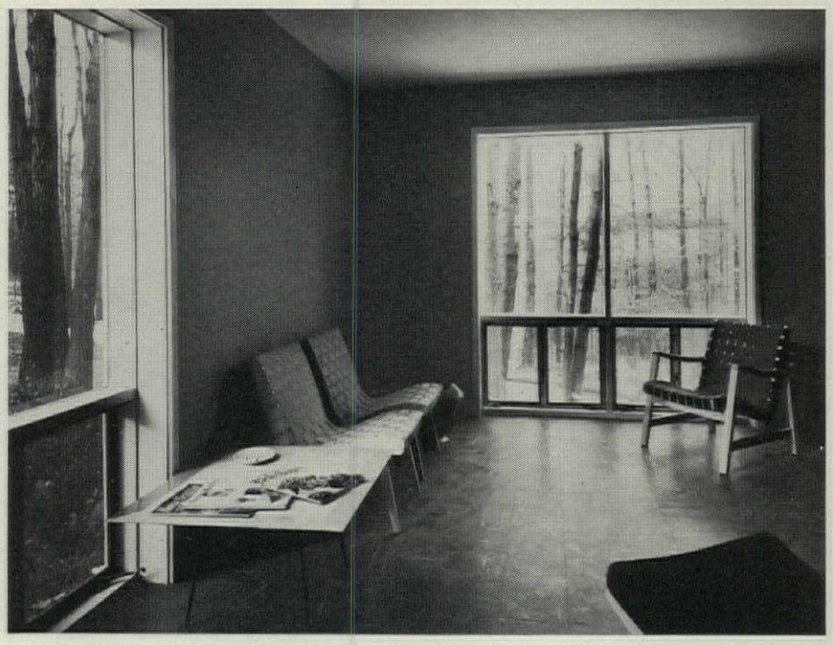
Land & sales profit	$2,198
Landscaping	167
Excavating	143
Concrete—labor & material	420
Brickwork—labor & material	1,200
Structural steel	93
Lumber and carpentry labor	1,694
Dry wall	350
Roofing, gutters & downspouts	102
Roof insulation	36
Casement windows	147
Glazing	100
Weatherstripping	19
Prefab chimneys	40
Closet fronts	85
Medicine & kitchen cabinets	189
Hardware	48
Electrical wiring and fixtures	195
Plumbing and heating	1,236
Asphalt tile & linoleum	63
Plastic tile	50
Sanding and finishing	44
Painting and calking	392
Wall fan	15
Labor—general	269
Ranges, refrigerator & washing machine	376
Architectural & engineering	163
Overhead	766
	$10,600

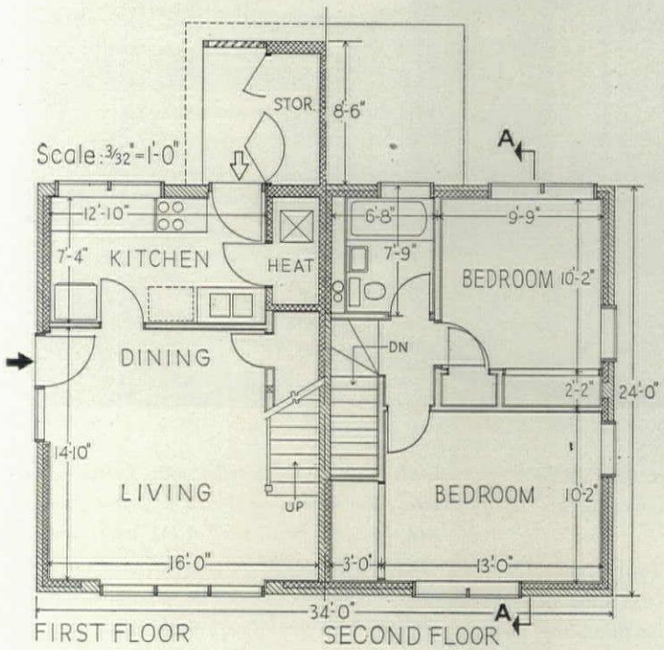


SECTION A-A

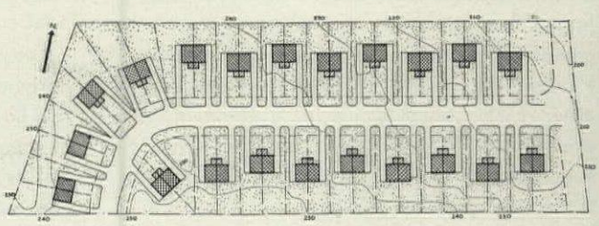
Section (left) shows air circulation in roof, ceiling-high storage units, wood-paneled open stair. Service entrances (right) are protected by louvered screens and still-immature hedges. Panels between entrances are painted in a variety of rich, solid colors.



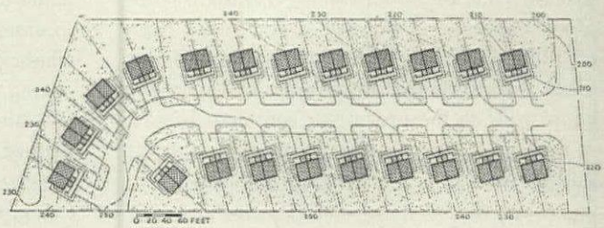


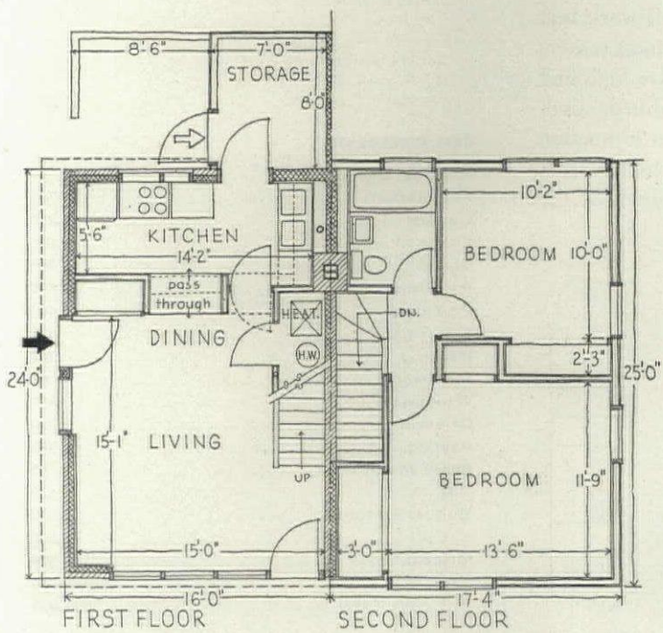


Besides requiring costly brick construction which eliminated a cantilevered second floor, local codes compelled a shift of hot-air heater from beneath stairs (below) to present kitchen position (above). This squeezed out pass-through counter, lengthened plumbing lines, put clothes closet further from the door. Cement asbestos flues also had to give way to metal flues.



County rejected original plan for angling houses to permit unobstructed views as "too unconventional" (below), accepted less desirable scheme (above).





Goodman's original duplex design (above and right) with wood-faced second floor was outlawed by the code as a fire trap.



TWO HOUSES ON ONE SMALL LOT net high return on by-passed residential property without sacrifice of good orientation and privacy

LOCATION: Dallas, Texas
JOHN P. WILSHIRE and J. HERSHEL FISHER, Architects
WILLIAM R. McKEE, Builder

How can builders make profitable use of the vacant "skip lots" which dot the old residential sections of every U. S. city?

Dallas Architect Hershel Fisher's bright answer is to put two houses on the same lot. By expert planning he not only made both of them spacious and livable, but also gave each as much privacy as if it had the lot to itself.

Fisher tested this idea two years ago with two low cost, ground-hugging houses on a 50 x 150′ lot. Result: rapid rental of both units and a net return of 15% anually on a total investment of only $9,890, including the land. Using the same basic scheme, he has since designed three other more polished but equally profitable versions for Dallas builders. Pictured here is the latest and best of these—a $14,660 pair with a combined area of 1,700 sq. ft.

An ingenious plan makes these two small houses look like one big one, yet gives each complete separation and adequate privacy. Placing the houses at right angles to each other, Fisher made space for a common carport and a fenced-in patio for each unit. A single access walk links the houses, but entrances are widely separated for privacy. Each unit has a good size living-dining area, a compact back-to-back kitchen and bath, a continuous window-wall which opens to the patio for easy Texas-style living.

Simple variations of the plan will provide good orientation on lots facing any main point of the compass. (Diagram, lower right) Each of these alternate schemes turns an almost blank wall to the hot western sun and opens the house wide to the prevailing southeast breeze.

An economical structural system enabled Builder McKee to put up both units for $8.36 per sq. ft. Included are such features as a roof that can be flooded with water to reflect sun heat, a direct exterior of common brick and stained fir siding, a brick-floored terrace. Houses are framed on a 4′ module to accommodate stock rubbed plywood panels for interior walls. Window costs were pared by using simple industrial-type projected sash except for the large fixed panes. (The projected sash under these panes are big enough to assure good summer ventilation.)

Rented at $120 a month for the two-bedroom rear unit and $110 for the smaller unit in front, the houses would earn more than 14% on the $14,600 investment after covering annual costs of $610.

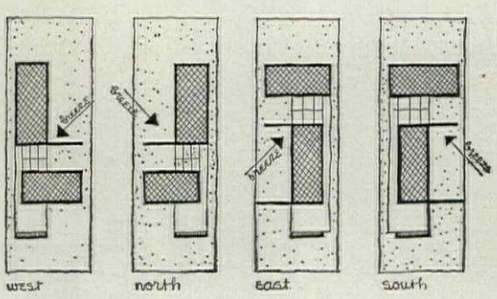
Despite the good return on the four Fisher-designed duplexes built to date, the idea of two houses on one lot is so new that financing has been difficult. Prior to its erection 13 Dallas companies refused to take any mortgage on the McKee duplex. The best offer was a $9,200 loan. But a new mortgage company's recent offer of $12,500 may be a sign that bankers will soon accept the profit possibilities of Fisher's idea.

Fisher points out that the idea is not applicable to all types of property, will work best in older residential areas near business centers where demands for rental space are high and zoning ordinances have been modified. Conservative neighbors tried to get an injunction against his first experiment, but were thwarted because all restrictions had expired in the aging, downtown neighborhood.



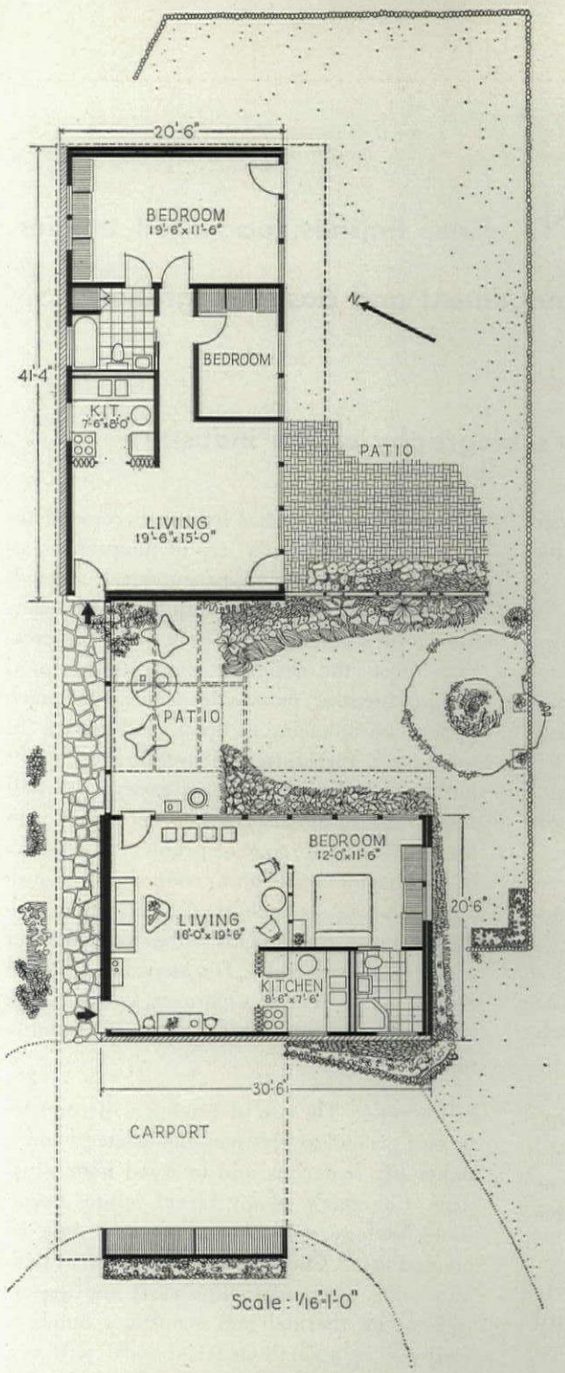
Ulric Meisel

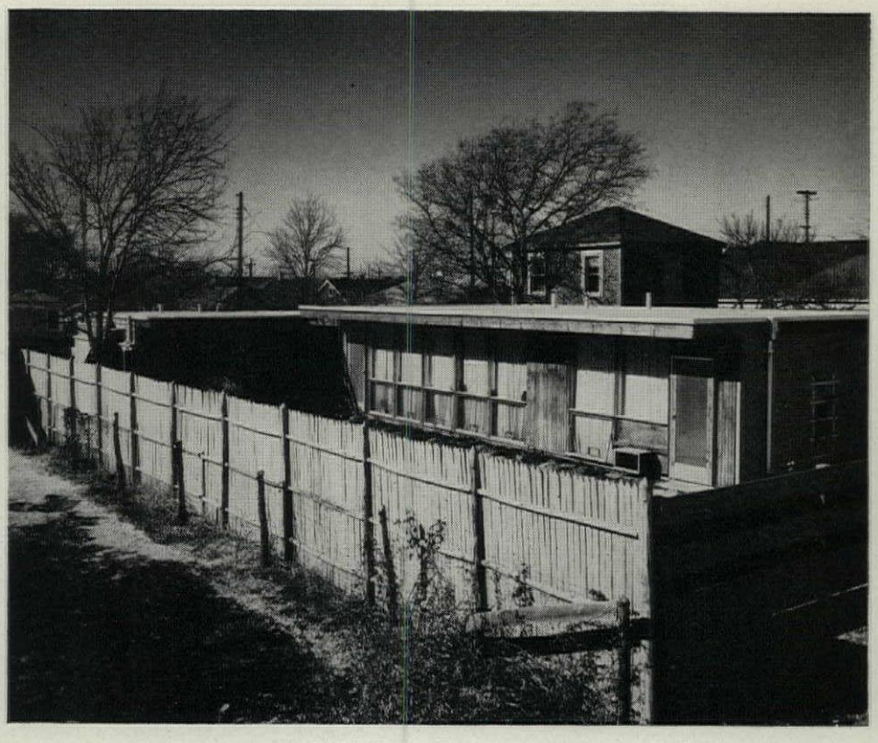
Glass wall of the smaller unit overlooks its own patio formed by slotted fir board screens and the blank brick wall of the larger house. An overhead trellis formed by extension of rafters joins the two houses structurally, will provide shade as vines grow.



Cost breakdown

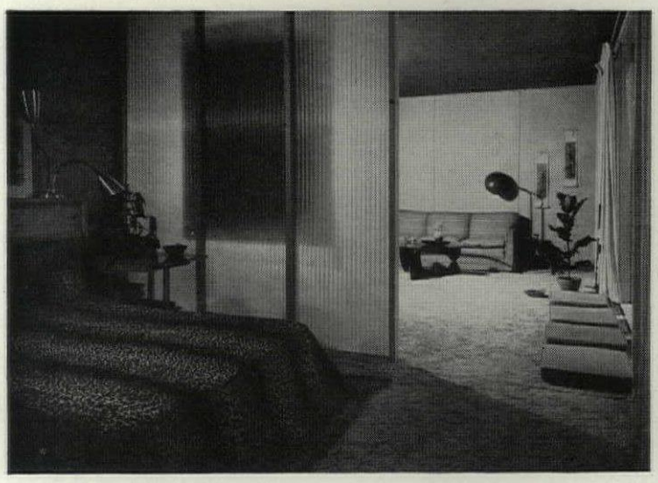
Grading and filling	$200
Foundations	700
Lumber	2,800
Labor	1,600
Glass	450
Painting	600
Plumbing	1,400
Electrical	410
Heating	180
Hardware	60
Windows	460
Driveway	300
Roofing	590
Sheet metal	190
Tile	420
Builder's profit	1,500
Lot	2,500
Miscellaneous	300
Total	$14,660

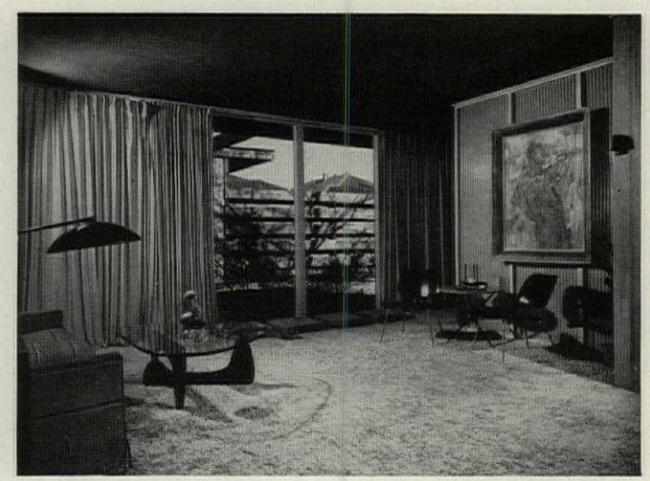






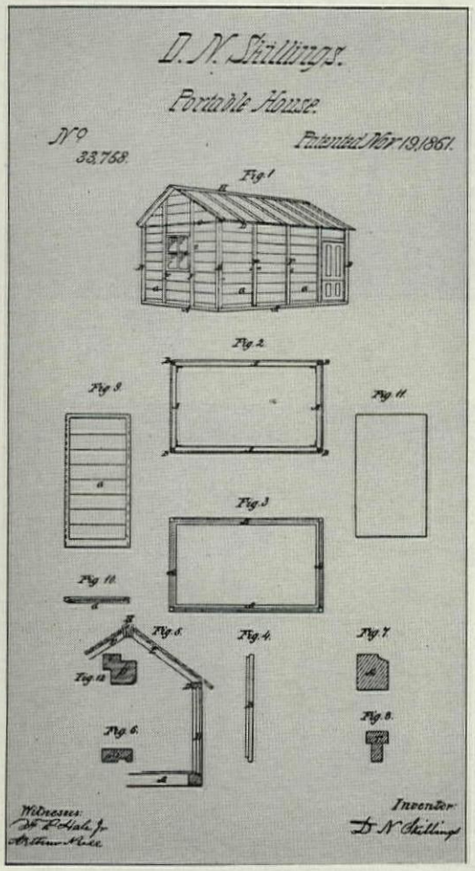
Patio of the two-bedroom house (above, right) is shielded from neighbors by a combination of wooden screens and shrubbery. Interior photos of smaller unit show spacious effect of open planning and a glass wall opening on private patio. For maximum ventilation, bedroom is separated from living area only by a screen of translucent corrugated plastic.





WHAT NEXT IN PREFABRICATION: Finer finishes, packaged utilities, simplified financing, better management and closer integration with merchant house building.

A forecast from Burnham Kelly's biography of the industry



Patent granted lumbermen Skilling & Flint in 1861 covered panelized house which is not far in design and construction from today's prefab "Cape Cod."

Prefabrication has come of age. This fact was signalized last month by the publication of its biography, *The Prefabrication of Houses* by Burnham Kelly.*

A fact-packed reference book, this 466-page tome traces prefabrication's development from its inception, through decades of trial and error, up to its present enjoyment of a modest prosperity and the promise of a substantial part in the budding defense housing program. As such, the biography is a useful yardstick of industry norms against which prefabricators may measure themselves and a guide for future adventures into the tempting but tempestuous field of house prefabrication.

But the most interesting chapter in Kelly's book goes beyond the present. He notes that, after a severe shaking down process in which the industry lost its weakest members and its strongest ones have grown stronger and crystalized their patterns of operation, the industry stands at the crossroads. Then he outlines the way ahead in a series of prognostications which make sense but may also make some prefabricators see red:

▸ *General:* ". . . it will become increasingly difficult to draw a line between prefabricated and conventional construction. At the present time one-fifth of the average house is made up of manufactured products rather than building materials in the ordinary sense. In the future more significance will attach to the degree of prefabrication than to the numbers of prefabricated houses."

▸ *Management:* "It has by now become abundantly clear that every step of the prefabricator's operations, from procurement through marketing, exercises an important influence upon every other step. The process for erection affects the design as much as that used for production; mass sales depend as much upon good financing as upon good design. In the future, therefore, the prefabricators will build up balanced staffs of experts, or will retain consulting services, in order to deal with this whole broad range of problems. . . . Much of this business will go to companies not producing houses as such at all, but rather producing large components, either of houses or of buildings generally, for assembly either at the site by individual architects, builders, and site developers, or in fairly localized assembly plants."

▸ *Materials:* The use of lumber will continue to give ground to plywood and related bonded paper ply materials and to wood fiber products. Concrete's "many recent improvements in technology will help to bring it into increased use." Clay products, "because of their increasing site construction costs and the objections on thermal and acoustic grounds to their use as a single-material wall" will continue to be little used unless their physical properties are improved and larger, lighter units are produced. Metals have a bright future in their use as finish as well as framing. Plastics "have thus far proved to be unsatisfactory basic building materials."

▸ *Panel size:* "There will be an increasing effort to prefabricate those components of the house which offer large unbroken surfaces such as the ceilings, roofs, floors, and partitions whereas today the major effort is directed at the walls. The inherent merit of frame and curtain wall structures . . . will assure their continued development also, but the light, continuous, combined-purpose walls will advance more rapidly."

▸ *Factory finishing:* "The assembly of a frame and the application of boarding offer much less opportunity for savings in construction labor and time than do the finishing of floors, the painting of woodwork, and the many other finishing details.

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* Burnham Kelly is the logical author of prefabrication's biography. He is director of MIT's Albert Farwell Bemis Foundation, whose founder produced the famous trilogy on housing, *The Evolving House*, and later the bible on modular coordination, *Rational Design*. The current book is based on the Foundation's voluminous files on prefabrication (probably the country's largest) and a field survey of 125 prefab operations conducted by the Foundation during the years 1946 and 1947.

The book is divided into three parts: 1) an editorial history of the industry with some speculation as to its future; 2) a factual report of how the industry operates and 3) a collection of detailed appendix material of primary interest to practicing prefabers. It is a joint publication of The Technology Press of MIT and John Wiley & Sons, 440 Fourth Ave., New York 16, N. Y. Price: $6.50.

▸ *Color and texture:* "It should . . . be desirable to produce surface finishes which do not require constant cleaning, no matter how easily they can be cleaned. Certainly this seems to have been the conclusion of the makers of linoleum. A little texture—a fine corrugation or processed pattern—together with an irregular color pattern might make it possible to clean less often, and in addition add improved mechanical and acoustical performance. Less uniformity should mean easier production control, and corrugation or stamping should permit the use of lighter gauges of metal. These possibilities are certain to be explored in the future."

▸ *Structural form:* "Revolutionary designers tend to feel that the logic of structural efficiency has an overwhelming appeal. There seems little reason to believe, however, that we demand a high degree of structural efficiency in the house. Architectural design involves many problems; and, in the future, basic considerations of plan will continue to dictate the structure, rather than the reverse."

▸ *Project variety:* "The industry will gradually grow away from the tendency to seek 'variety' through the application of exterior materials, details, and finish treatments to identical houses in the hope of giving the appearance of that random collection of structures which has characterized our neighborhoods in the past. . . . More important in the future will be variation in color, in placement of houses, in arrangement of the lot and street lines, and in relationships established with garages and other structures—a variation which obtains its quality from a frank recognition of the basic similarity of the houses involved. It will be recognized that, beyond a certain size (the definition of which requires study), a project of similar houses develops an oppressive monotony which no artistry can dispel."

▸ *Mechanical cores:* "The mechanical services and equipment of the house represent from about a third to as much as half of its production cost. It is certain that the effort to design these as a unit core and to mass-produce such units in ever larger components will continue. In the next few years development here may come even more rapidly than in rationalization of the rest of the structure."

▸ *Distributors:* "At present, few prefabricators make use of distributors in their distribution channels, but the likelihood is that more will do so in the future."

▸ *Selling:* "One of the great advantages which the prefabricator can offer is the simplification of the various steps through which the individual purchaser must go in order to buy a house. This should start with the establishment of a fixed price. In the future, prefabricators will not continue to allow dealers to establish prices in their own locale. The stronger firms already have their dealers quoting prices from a fixed schedule under their control, and those firms will do best in the leaner days ahead which can advertise the price of a house (less freight and lot) on a regional or national basis."

▸ *Financing:* Unquestionably the emergence of well-advertised brand-name houses, in combination with a continued or expanded program of government mortgage insurance, will tend to turn the mortgage into a more negotiable form of earning asset. This will fit in with the growing tendency for families to purchase houses out of current income rather than savings. It is possible that the trend will be in the direction of forms of tenure and home financing which combine ownership and tenancy in some manner, as, for example, the purchase-option plan. Prefabricators may be the first to introduce such a scheme on a wide basis. The nature of interim financing (short-term or construction financing) may be expected to alter as the house is increasingly industrialized. A common future procedure will be the combination of chattel and real estate mortgage financing in which a finance company will pay the prefabricator for his package at the time of shipment, advance funds to the dealer for site improvement and erection and completion of the house, and sell the final mortgage to portfolio investors. In this way the final mortgage lending institution does not enter the picture until the completion and sale of the house, and interim financing is secured less and less by the house itself and more and more by the general assets of the growing prefabrication enterprise."

Throughout Kelly's predictions runs the underlying hunch that the future of prefabrication per se is grim, that it may be swallowed up by its mother industry. To wit: the "quick utilization by others of his developments . . . illustrates that the prefabricator may serve primarily as an agency for the first substantial penetration into the building industry of modern mass-production theories." And again, "It may well prove in the end that prefabrication has been only a local and specialized advance within a broad process of industrialization and that there will be little point in trying to decide whether or not a housing process can properly be called prefabrication."

Author Kelly bases these conclusions on his thorough research into the history of prefabrication and his study of the industry's successes and failures.

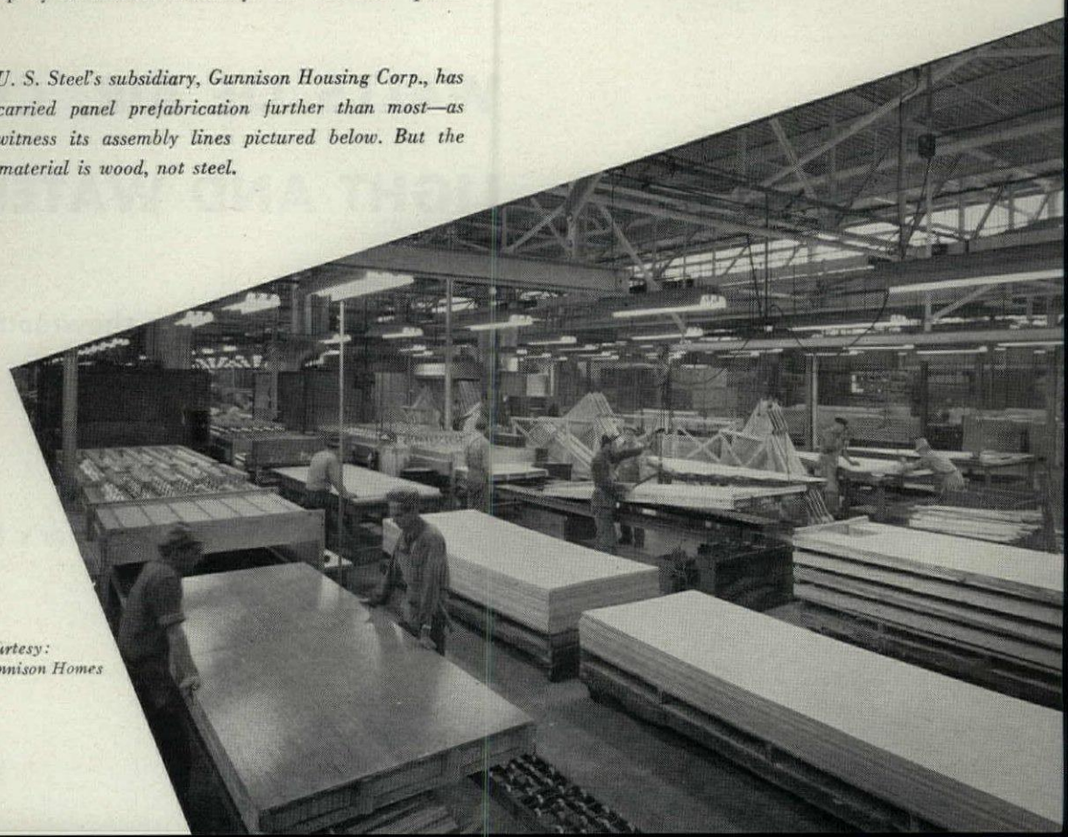
The Pilgrims and prefabrication

While prefabrication's U. S. history actually dates back to 1624 when the English brought a panelized house to Cape Ann, its first real impetus came with the Gold Rush of 1848 when houses were exported to California from all over the world. The New York area alone produced some 5,000 houses for shipment to California. (Houses which cost $400 each on the East Coast were delivered on the West Coast at $5,000 each!) In 1861 lumber dealers Skilling and Flint of Boston and New York received one of the industry's first patents—a system of building houses from a few standardized panels and interchangeable parts. The design of this pioneering house (see cut) is mirrored to a striking degree to its progeny of today—a fact which does not speak well for a century of progress. Moreover, Messrs. Skilling and Flint claimed that they could assemble their house in *three hours*, a boast no one since has dared equal.

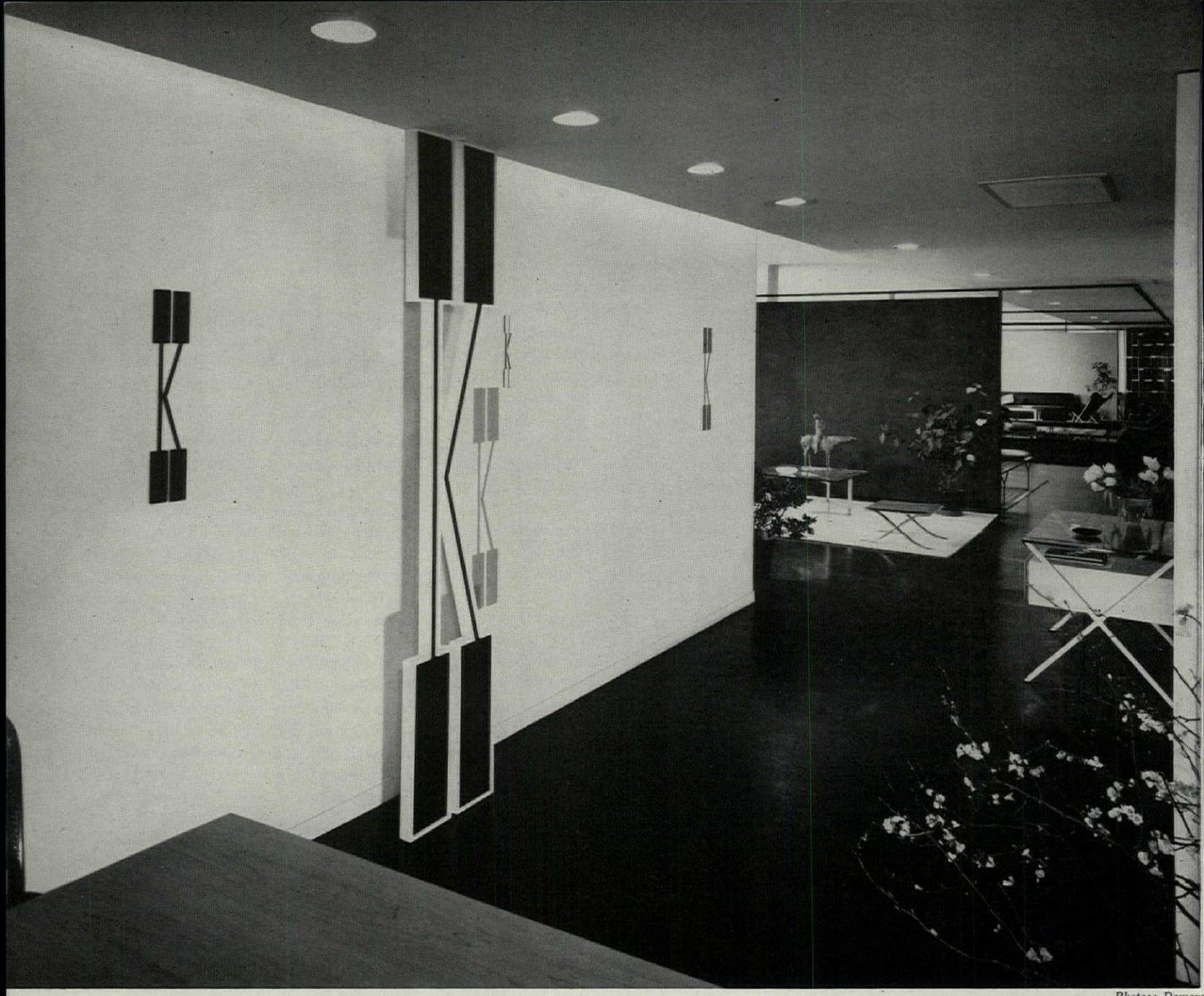
The oldest known prefabricator still in business is E. F. Hodgson Co., which was organized in 1892 and merged with Allied Housing Associates Inc. in 1944.

(Continued on page 266)

U. S. Steel's subsidiary, Gunnison Housing Corp., has carried panel prefabrication further than most—as witness its assembly lines pictured below. But the material is wood, not steel.



Courtesy: Gunnison Homes



Photos: Damora

WALLS OF AIR, COLOR LIGHT AND WATER

Knoll's new furniture showroom
is outstanding example
of interior camouflage,
proves that a good designer's hand
is quicker than the eye

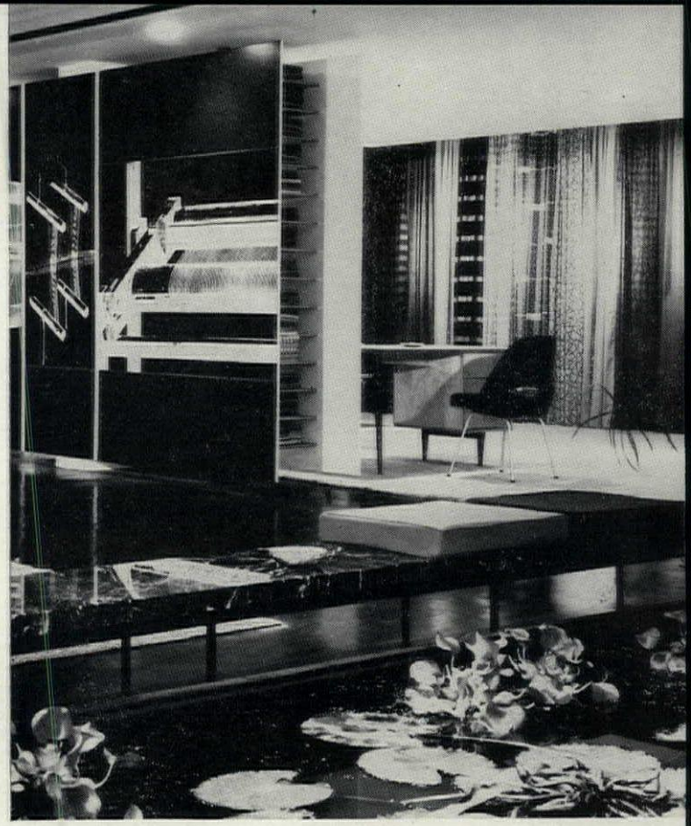
"Of course I am only a builder and don't specialize in layouts," said New York's high-powered landlord Harold Uris, "but this is absolutely magnificent!" He had just taken another look at what had been happening to the 22nd floor of his latest and best-looking office building in midtown Manhattan. And though he might be "only a builder," New York's critics, esthetes, designers, architects and other spectators agreed wholeheartedly with Harold Uris. They came back for another look—again and again.

Cause of all this hubbub on Madison Avenue is the new Knoll furniture showroom (with offices and planning department attached.) That showroom proves, among many things, that architecture can be produced with air, color, light and water—or even with fish net, paper, bamboo, grass, pressed wood and 15 cent plants that grow in New Jersey.

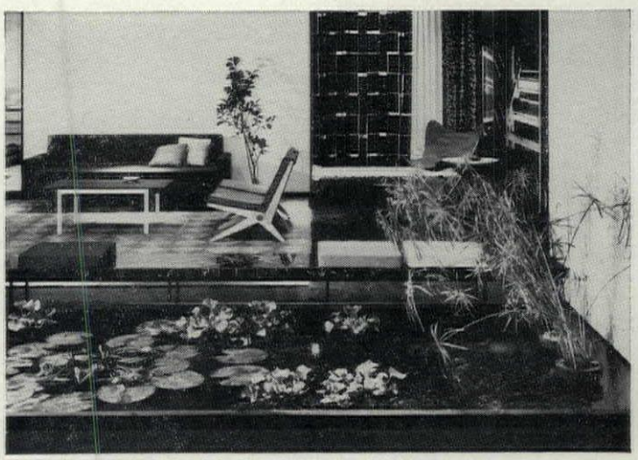
By the time a Manhattan ziggurat staggers backward and upward to its 22nd floor, the floor plan has probably received quite a beating from setback restrictions. They may have knocked out a corner here and there, nibbled away at one side or another, and, in addition, confounded most attempts at regular column spacing.

Into just such a floor Florence Knoll brought an impressive measure of order. Her first step was to "paint out" the structure with a few coats of flat white and to "paint out" the horizontal strip windows in the showroom by covering them with floor-to-ceiling sheets of glass fiber on curtain tracks. The glass fiber cost a mere 57 cents per sq. ft. installed with all hardware, did three things in addition to hiding the windows: It diffused the direct sunlight, it cut out the yellow light reflected from the IBM Building across the street (which would have discolored the displays in the showroom), and it blocked the view of the outside which would have detracted from the furniture on view inside. To keep the glass fiber sheets from looking dead and flat, the designer covered them with a row of fish net curtains that make the whole wall look like a rich expanse of luminous, white drapes. Finally, to conceal existing doors to washrooms and storerooms.



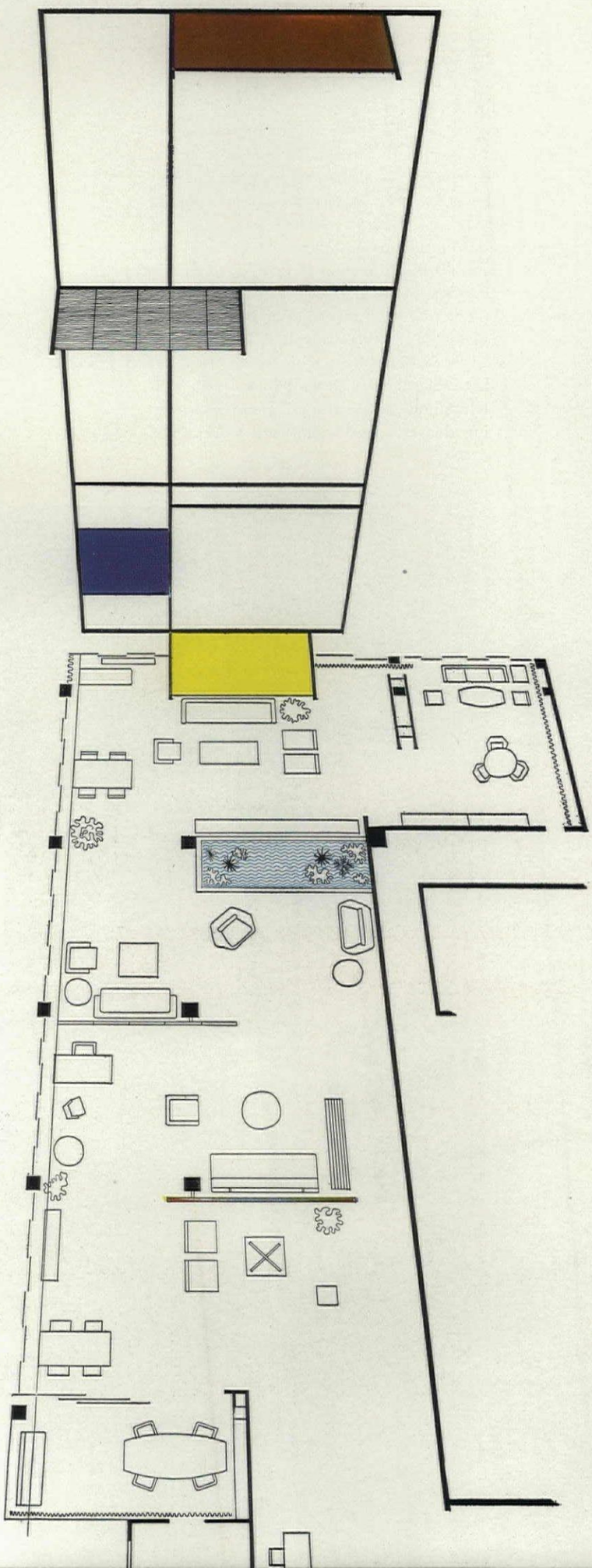


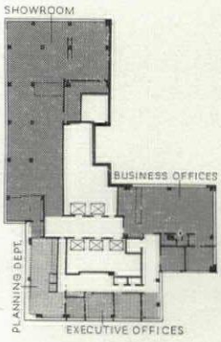
Shallow reflecting pool separates furniture from fabric displays, cost $770 to build. It is the focal point of the showroom.



View from showroom (below) shows conference room beyond sliding doors. It is used for consultations with clients.







designer Knoll omitted all handles and locks, merely indicated the position of doors with a broad vertical stripe of color, a "push-plate" painted onto the edge of the door itself.

These devices effectively killed most of the existing architecture, left her with a white, 7,500 sq. ft. sketching pad on which to outline the kind of setting she had in mind.

This setting (like any other manufacturer's office) had to accommodate several distinct operations. In the case of Knolls there were four: The *showroom* was given the north and west exposure; the *planning department* with its drafting room was allotted a sliver of space to the south, between service core and west wall; along the south facade were placed the *executive offices* and conference rooms; while the northeast projection of the building, with a striking view across New York East 60's and toward the East River, was turned over to the *business office*.

Having thus divided up the available space, the designer developed each area to serve its purpose.

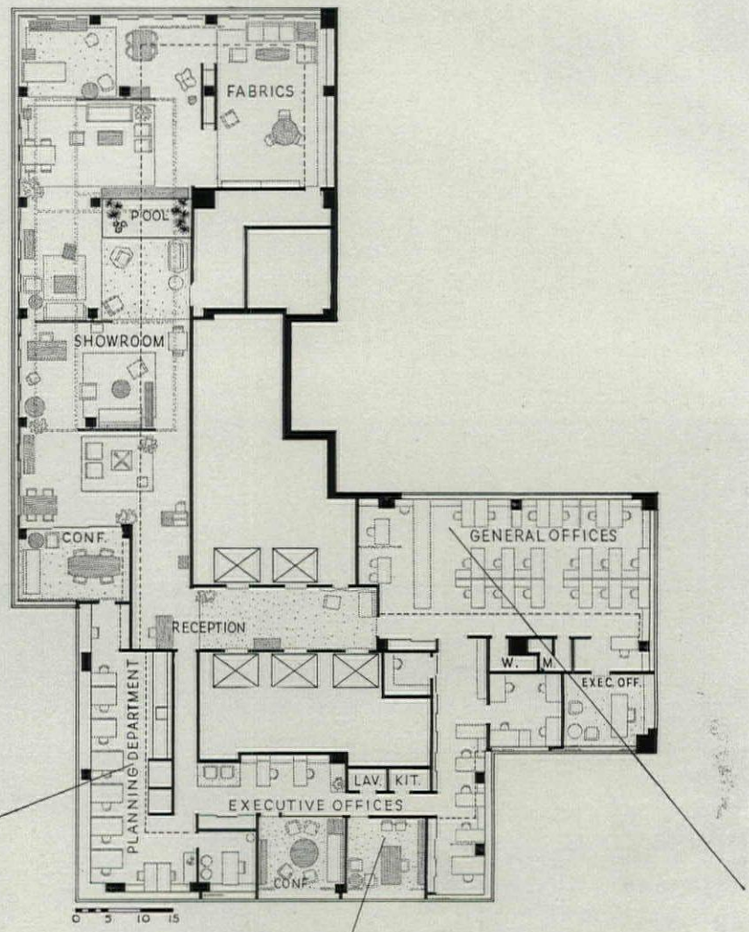
Showroom

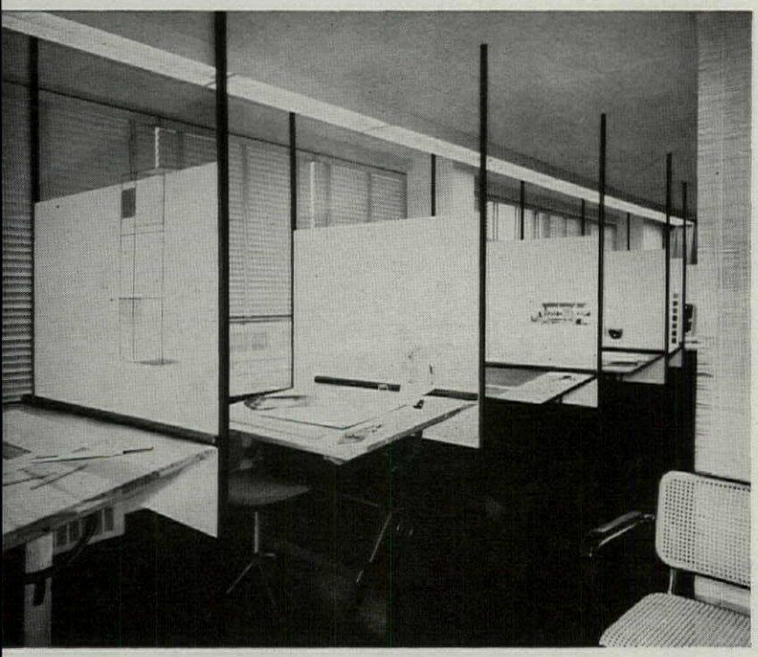
Furniture, like some other equipment, is generally used in groups and is best sold in groups. To give the illusion of room settings, most stores construct open-ended booths that look like shooting galleries at a country fair. In the Knoll showroom there are no walls; instead, there are eleven islands that float in the white space. Some are defined only underneath with a textured rug; one is defined only above by a paper-core panel painted bright blue and hung from the ceiling to hover above a group of chairs and tables; still others are defined only on one side by a free standing screen, a curtain of bamboo slats or a "wall" of patterned fabrics. But the most exciting device of all is a shallow reflecting pool, 6 ft. wide and 13 ft. 6 in. long, filled with small tropical plants and flanked by a bench of polished blue Belge marble; it is both a strikingly unexpected focal point of the entire display, and an effective barrier that bisects the extended



Space modulator of black steel channels is trademark of Knoll showroom and final, sure touch that pulls together all the many open groupings of furniture. It can be used to hold plywood partitions and floating ceiling panels. Cost: $2,000.

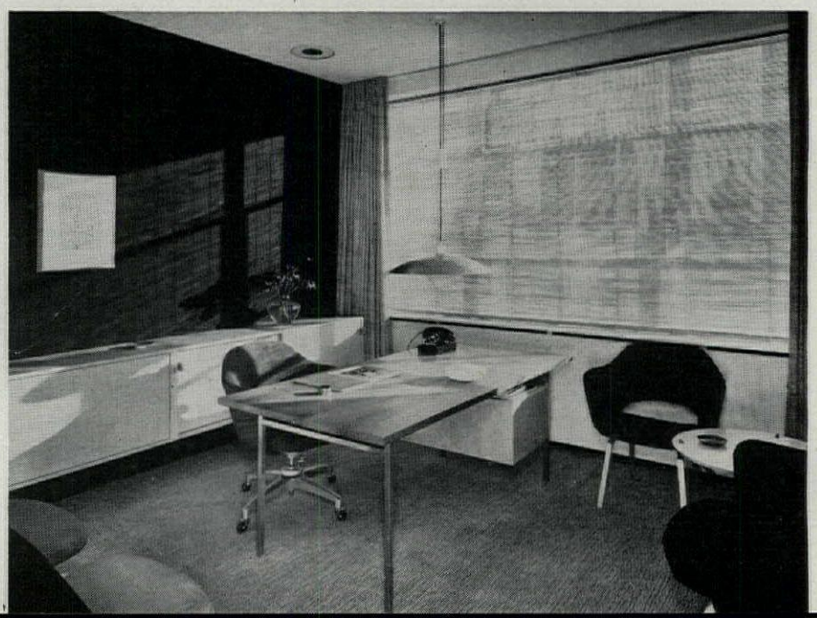
Plan of entire floor shows 11 distinct islands of furniture in the showroom space. Orders are taken in closed-off area adjoining fabric display. Operations offices are to south and east of elevator lobby, comprise planning department, executive offices and general business office.





Plywood panels set in steel channels separate designer's drafting tables, give each a tiny studio of his own. Panels and walls are white throughout, permit designers to see paint and fabric samples in true colors.

Firm's head Hans Knoll works in front of black wall in home-like office setting. None of the rooms are large, but small-scale furniture gives impression of great spaciousness.



showroom and divides furniture from fabrics.

Such walls of air, color, light and water have been used before, notably by Mrs. Knoll's erstwhile teacher, famed architect Mies van der Rohe. What Designer Knoll has added to these magic devices is a light cage of black steel channels—a spidery pattern that appears and reappears in every corner of the showroom, both as a grid suspended from the ceiling and as posts holding up a translucent screen here, or a solid panel there. By virtue of its color-contrast, this black cage modulates the entire space, creates an architecture of its own that is as delicate as a Japanese pavilion and yet vigorous enough to blot out the existing structure.

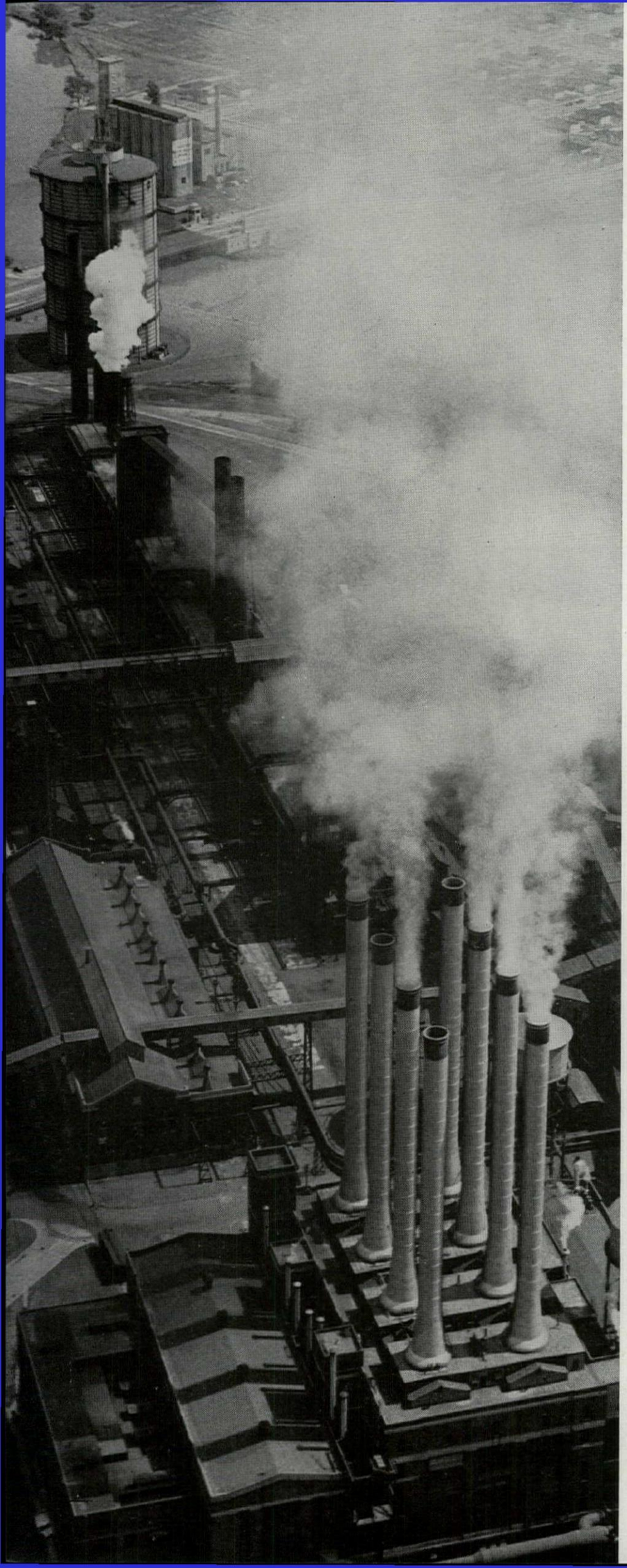
Operations

Behind the scenes of this colorful stage set there is an efficient and well-planned operations section. It differs from the usual business office in three important respects: First, it gets away from the usual slick, metallic décor that makes so many executives conduct their business in the nearest men's bar, achieves instead the comfortable atmosphere of a study at home. Secondly, it makes a limited floor area look big by utilizing small-scale desks, chairs and tables in place of the monumental furniture found in most offices. And finally, it again subdivides the major areas with purely imaginary barriers — screens that form visual separations only, waist-high partitions that turn each secretary's workspace into a private cubicle.

If there remain some problems of glare-control, of sound-control and of artificial lighting, they will be taken care of in due course. For these designers will continue to experiment upon themselves. If the Knoll showroom has one overriding characteristic, that characteristic is the cheerful and optimistic welcome it seems to extend to future change in requirements and future change in technology. It is a truly modern design lab. And the guinea-pigs are doing fine.



General business office has 18 small maple desks with gray plastic tops. Low partitions covered with grass matting turn working areas into pleasantly warm studies, create an illusory space division for added sense of privacy. Ceiling is acoustic.



TODAY'S INDUSTRIAL

A single great architect-engineer firm designed $300 million worth of the plants now mushrooming all over the land for private U. S. industry. In addition, it is working on what is probably the world's largest industrial project, a $270 million plant for the Atomic Energy Commission.

This biggest of all architect-engineer collaborations is known as Giffels & Vallet, Inc., L. Rossetti. (The first two are engineers—the third, unincorporated, is the architect.) Together they typify in macrocosm the new integration of architectural design with all the engineering specialties—the integration Richard Neutra has warned his fellow architects to master if their profession is to survive.

In every big building job today the electrical and mechanical services have become costlier and more important than the structure. Perhaps more than anyone, Giffels & Vallet and Rossetti have sensed that the building—whether factory, office or store—is itself part of the process of production or distribution—that there can no longer be a clear division between process and plant in design, in construction, or in operation.

This welding of building and process will soon be accelerated by two great developments now looming over the industrial horizon: the use of atomic energy for industrial power and the use of electronic "brain" controls to realize the old dream of the completely automatic factory.

Very few architects or engineers can aspire to create so vast an organization as Giffels & Vallet, Inc., L. Rossetti. Only a handful of industrialists can hope to employ such an aggregation of talent. But every engineer and architect, every industrialist can learn much that it is important for him to know from a better understanding of the principles and personalities which have made this integrated firm great. These principles and personalities are revealed in Part I of the story which follows. Similarly, every architect, every engineer and every industrialist can learn much that is important to him from a careful study of some outstanding examples of the G & V method as presented in Part II, which begins on Page 153.

The Rouge, Ford powerhouse in foreground

BUILDING: a blend of architecture and engineering, of plant and process

Giffels & Vallet, Inc., L. Rossetti have mastered this formula

Giffels & Vallet, L. Rossetti—by origin, by experience, by personnel and by method of work—is a firm peculiarly equipped to deal with the kind of building where nobody can say just where plant leaves off and process begins, a job very different from measuring off so many bays this way and so many that and the manufacturer will install his own machines, thank you. One of the first things to say about G & V is that it is a Detroit firm.

You can look in New York for the great bridge and highway engineers, in California for the dam and pipeline engineers, in Boston for the hydroelectric engineers, but you must go to the metal-working cities that stand around the Great Lakes for the men who know how to build factories. Grim, gangling Detroit, where most other buildings seem to hover nervously along the automobile through ways, is the birthplace of the modern factory: the one building type in which the U. S. knows no peer and the one in which the great technological innovations affecting all other kinds of building have occurred.

Henry Ford, as every school child knows, had one simple aim in life: to build a completely practical automobile. When he got around to thinking about the factory in which to build this automobile, he quite characteristically demanded a completely practical factory too.

Now Ford had spent his life with power drills and electric screw drivers and other machines which worked precisely, continuously and automatically, and it simply did not occur to him that he was colliding with an operation rent by both professional and trade schisms and by methods so nonautomatic as to be almost medieval. Ford did not know it, but his "perfect" factory demanded what was conspicuously absent from the building industry of the day—an integrated professional organization able to take undivided responsibility for the design of all the specialized mechanical services and for relating these to the building itself.

It is a high testimonial to what is sometimes called the "art of architecture" that this building organization and method grew from the head of a great architect, Albert Kahn. The engineers who built the bridges, the dams and the highways might thumb their nose at the architects. But in factory building, where the less easily measured requirements of human beings were as important as the stresses of wind, water and load, the architect stood from the beginning in close partnership with the engineer.

Pierce Associates



Partners Victor Vallet, Louis Rossetti, Ray Giffels

While Henry Ford was building his one-story factories, Ray Giffels and Vic Vallet were leaning over adjoining drafting boards in the great office of Albert Kahn. They were young structural engineers, and their first job with Kahn was designing steel skeletons for the factories that were shooting up all over the Detroit area. It was a hard school. All Kahn's men learned very soon that the bellow of the auto men—"Pro-o-duction!"—was to be their first principle as well. Inexhaustible Albert Kahn set a killing pace, and what in other architectural offices was an occasional charette became here a regular, machine-like process. Both Giffels and Vallet got on well with Kahn, and Vallet, a handsome man of few but piercing words and of almost uncanny exactness, gradually rose to be in charge of shepherding all the ticklish Ford work through the office.

Oscar Pocock and Ray's younger brother Bert Giffels, both already known as brilliant engineers, were in the Kahn office, too. Bert spent seven years on one of the

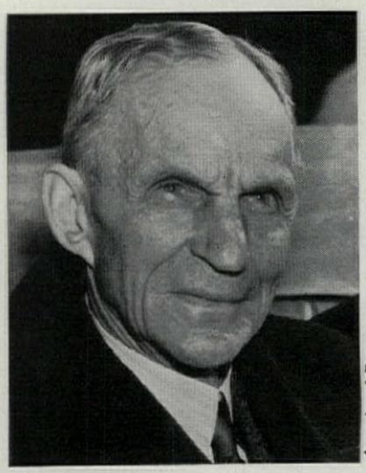
biggest jobs of all: the integrated steel mill Ford built when he decided to establish better control of his costs for this prime raw material.

As the building boom roared to its crescendo in the mid-Twenties, Ray and Vic decided to go on their own. (Oscar joined them a year later, Bert stayed with Kahn for four more years to see the big steel mill job through.) At first their backlog was structural steel design for achitectural offices, but when the big powerhouse changeover came up at the Rouge (converting from low pressure to 1,400 lb., 900° steam), a Ford representative suggested that Kahn sublet this difficult work to the young men on whose performance he had learned to rely. "By 1929," Vic Vallet says, " we had 200 men, and 80% of our work was doing tough jobs for Ford."

G & V have been famous for the "dirty work" ever since. "Dirty work" is what engineers call process work, the kind of machine or handling or piping installations nobody has ever worked out before—the tough jobs, "the kind you have to fight."

The firm's early concentration on process work—"a manufacturer tells us what he wants to do and, if necessary, we design the machines, piping, conveyors and anything else he needs to do it"—is now paying dividends.

For example: when the new construction problem of building aircraft engine test cells came along in the last war, engine manufacturers could find plenty of architects able to design the concrete shell and a good many engineers equipped to tackle new problems like setting up instruments to measure every phase of engine performance, designing equipment to feed air and fuel in controlled proportions and to silence the artillery-like roar of 40 or 50 of these engines running at one time. But in Giffels & Vallet they found a firm adequately equipped to tackle all of these problems at once. Today, among others, the National Aeronautic Advisory Commission is relying on G&V's vast experience in "dirty work" as their research moves to the horizon of what is known about the effect of supersonic speeds on engines and pilots.



Associated Press

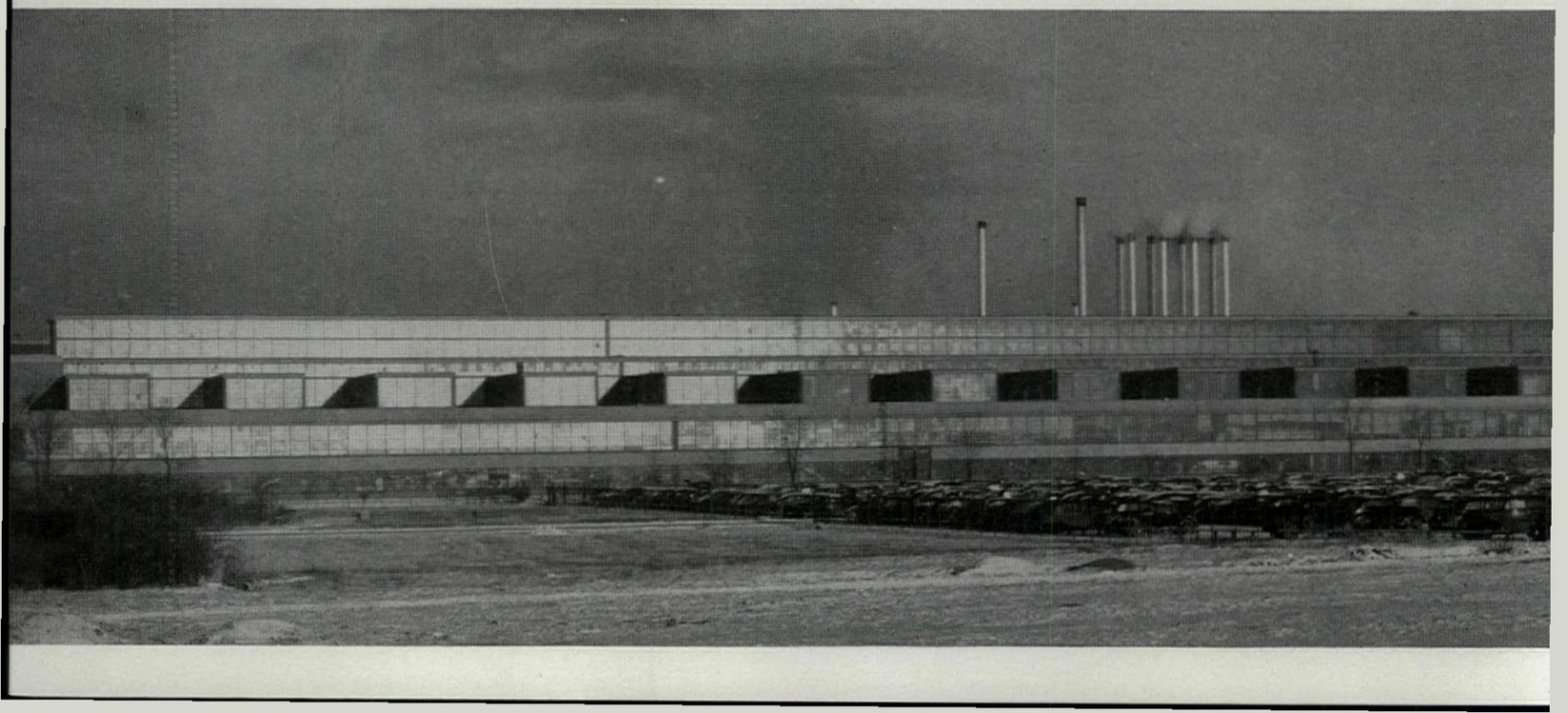
HENRY FORD: it had to work

One reason why this firm was among the first to see the factory building as a production machine is that it is designer to Big Industry. Most industrialists are lucky if they build one new factory building within their working lifetime. Whatever they learn in the process cannot be applied, because there isn't any next time. But the big industries maintain active, continuing building programs, spending millions year after year in plant improvement and plant expansion. The great majority of G & V's clients are repeat customers. This means that the firm has grown up in step with the development of a half-dozen basic industries. Some G & V men can match the plant operators themselves in intimate working knowledge of the factories they design.

Some of this know-how accumulated because G & V never turned up their noses at the tough, unglamorous jobs of plant alteration and improvement. Industry spends many times as much for these ticklish jobs as for the new buildings which become architectural showpieces. To help a manufacturer figure out what he can do with an old plant to help him meet cost-cutting competition, G & V engineers sometimes have to learn as much about his industry as the owner himself.

Moreover, the owner of, say, a steel mill doesn't want to shut down while alterations are underway. New

Tool and die plant, the Ford Motor Co., Dearborn



equipment must be added a piece at a time, and the job must be designed and scheduled so that as each piece comes in, the foundations are ready and the various services are brought along at the same time. G & V do a lot of alteration work in the steel industry, including the 30% increase in capacity now being added to the Ford steel mills.

When the war came

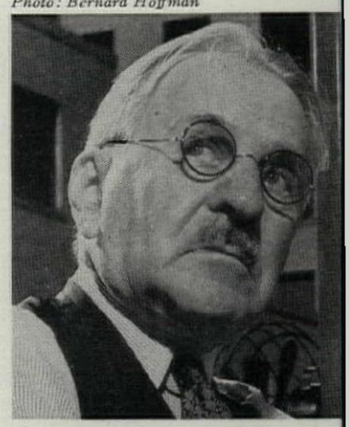
At the start Giffels and Vallet's big idea was to broaden the professional design services then available —by offering the manufacturer a complete service which would include not only design of the factory building and services but also, where needed, design of the handling equipment and even of the tools themselves. To do this inclusive job they had to assemble a staff of highly specialized design talent, and to whack out some way of work which would permit these brilliant and often individualistic professionals to operate as a team.

Perhaps the reason why the G & V office became a place where it was easy for architects and engineers to mesh their talents is that, unlike the office of Albert Kahn in that great architect's working lifetime, it was never a one-man show. From the start, partners Vic Vallet and Ray Giffels seemed to hit upon an easy division of aptitude and responsibility. This division became extremely useful in the World War II period when G & V grew into a really big firm, (1,100 employees at peak).

The firm had just climbed out of the depression shutdown* when Ray Giffels went to Washington in 1939, with a firm belief that war was coming and that the U. S. would need to expand its industrial plant beyond anything yet dreamed of. He had no political introductions and no other special equipment for making Washington "contacts" except a large amount of personal charm and the unshakable conviction that only among the great Detroit firms like his own could the nation find the skill to do the building job that had to be done.

It was a year before G & V got the first job; this was a $4 million nibble from the Navy (which later turned into $200 million worth of dock and airport facilities in the Norfolk area). After that, the jobs came fast. As both private industry and the government swung into the epic job of building $25 billion worth of war plant, dozens of new customers found in G & V's knowledge of basic industrial processes and in its well-rounded organization the kind of performance they urgently needed.

Photo: Bernard Hoffman

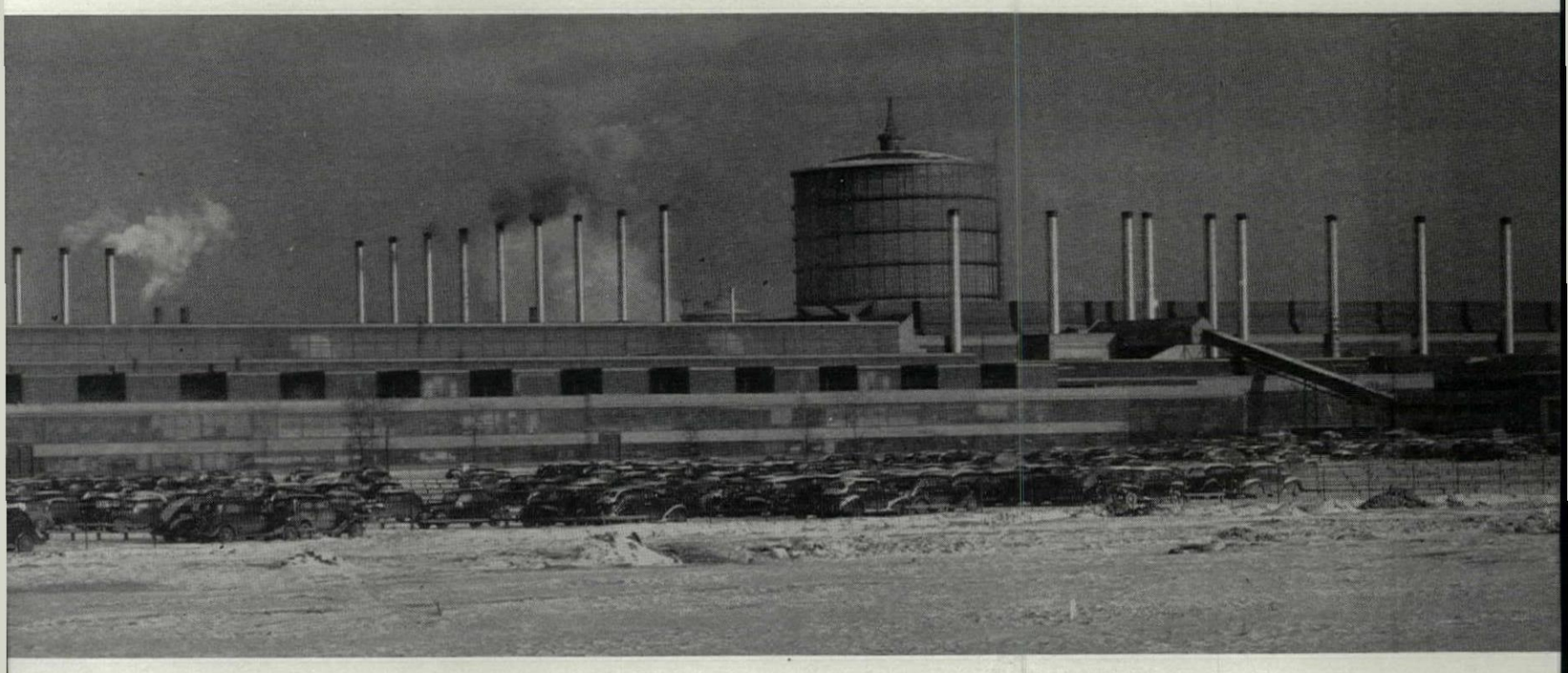


ALFRED KAHN: from his head

Ray Giffels slept in airplanes for five years; he set up and supervised design offices all over the country. Supervision of all other-than-main-office operations, including the big AEC projects, is still his part of the partnership, with which he is very well pleased. "I like to be out stirring up new things," he says. "There's no use for Vic and me both to sit in the main office, taking turns on who's going to make the next decision."

Not long ago architect Richard Neutra warned his fellow architects that they are risking extinction if they continue to ignore the extent to which modern building demands an integration of architectural design with all the engineering specialties. Neutra meant more than a reluctant parceling out of building services to a bevy of independent engineering firms—with the building shell

* The firm shrank to three men in the Thirties: Vallet, Rossetti and Pocock, who sat behind closed doors designing alternate systems for non-existent buildings (the research paid off later). Some say the reason why Vallet insists on keeping 10% of the firm's total volume in schools, hospitals, churches, etc. is his acute memory of the days when the auto plants shut down and G & V's bright young engineers and architects went to work in WPA ditches.



already frozen as an architectural design. "You will not be soloists," he told the architects, "you will have to play in a symphony orchestra."

The reason why G & V brilliance in engineering has not shoved the firm off balance is a 56-year-old Italian-born architect, who has never been known to raise his voice.

"Rossetti's no prima donna," the staff engineers say, still a little incredulous after all these years. "Oh, he knows how to get his way, all right—if it comes to something like whether the sash height is going to be in a certain proportion to the sill wall or whether the employees are going to come in here or 50′ farther down the line. But if you find you can't build something, Rossetti will come up with the answer."

If Vallet is the lightning force, glancing now here, now there all over the office ("When Vic gets on a job, it moves."), Rossetti is the patient arbiter—suggesting that the pattern of employee circulation set up by the machine layout is unlikely to yield maximum efficiency or reminding that today the greatest amount of employee relaxation in nonproductive plant areas is almost as important as the greatest amount of efficiency in productive areas.

Rossetti was educated in Berlin and Rome in the yeasty days after the first World War. These were the days when the young architects made pilgrimages to Peter Behren's Berlin turbine factory, flushed with excitement over the drawings of Frank Lloyd Wright's massive Larkin building and traded news on what Walter Gropius was doing with the new industrial techniques and materials at the Bauhaus. Coming from this innovating ferment, Rossetti was able to see the rank growth of industry as the most exciting force in the U. S. and he was soon drawn to Detroit, where he got a job at the Ford Co. When G & V got the job of designing Detroit's first commercial airport in 1929, they asked Rossetti to join their young firm as architect in charge of the project. He has been there ever since, quietly doing what more and more architects now see as the real architectural job: the job of making sure that the separate contributions of all the engineering specialties make sense in combination.

Where the specialties meet

Although the G & V office operates with machine-like precision, it would be hard to draw an organizational chart. Lines of authority and of production flow are not fixed; they may shift or even reverse themselves at a moment's notice as one specialist after another steps forward to take leadership according to the demands of the job. The nearest thing to a permanent coordinator of G & V's talent is Oscar Pocock, the chief engineer. Pocock is an extremely quiet man, who moves easily from conference to conference. "He can analyze a problem faster than anybody I've ever seen," says one of his fellow engineers. Pocock is a master of those places where the engineering specialties meet each other; he is the reconciler who suggests that the structural design might give a little here to permit the electrical men to get in or who draws some flash of insight out of his vast experience to break a deadlock between the demands of two specialists. "No matter how big the job," says Pocock, "it always breaks down into a lot of little ones if you look at it in the right way."



Robert J. Anderson

SPECIALISTS CONFER: *(l. to r.) Bradlee Pruden, Frank Sharrow, Harry Stihler, chief engineer Oscar Pocock, Norman Laing. Louis Rossetti.*

Size of the job

Old-timers like to say that there's no real money left in the practice of industrial architecture. "Time was," they contend, "when you could get 10% for a couple of drawings. Nowadays, you have to detail every hole in the floor and even the threads in the lock nuts." This view is a kind of perverse testimonial to the vastly increased complexity of today's industrial design job.

One way of sensing the size of this job is to examine the simple physical facts of a big firm like G & V, where over 800 men are now employed. The main office occupies four floors in Detroit's Marquette Building. Here in the architectural drafting room, where chiefs Burton Harrison and Harry Stihler and their draftsmen lean over the boards, you will see a double file of blueprints stretching for some 50′. Here hangs a complete set of working drawings for every job in the office. Last month the count of jobs on hand reached 150.

But the architectural drafting room is only one of five drafting rooms, each one representing a major division of the firm's work. Others are: structural engineering under Frank Sharrow; mechanical engineering under Bradlee Pruden; electrical engineering under Norman Laing; industrial engineering (which designs machine installations and handling equipment for any industrial process ever heard of or any new one that anybody can think up) under R. I. Jones.

All these major divisions are duplicated in another Detroit office in the National Bank Building, where, under heavy security provisions, G & V men are turn-

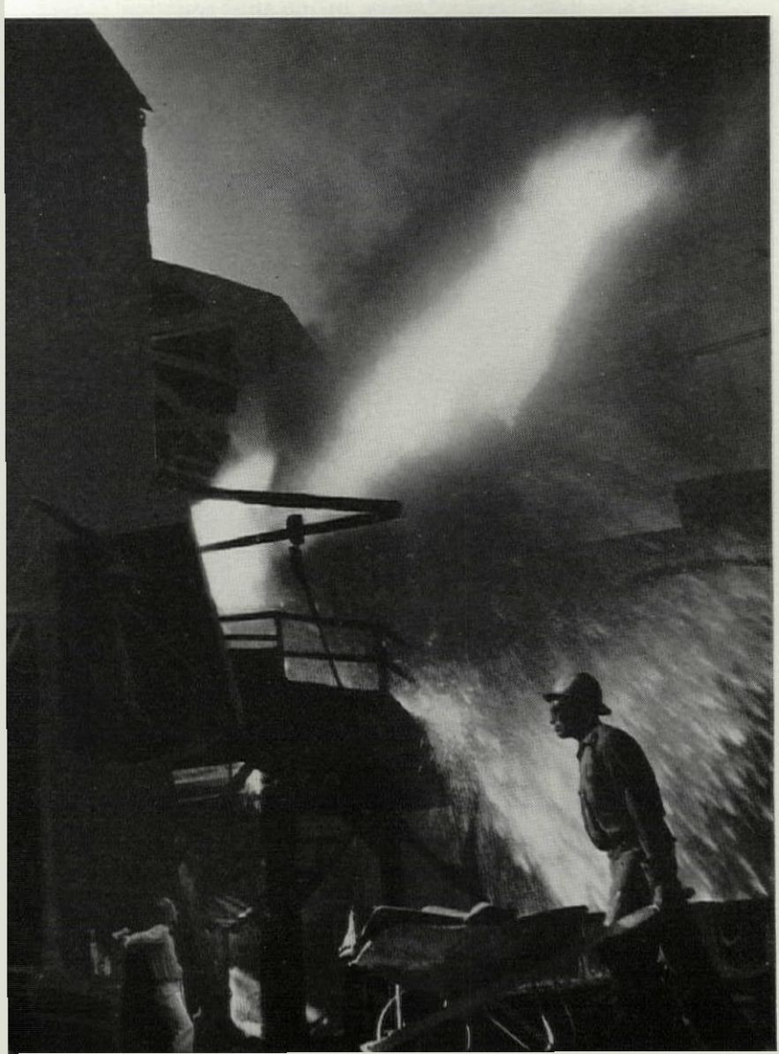
ing out the Atomic Energy Commission work. Ray Giffels supervises all contracts undertaken by this office, which faces not only unprecedented engineering problems but a special personnel problem as well: the staff cannot be expanded to meet any emergency (it takes months to get employees passed by an exhaustive security examination). Usually working on a 12-hour day, the AEC planning staff is headed by Charles Steigleder, chief engineer; Carl Giffels (another brother), chief structural engineer; William Rausch, chief mechanical engineer; Neil Bjornsen, chief electrical engineer.

A year ago G & V opened a third production office in Windsor, now working on a number of Canadian factories including an assembly plant for Ford of Canada. Last fall a fourth production office was opened in Houston with the initial job of designing chemical plants for Dow.

This listing conveys only the skeleton of a mechanism that hums with an operating efficiency rivaling that of any of its famous customers. One small but effective part of this hum is the electrically amplified voice of the switchboard operator. Top personnel can seldom be found sitting behind a desk, so incoming calls are announced in all the conference and drafting rooms, in any one of which a tight little knot of specialists can be discovered jointly wrestling some scheme to a conclusion. This simple device means that any client can count on getting any member of the high ambulatory staff on the phone instantly.

Another symbol of the G & V method is the time clock. President Vic Vallet and secretary-treasurer Ray Giffels are literally the only two men in this vast firm who do not punch the time clock. The time clock is the basis of an accounting system, run with pin-point accuracy for the last 25 years by Mrs. Mary Averill and designed to show any client at a moment's notice the exact number of man-hours expended on his job. G & V is enough in the mold of its auto customers to see to it that its vast staff gives almost the same machine-like performance as the time-clock itself. (Female stenographers, for instance, have never been employed in the main office. Young men, it is believed, not only can take shorthand, but also more interest in their work.)

"They had the shine of steel in their eyes"



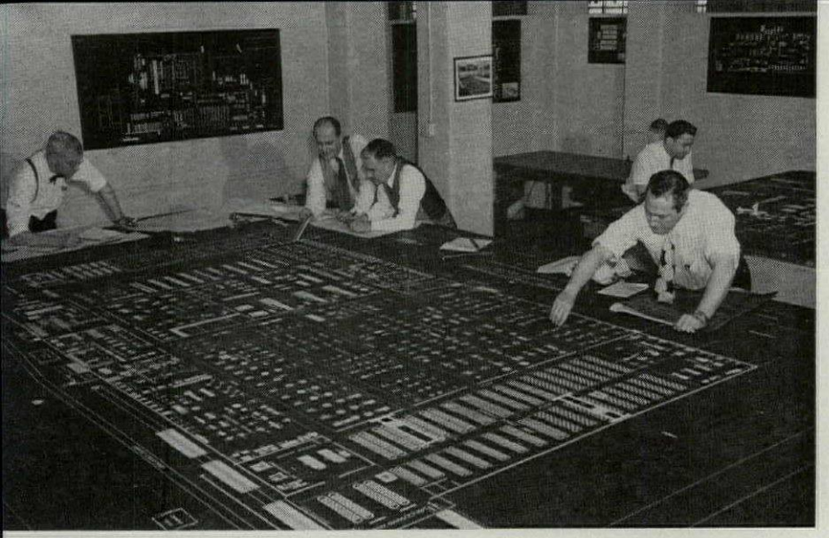
W. Eugene Smith

From the hammer and trowel end

Professional fees are computed in a number of ways, but the time clock record of man-hours expended is basic to all of them. Some clients (Ford is one) are quoted an hourly rate and guaranteed no change in rate for six months. (Actual take-home pay of top engineers may be several times the maximum hourly rate charged clients. Earnings of all employees are supplemented by a profit sharing plan.) Preliminary work is often done on a cost plus or hourly rate basis; then, when the problem is solved and the extent of the work known, working drawings are made on a percentage of construction cost basis.

Vic Vallet likes designers who have the muck of the building site on their shoes. Few men have reached top jobs in the firm without a background in field supervision; many of them (thanks to the depression winnowing of building professionals) have been on the hammer & trowel, or screw driver & pliers end of the building components they are now designing. It is partly Vallet's insistence on practical experience that keeps a large steel detailing section in the office (on behalf of the fabricators G & V detailed all steel work for the UN building). All structural engineers hired fresh out of college start in this department. "Men without this experience never become as good practical designers," Vallet says. This section is also useful to service industries like Ford, who have their own steel fabricating shops, and to provide a place where men can be shifted and kept busy if design work is short.

All this vast and intricate machinery is brought to bear on any single industrial project through a group of men known as project directors. By professional training, most of these men are structural engineers; most of them have spent enough time in and around the steel industry never to get the shine of steel out of their eyes. Each project director has moved on to de-



LAYOUT DEPARTMENT *under Roland Smith (second from l.) gives expert service to the thousands of smaller manufacturers who do not maintain their own plant layout staffs, does special jobs even for the big ones who do. Says Smith: "Manufacturers who aren't making a profit come to us for a reorganization of production that will get them back into competition."*

velop an intimate knowledge of the industry in which he is a specialist.

This operating know-how enables the project director to represent the client in the fullest sense as he pushes the planning project through G & V's specialized departments. It is, as the weary divisional chiefs sometimes sigh, like having the owner right inside the office.

The project director system is the keystone of G & V's view of the professional responsibilities of a design firm. G & V do not view with enthusiasm the development of the "package" firms, which offer building as well as design services. Says project director Bert Giffels: "The designer of a job has a moral obligation to protect the client's interest, not only in the design but in construction supervision. The contractor naturally wants to make a profit. When design and construction resposibility is merged in the same firm, who is there to protect the owner's interest?"

Protecting the owner's interest may, on occasion, go so far as to mean protecting the owner from himself. While G & V's official motto is, "The customer is always right," the firm, like any serious professional, has met more than once the client who needs to be saved from himself. How far should the building professional go in sidetracking an owner's enthusiasm for some device or method (an enthusiasm frequently based, as professionals like to point out, on some hasty night work with the trade magazines) which may have worked brilliantly in 99 other cases but which for some reason will not work in his? The emphatic answer at G & V is—very far indeed! One G & V engineer said: "It is the professional's responsibility, not merely to complacently advise the owner not to do it—but to make clear to the owner, by every means at his disposal, why the solution he proposes will not meet his own purposes. If you are not emphatic enough and the client goes ahead, he will hold it against you later."

Another tip from G & V engineers: at the big building conference tables, where dozens of men are making the decisions that shape your building plans, don't pay too much attention to the argumentative man who does all the talking. He is most probably the head of the owner's building department. But keep your eye on the quiet man who sits next to him, never opening his mouth but jotting down a figure now and then. This is the owner. When you have his attention (the open road to it: "this way of making the installation will save you $16,000"), you have sold your plan.

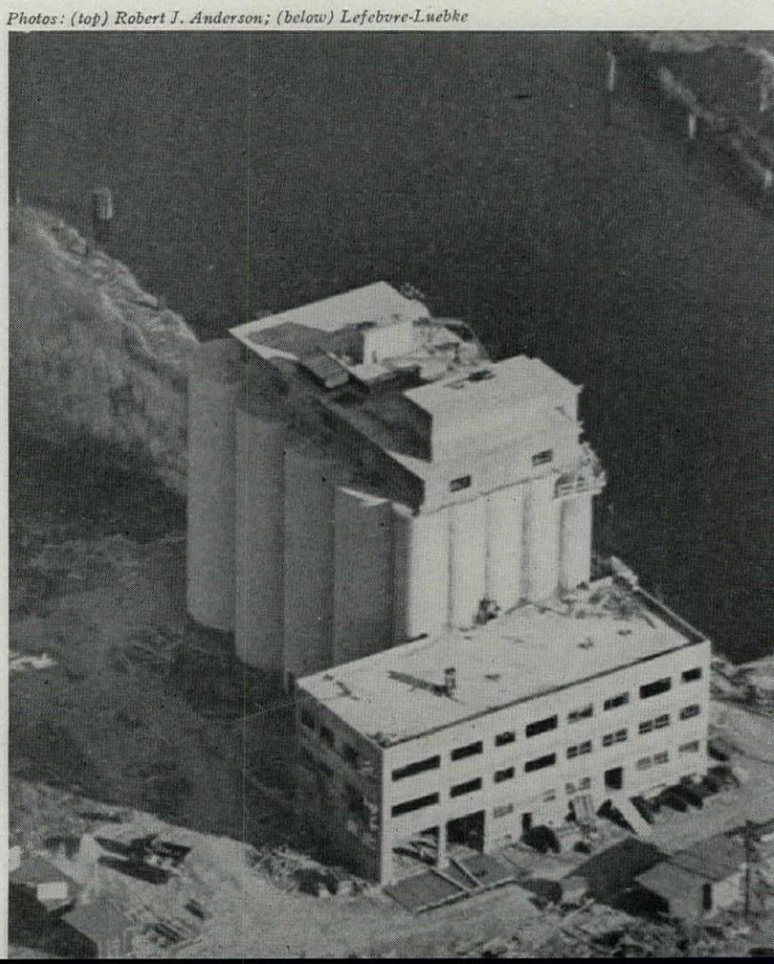
G & V's huge industrial engineering division is scarcely paralleled in the design profession. The resources of this division make it possible for the firm to offer the manufacturer a "turn-key" job if he wants it. Division chief Jones describes the turn key job this way:

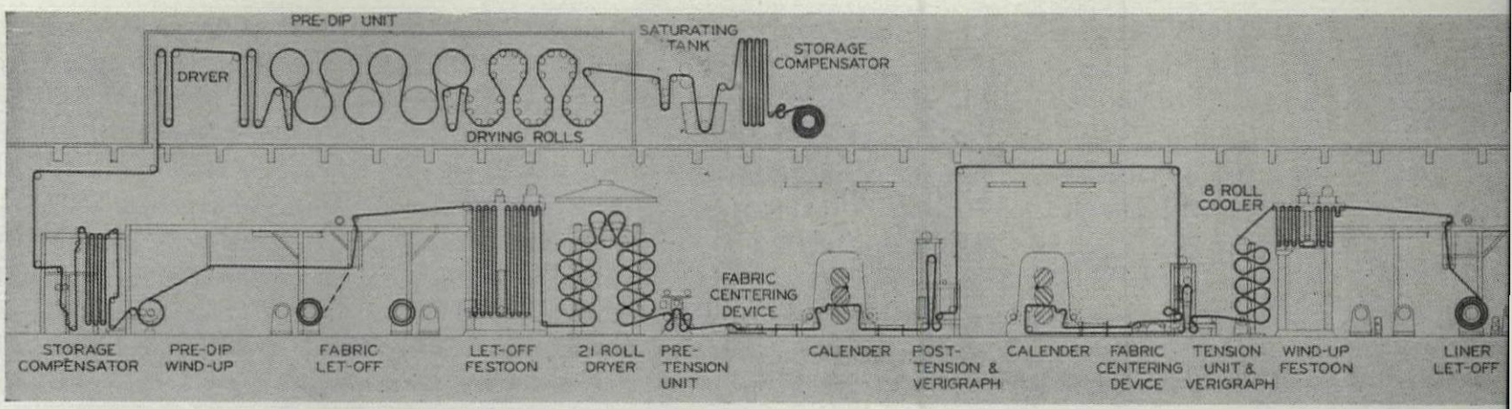
"The customer tells us what he wants to make and how much. We take over from there, designing layout, and (where necessary) machinery and handling equipment, the installation of this equipment, and, finally, the building itself. We supervise the installation of equipment and hand him a key at the end of the job."

Manufacturers who want to install revolutionary process methods find in this division engineers who can visualize these untried methods and find ways to get them built. The foundry work, which accounts for more of the firm's volume than any other kind of building, is full of examples of this kind. G & V engineers started out in the incredible Ford foundry, the world's largest production foundry and the only one where molten blast furnace iron is poured directly into automatic castings. They have been at work inside this foundry

(continued on page 152)

Photos: (top) Robert J. Anderson; (below) Lefebvre-Luebke



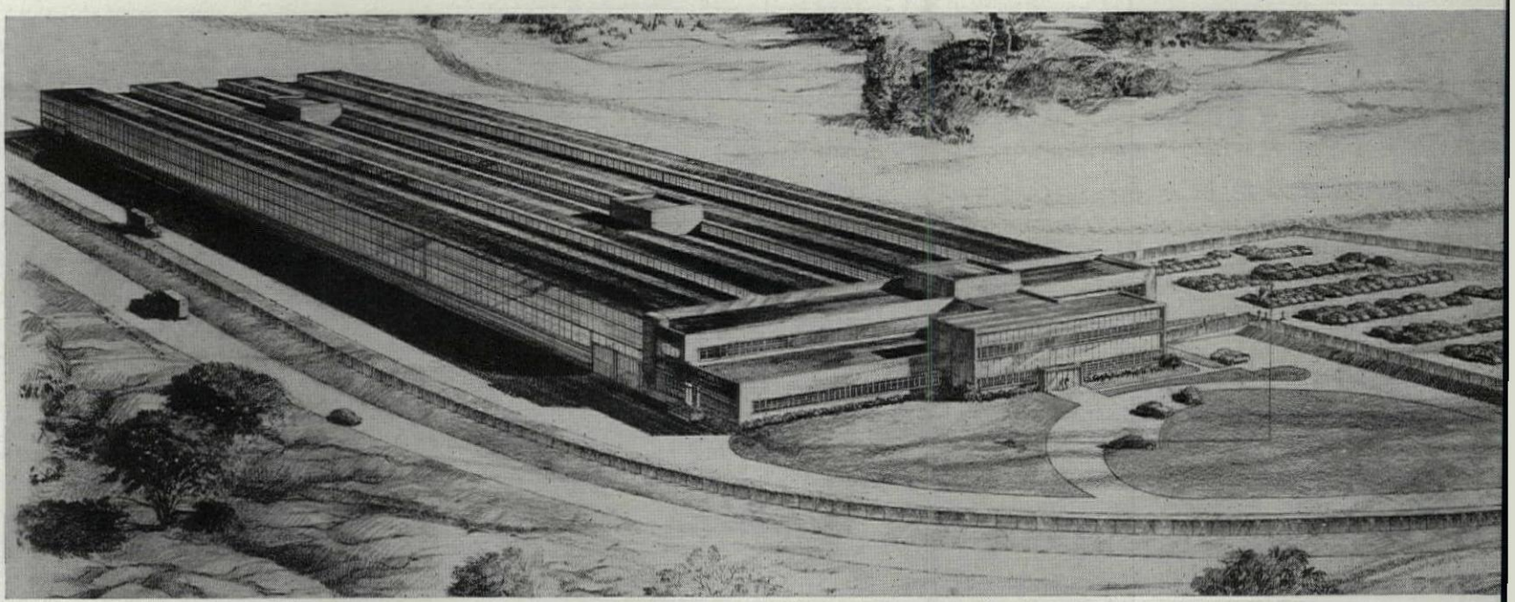


TIRES COST LESS *and tire plants have a new shape because of the calendar train illustrated above. The calendar train provides a continuous method of applying the rubber coating to the textile cords used for automobile tires. Calendar arrangements were developed by various tire manufacturers over a period of many years, but about seven years ago, the Farrel-Birmingham Co., which makes machinery for both the rubber and steel industries, consolidated the various schemes used by tire manufacturers into a coordinated arrangement for the continuous production of coated tire fabrics, known today as the calendar train. Farrel-Birmingham asked G & V, with whom it had long worked on the installation of process machinery, to undertake the detailed development and first installation of the continuous calendar train.*

Electrical synchronization made it possible to run this train continuously like a steel rolling mill, while let-off festoons were designed to provide a bank to permit splicing without stopping. Wind-up festoons were designed to permit cutting of coated fabric while changing rolls at the wind-up. The drawing above shows how the original design provided for coating cord first on one side and then on another. In the most recent design, just installed for the Goodyear Tire & Rubber Co., the calendar rolls are arranged in Z-shape so that the cords can be coated on both sides at once.

Before the development of this continuous train only a few years ago, most tire plants coiled and uncoiled the rolls of cord three or four times, trundled the rolls from place to place to complete the coating process. By making it possible to run cord through all steps without re-winding, the train greatly increased tire output.

Before the calendar train, coating processes were usually spread over a large area on several floor levels. As a result of the train's concentration of equipment and the higher production obtained, less factory floor space is required and the installation is usually made all on one floor.



AIR SLIDE CONVEYOR *invented by the Huron Cement Co. made possible an entirely new layout pattern for the new Huron plant at Green Bay, Wis. This sloping slide conveyor has a fabric bottom, and air under pressure filters through this fabric keeping the cement fluid and gradually flowing it down the slide. Because this conveyor can go around corners and requires no drives, a more efficient layout was possible. G & V helped Huron to take advantage of its conveyor development by assisting in the design of plant layout, structural foundations, equipment installations and concrete shell.*

ECONOMIC DEFENSE PLANT *for the Wheland Co., north of Chattanooga, Tenn., is a sample of the kind of fast-building plants G & V are now designing for direct military purposes. The Wheland Co.'s present plant is downtown; this move out to a 40-acre country site is a decentralization step accelerated by military security considerations. Another provision against the future is flexibility in employee facilities. The plant will start off with a maximum number of men employees, but easily movable partitions in locker and toilet rooms will provide for probable future employment of a greater percentage of women workers.*

A two-story administrative section at the front of the plant is evidence of the trend toward more office space in connection with plant buildings. In some industries, G & V men say, today's more complex accounting and sales procedures mean that there is one office employee for every plant employee.

for the last 25 years, and the newest complete overhauling is underway now. During the war, G & V built Ford's big steel, magnesium and aluminum foundries —and foundries of one kind or another for almost every major manufacturer in the country, including a huge one for Columbia Steel in California, where the sterns of big ships were cast as a single piece of steel.

G & V are also at work converting the Ford war-built steel foundry to some revolutionary new casting processes, which promise to make many of the metal things we use even cheaper than they are already. In one of the new processes Ford has developed, thin shell molds made of resin-bonded sand will be used to produce valves and camshafts for both V-8 and 6-cylinder engines. This new process produces smooth-finished castings to close tolerance (1/3,000 of 1″), which require little cleaning or machining. The other experimental Ford process, which promises even more far-reaching results, is the development of nodular iron for crankshaft casting. Nodular iron (made by a break-up of the free carbon deposits) produces a low cost casting which is as nonbrittle and machinable as malleable iron, but requires no expensive heat treats, etc.

Will the building work?

What does all this mean to the design of a building? The rhetorical answer is: a great deal more than many an architect might assume at a glance. As G & V engineers marched step by step with manufacturers' engineers in getting these new processes to work, they very soon learned as Ray Giffels says, "that a foundry is more than electric furnaces, cupolas, shake-outs, etc. It is also a building, and whether the building works determines more than anything else how well these expensive pieces of equipment will work."

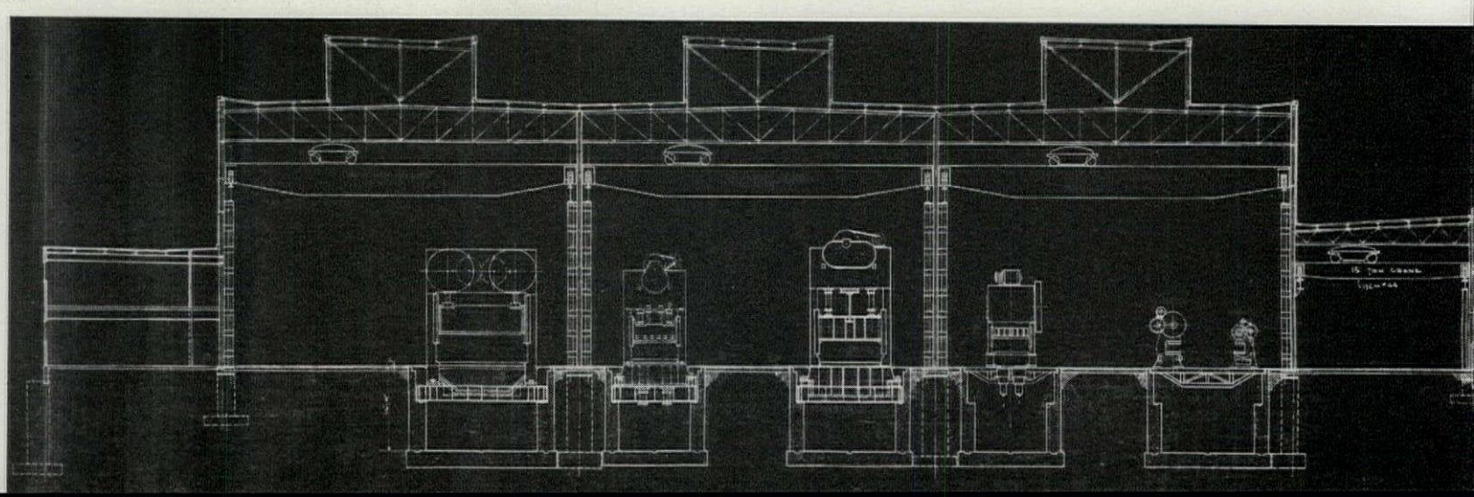
In a foundry, this ranges from the simple necessity of developing building height over melting furnaces as a stack to carry away fumes to the more complex requirement of providing an air supply clean enough to persuade a steadily diminishing supply of foundry labor to go on working at a process involving unpleasant amounts of sand, fumes and heat.

Every one of G & V's divisions went to work on designing the plant which the Budd Co. built two years ago at Gary, Ind. The miracle of this job is that exactly seven months elapsed between the day Budd outlined the kind of plant it needed to Oscar Pocock and the day Budd started stamping out metal in the finished 300,000 sq. ft. plant. Within that seven-month period, G & V 1) designed the building, building services, plant layout and the installation of about 1,000 pieces of equipment; 2) received all bids and made recommendations for contract awards; 3) purchased, expedited and scheduled delivery of all materials; 4) supervised construction and installation of machines.

The full impact of this kind of speed can be better understood in the light of a few facts about the design of the plant, which included 1) a comprehensive plan for three possible future expansions; 2) a careful disposition of rail, truck and parking access to allow for these future building additions; 3) a careful study of where to locate the power house and electrical equipment for economic service of the buildings which might follow; 4) a completely flexible system of installing presses, permitting easy shifting of these giant machines for future production changes (see drawing, below).

All this was carried out on a site in the Gary sand dunes not far from where the government had abandoned a war plant building job after losing a battle with the sand. G & V held the fine dune sand down by planting a cover crop (a mixture of legumes and other nonthirsty shrubs developed for them by Wilcox & Laird, landscape gardeners) over the whole site. This solved the sand problem except for one tornado which blew out a large amount of glass and buried the job 2′ deep. As soon as one end of the plant building was housed in, the contract for equipment installation was awarded, and this work was woven in with the work of all the other trades on the job.

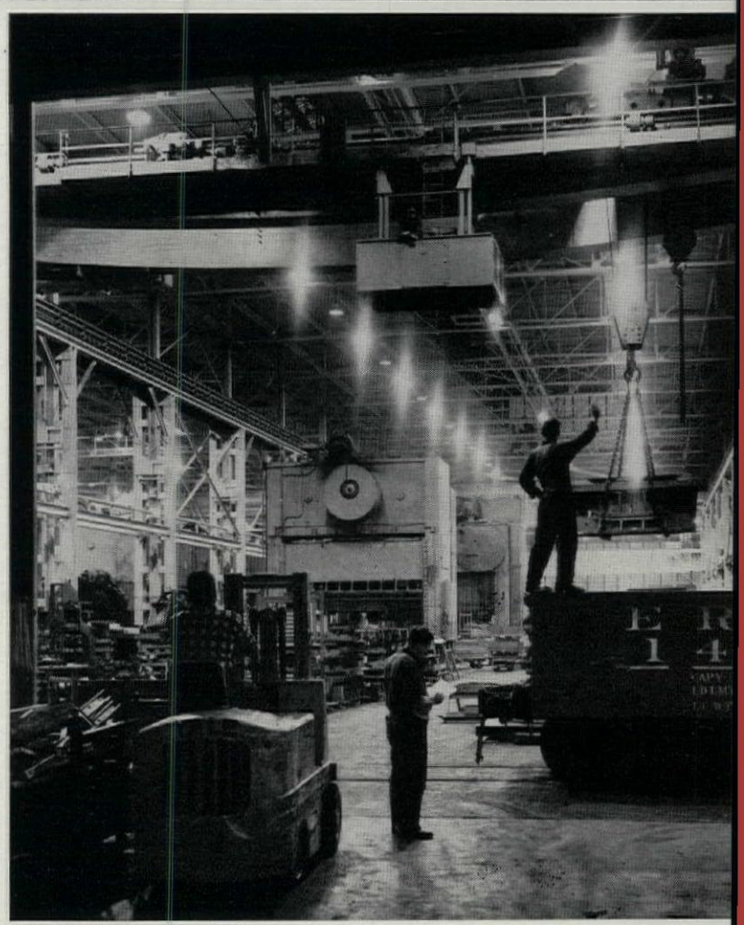
It is jobs like this that bring a snap to the eyes of G & V men. There isn't much time for reminiscence in the 12-hour day, 6- or 7-day week most of them are working right now. But, once in a while, as the work mounts to a scarcely endurable pace, some veteran staffer is apt to say grimly: "Well, we helped build the plants that won the last war. I reckon we can do it again."





FLEXIBLE PRESS ROOM *is provided by three 150′ long press pits as shown in section on opposite page. Beams supporting heavy presses ride on a ledge on each side of this pit. A series of standardized removable covers span the width of the pit between presses. These can be easily removed, and the press moved piece by piece down the line whenever necessary by 50-ton overhead cranes. The press pit also gives easy access to presses for repair. Because Budd makes steel auto roofs and doors in this plant, press flexibility was important for easy adjustment to model changes. G & V think most plants need to provide the same flexibility for press room changes.*

The basic plan for this plant foresaw possible future expansion in three separate stages. The section built is 1,091′ x 280′. There is a 35′ wide service bay on the west side, running at present half the length of the plant. In the next building step, this service bay would be extended the full length and another manufacturing area equal to the size of the first would be added. Other expansions would be added in the same sandwich fashion. The present service bay has two floors, with locker and lunch rooms, etc. below, transformer rooms centralized above. This puts transformers in a good place for servicing the next building addition.



Photos: (top and below) Hedrich-Blessing; (center) Lens-Art



ECONOMIC VENTILATING system uses perimeter heaters to offset wintertime wall loss

This new Lincoln-Mercury assembly plant now being built for the Ford Motor Co. at Wayne, Mich. is worth study for 1) some safeguards against possible atomic bombing; 2) a carefully studied plant-wide ventilating system; 3) some innovations in handling the troublesome painting operation. Ford made its own layout; G & V were responsible for the design of the building and all services.

For protection against blast, poured concrete (as less shatterable) has been used instead of brick, and the sill wall has been raised to 8 ft. Sash, however, has been held to the usual height of 5′ 5″, with insulated aluminum siding used above. Six transformer stations have been moved from the roof to a less vulnerable position at the sides of the plant.

In the 1,341,500 sq. ft. plant interior, wintertime heat loss through exterior wall and doors is taken care of by perimeter heating (unit heaters). Thus the ventilation air supply for the entire building can be handled at ventilating temperatures, rather than by using booster heaters for the extra heat loss of the exterior bays. Ventilating is by penthouse fan rigs, see diagrams, opposite.

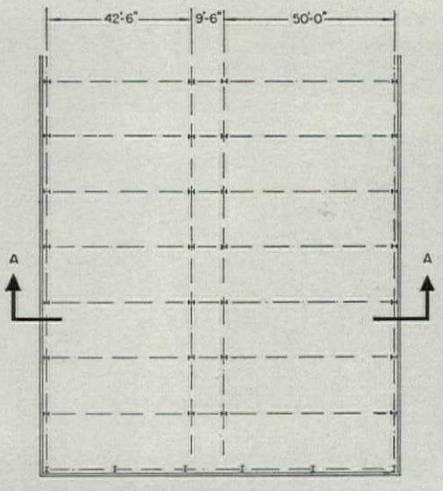
Wintertime air supply is 25% fresh and 75% return air. In summertime, air supply is 100% fresh, with exhaust through power roof ventilators having a total capacity equal to the supply system.

In the offices, complete air conditioning is provided and the system is designed to permit flexibility in office partitioning on a 4′ module. Winter heating is by hot water convector radiators in each module to handle 75% of the wall heat loss.

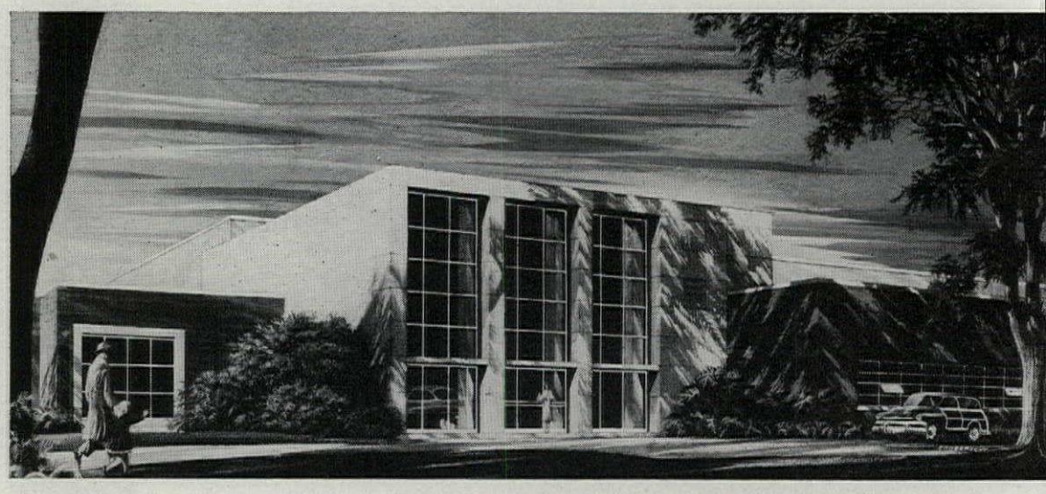
The balance of the heat required in these exterior modules is supplied by the interior zone ventilating system. Both hot and cold air are carried to exterior zones through a double duct system with a double mixing damper for each branch.

In inside zones, where cooling is needed summer and winter —even when the outside temperature is 20°—a single duct system is used. This is controlled by several thermostats which, through a relay, average the conditions in the large space.

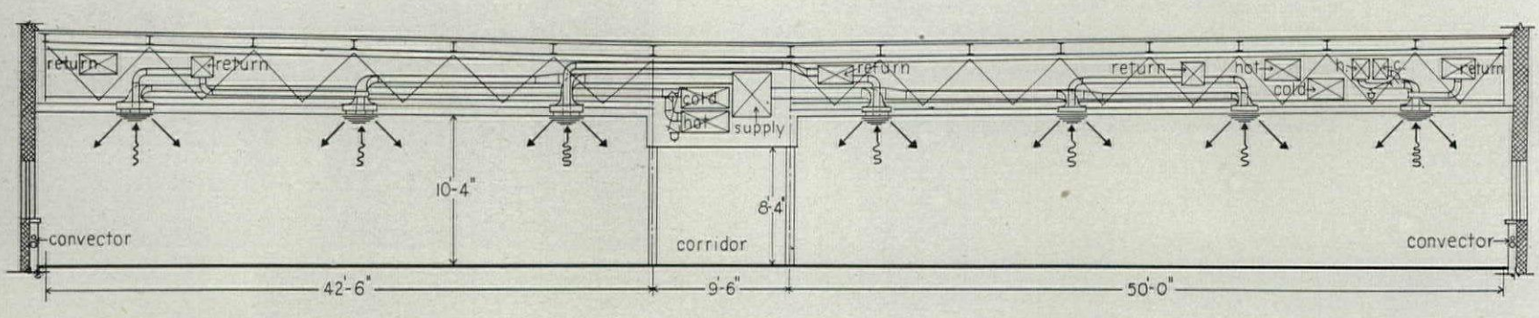
In this plant, Lincoln-Mercury decided to centralize its paint mixing operations in a separate building. Paints are pumped in through a tunnel to spray booths grouped for better handling of wash water. From each group of booths used wash water is carried by high velocity flumes to settling tanks where the overspray paint is removed by a mechanical conveyor. Water is then pumped back to the booths for re-use. This system reduces booth cleaning from once a week to once every three months.



PLAN OF OFFICE WING

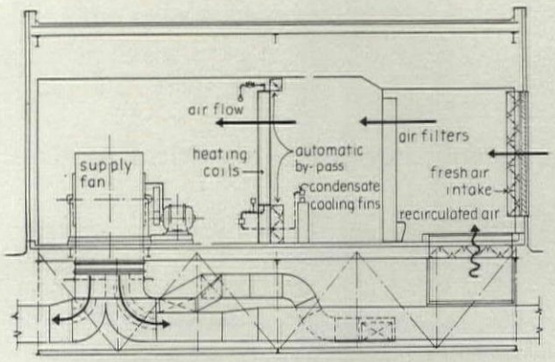


ENTRANCE TO OFFICE SECTION

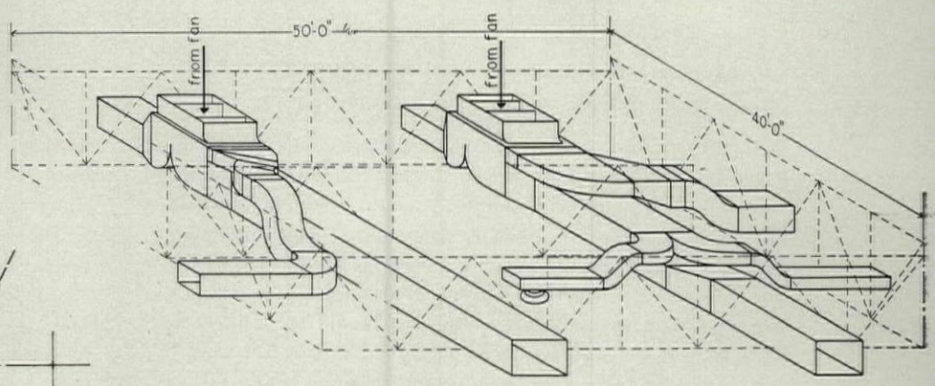


CROSS SECTION OF OFFICE WING

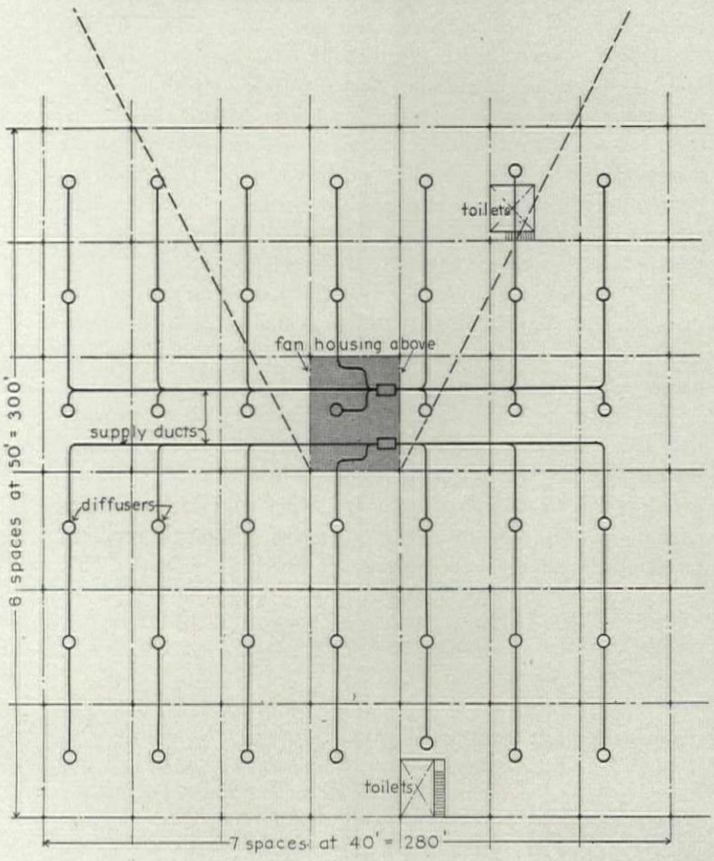
FULL AIR CONDITIONING *in offices is provided as shown in cross section, above. Double duct system carries both hot and cold air to exterior zones. Mixing damper for each branch is equipped with a pneumatic motor permitting thermostatic control singly or in groups according to the partitioning of the office or space to be controlled. Note single duct system used in interior zones.*



SECTION SHOWING HOUSING OF FAN RIG

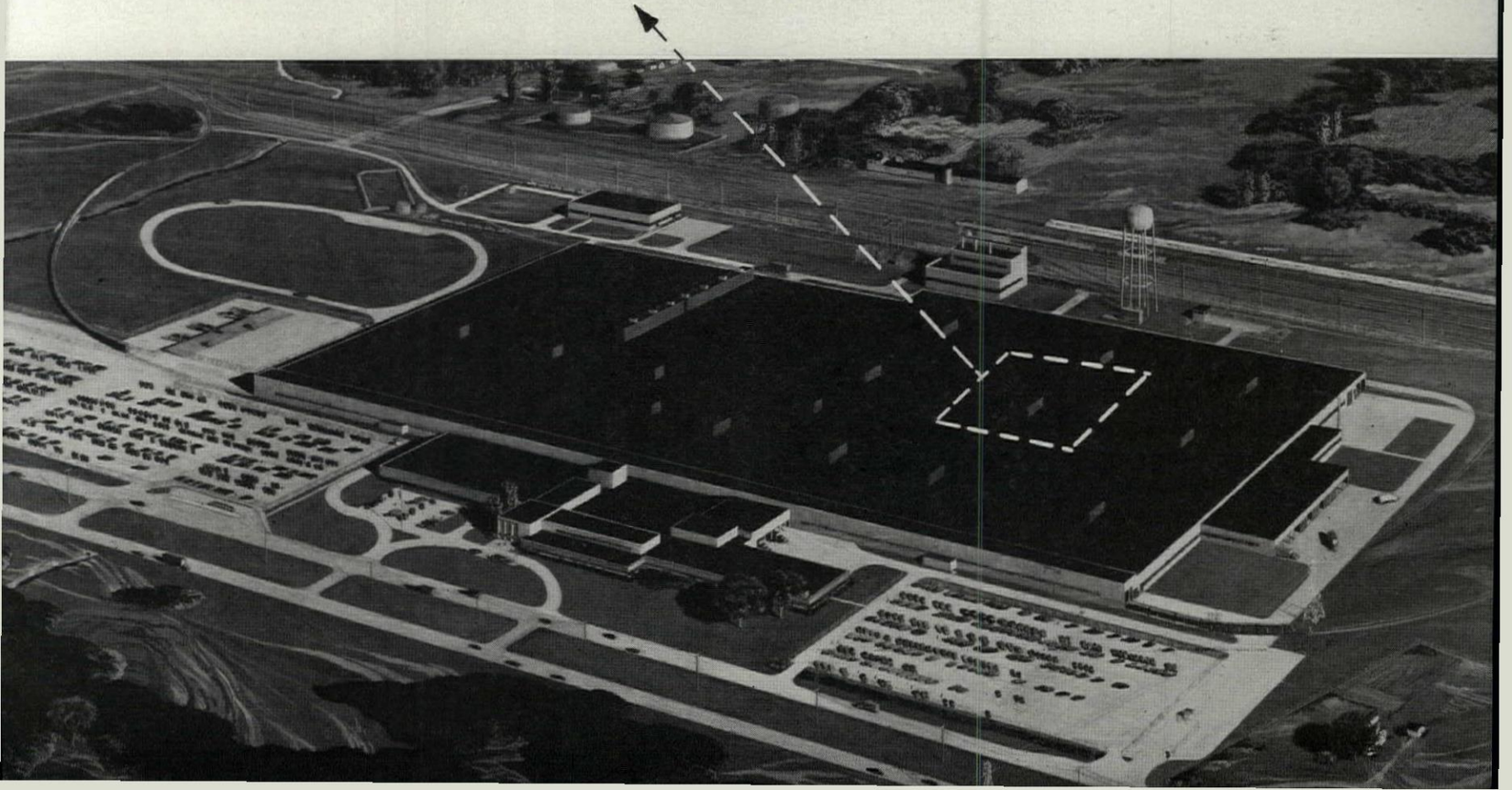


DETAIL OF MAIN DUCTS UNDER FAN RIG



VENTILATING *is by penthouse fan rigs (usually two rigs per penthouse). Each rig consists of fresh air and recirculated air dampers, continuous oil curtain air filters, heating coils and fan. All steam coils operate at 30 psi. One master thermostat per fan rig controls through a duct type submaster thermostat the heating coils of each rig.*

There is one air diffuser per bay (50 x 40 ft.) mounted with the bottom at the bottom chord of the truss (18'). Each diffuser supplies 3,750 cfm. The system provides approximately five air changes per hour. Diffusers are set to deliver air straight down in summer but, to guard against winter drafts, are adjusted to deliver air at an angle below the horizontal plane. (Supplementary ventilating was, of course, designed for special process areas such as painting, body seam soldering, etc.)



FLEXIBLE OFFICES:

baseboard raceway used to give easier access for changes in electrical services

This handsome office building for Dearborn Motors Corp.*, Birmingham, Mich. shows some intensive development of electrical and mechanical services to permit the flexibility in office arrangment demanded by modern business methods. Most office interiors are today designed like this one to a basic module according to which easily movable partitions are installed. Relocating these partitions to divide space into large or smaller units as needed is a simple process. But the layout of building services to agree is more complex, since heating and ventilating outlets and controls, area lighting and switches, telephones, office signal systems, and 110-volt power supply for desk lamps and office machines must be provided to fit the new space arrangement.

G & V's electrical staff worked out a baseboard raceway installation to supplant the usual built-in floor box access to header ducts. Transverse wiring is carried through the cellular steel floor. In one baseboard, they installed 110 voltage wiring for intercoms, office machines, etc. In the other baseboard, they installed telephone conduit and a low voltage circuit for switching the overhead lighting fixtures. With a low voltage circuit available the length of the baseboard, switches can be installed at any needed point to agree with partition changes. The circuit used here operates with less than 50 volts. This kind of low voltage switching circuit has heretofore been considered feasible only for household lighting; a G & V engineer redesigned a relay unit to adapt it for use with high intensity lighting.

The engineers responsible for this electrical installation believe baseboard raceway access has many advantages over the usual floor boxes. They claim that the labor time required for making electrical changes is reduced to one-sixth that needed to make connections through the usual floor boxes. They figure that, for an average installation, first cost amounts to several thousand dollars less than the floor box system. They mention these other pluses: better-looking floor, no danger of water damage to wiring when floor is washed, no possibility of covering up floor box outlets when partitions are changed.

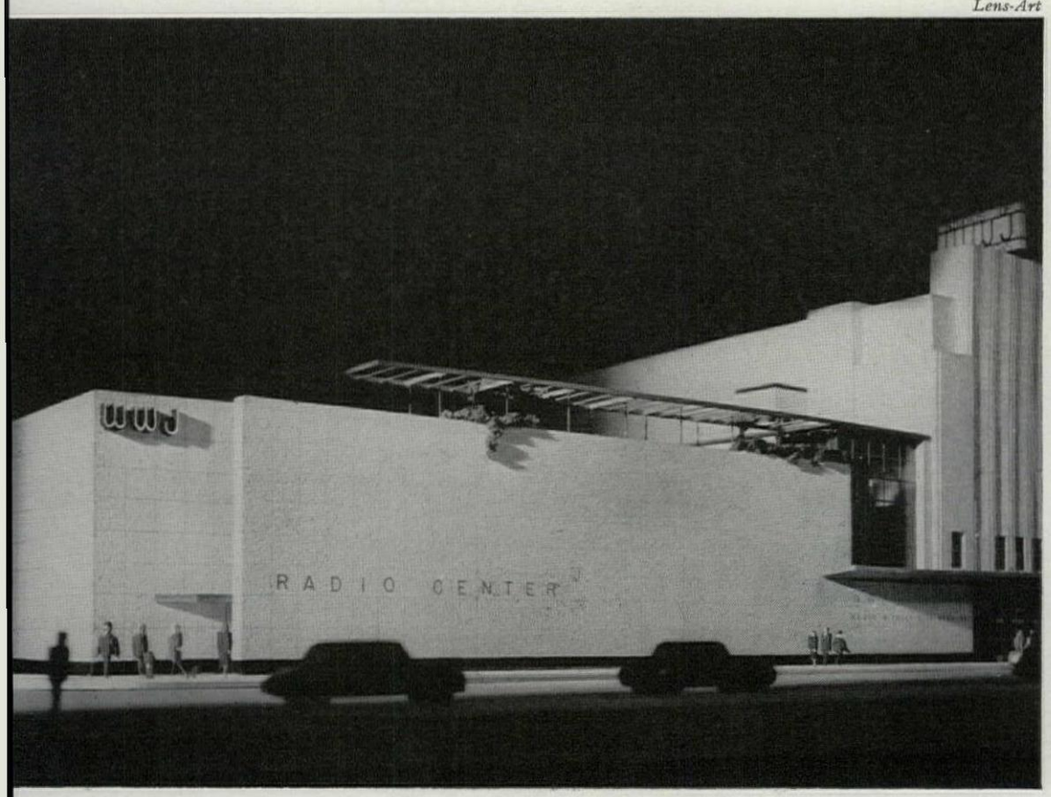
The ventilating system (central hot and cold air supply through many small diffusers, supplemented by perimeter heating) is similar to that used in the Lincoln-Mercury offices and presented in detail on p. 154.

The scope of G & V's electrical engineering division means that this interesting study was only one of hundreds of jobs underway over the last year or so. While this office wiring problem was on one drawing board, other engineers were, for example, working on the complex electrical controls required to install the newest model of the calendar train shown on 151.

* National marketing organization for the Ford tractor and Dearborn farm organization.

TELEVISION STUDIO BUILDING

Lens-Art

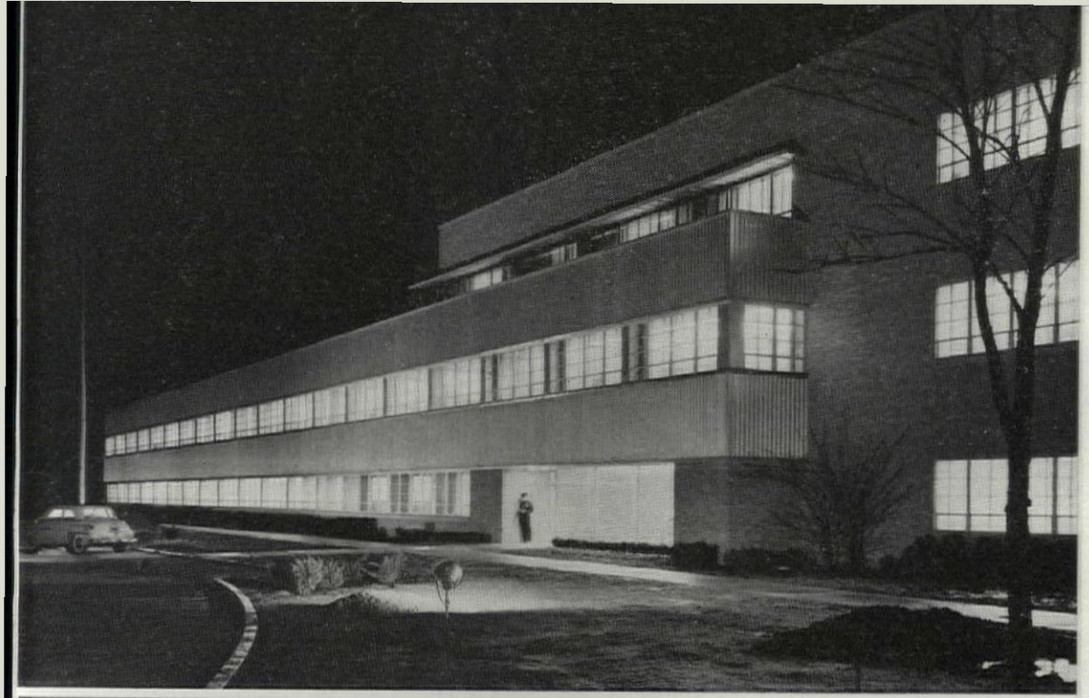


This new television building for WWJ-TV, the Detroit News, *has been completely designed around a highly demanding electrical installation. The building will contain about 60 miles of wire, not counting telephone and light circuits. Since the technology of television is still rapidly developing, wiring is designed not only for the present heavy electrical load (about twice that of an office building) but to provide for future changes. Cable runs will all be made through open ducts to a central duct shaft running from the basement to the master control room on the second floor. Control rooms for the three large studios will be located directly beneath the master control room so as to concentrate all electronic and electrical circuits. The master control room, "nerve center," of the building, will hold about 90' of relay racks necessary for mounting the various electronic units.*

The structural design provides for raising each control room 6' above the studio floors, to give the producer and director complete visibility. The maze of conduits, piping and camera cables required will be concealed in floor slabs.

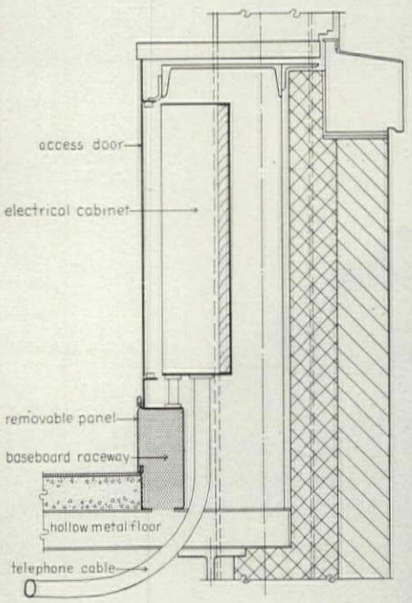
The tremendous heat load of the high lighting intensities necessary in the studios and the heat given off by operating equipment in control rooms required about 150 tons of air refrigerating equipment. Unusually large ducts will provide air supply at velocities low enough to be noiseless.

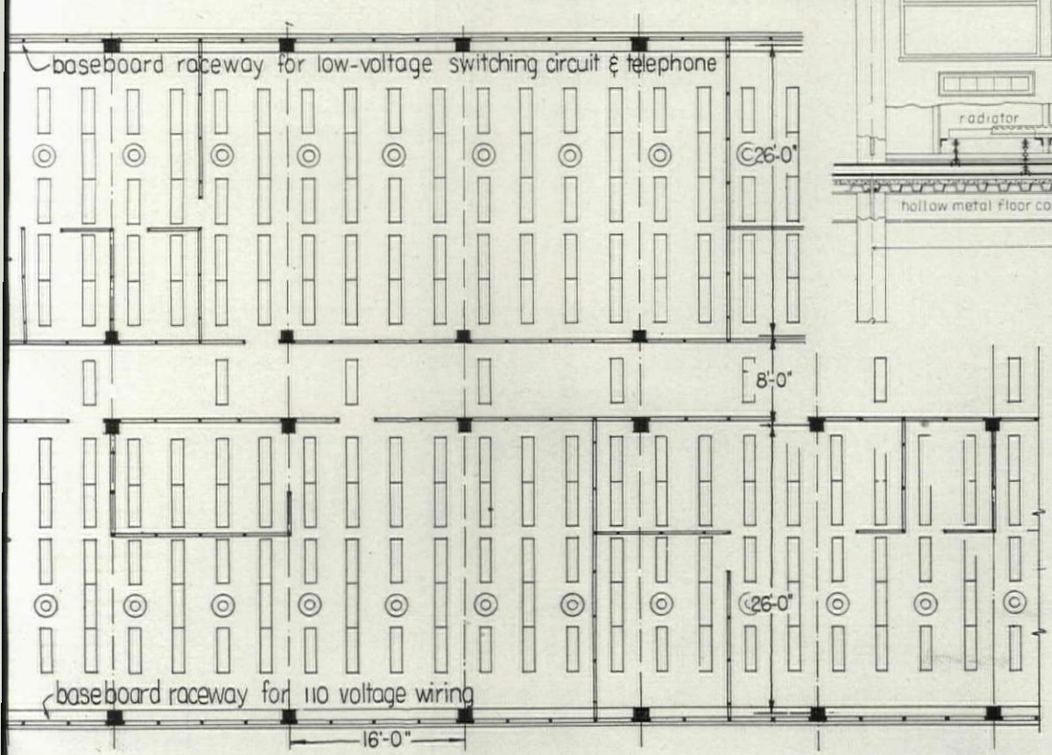
Model photograph (l.) shows how new windowless building is skillfully related by glass section to older building with conventional facade (WWJ radio station).

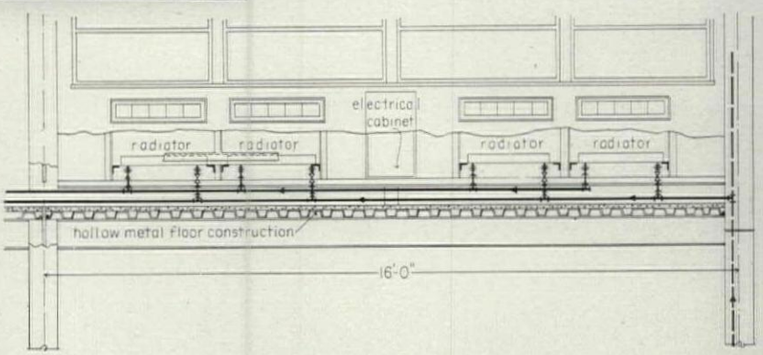




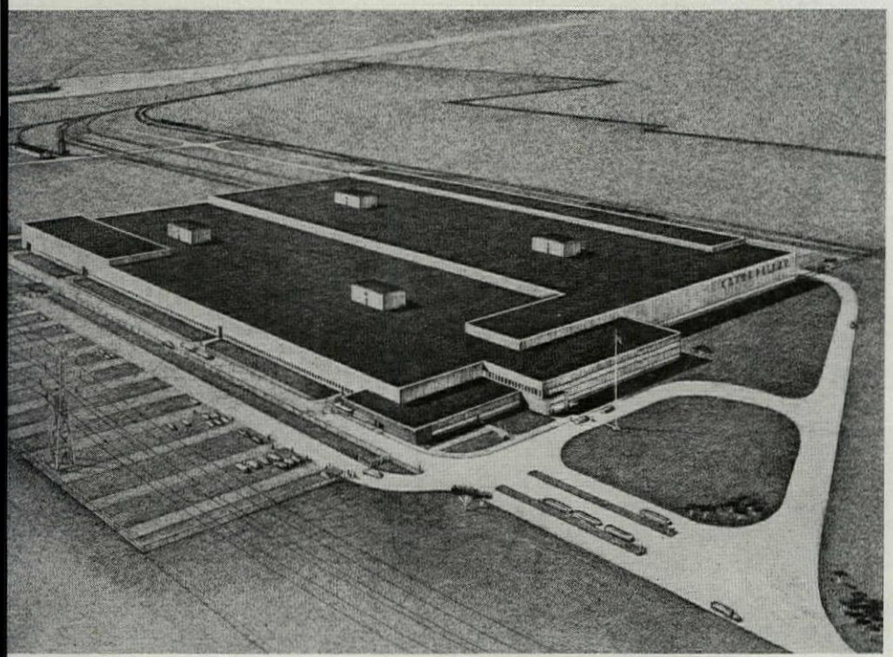
Photos: Lens-Art







ALL THE THREADS *are securely woven into the structural fabric of this office structure, including the threads of communication and wiring. Spandrel section (top) and plan (left) show how these are consolidated in two easily available, but integral raceways in exterior walls. One raceway contains low voltage switching circuit and telephone lines, the other 110 v. wiring. Cross office wiring can be run through hollow metal floor shown in section above.*



STRUCTURAL SAVINGS *was made in the new Joilet plant by step-downs in bay height. The structure lines up according to process like this: first four bays house small parts machines and are 20 ft. high. The next four bays house subassembly and are 28½ ft. high (enough for an overhead crane above the welding fixture); the last bay is 34 ft. high to house final assembly, painting and storage. One transverse aisle (28½ ft. high) runs the width of the building to provide a craneway for moving products from one major section to another.*

EXPANSION PLAN for Caterpillar Tractor required decentralization of one of three new plant buildings

Caterpillar Tractor Co. has been busy on a $50 million G & V-designed expansion program notable for a bold decentralization step and for the final solution of a difficult ventilating problem.

After adding two new buildings with 44 acres of roof to its Peoria plant (photo, below), Caterpillar found it had hit the labor ceiling there. The families of its 25,000 workers added up to 100,000 of the area's 160,000 total population. Housing lack forbade importing additional labor, so Caterpillar decided to build its third new plant (800,000 sq. ft. for scrapers) 100 miles away in Joliet. Although $1½ million had to be spent before the job was above ground because of a difficult site, this plant was built at a total cost of only $11 a sq. ft.

For this plant G & V made a careful study of ventilating requirements for maximum process. Says Bert Giffels: "The cost of heating an adequate air supply sometimes frightens plant owners, but they can save money in the end if they design to maximum load in the beginning. If the ventilating load is increased over capacity after the building is finished, the cost of adding more exhausts and heating units is usually excessive."

The big ventilating load involved the whole mid-section, which had to be treated as one vast welding booth. Here the working floor is drenched with rapid air changes—5 cfm. per sq. ft. Air flows down from intake points in a mushroom pattern to reach exhausts. Each intake (consisting of heating coil and fan installation) serves 6,400 sq. ft. In nonwelding zones, fresh air supply is 1½ cfm. per sq. ft. These systems provide 100% fresh air, with no re-circulation and exhaust tons of dust daily. Heating this air supply requires 60% of total plant steam (including process steam).

The steel frame is designed for future flexibility. Although full span (80 ft.) bridge cranes are now used, the trusses are also designed for underslung loads, making it possible to introduce underslung cranes at any time. Another noteworthy feature is a large outdoor paved storage area. Caterpillar decided that few of its materials need to be stored under roof, so G & V provided a 125 x 2,200 ft. strip of concrete where small parts will be stored on pallets, rubber tires stacked, and all other parts arranged for easy moving by fork-lifts.

Concrete, brick and glass are handled simply in long expanse of wall of Peoria plant.



STEEL FRAME of 22-story laboratory tower designed to minimize vibrations

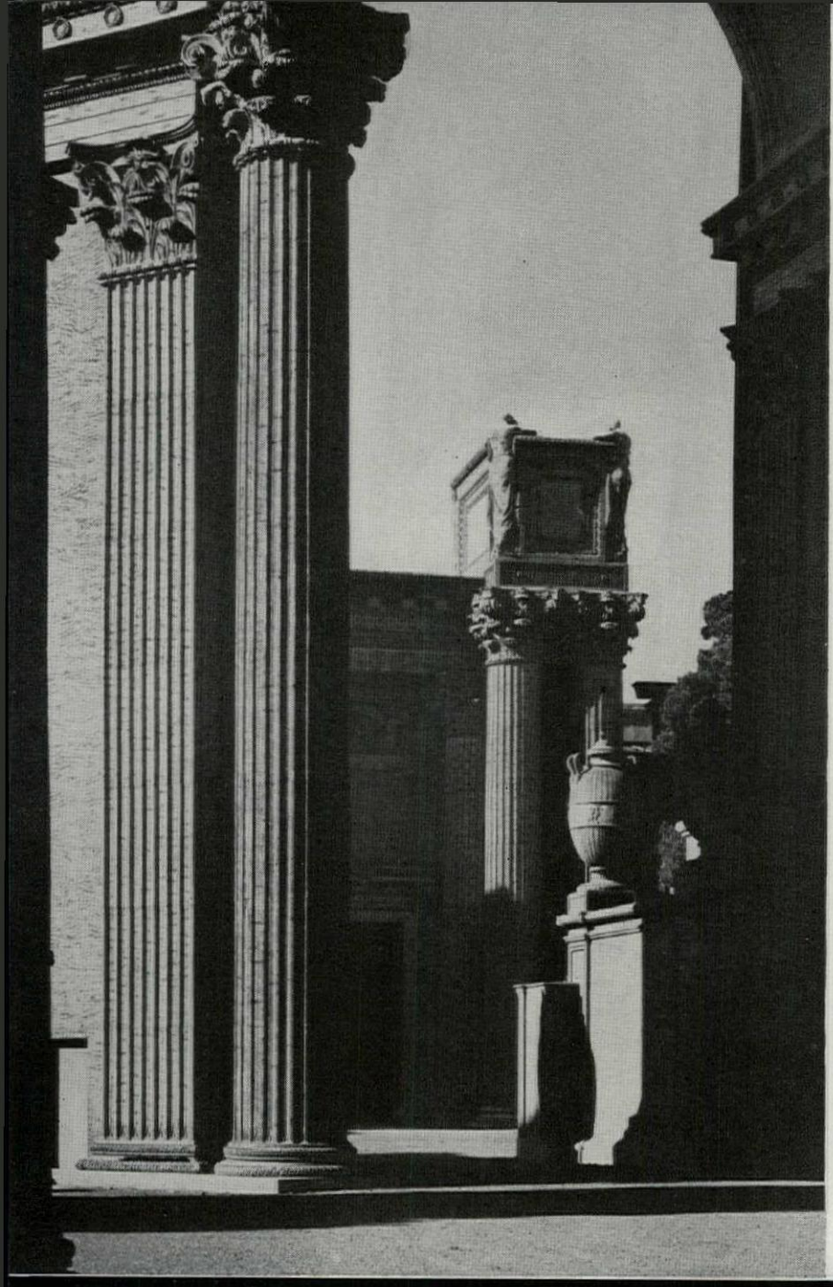
This 304 ft. steel tower in Nutley, N. J. illustrates the happy wedding of G & V architectural skill and engineering know-how. It was built for Federal Telecommunications Laboratories, Inc., a research associate of the International Telephone & Telegraph Corp. Its structural design raised some interesting problems. With 70% of tower weight concentrated in the upper 92′, this top heaviness imposes an uplift of several hundred tons on the foundation during high winds. Consequently, main columns are anchored into a reinforced concrete foundation mat 10′ thick and their uplift loads transferred to reinforced tension cylinders extending down some 30′ further into bedrock, to which they were firmly bonded by expansion concrete.

Only standard rolled shapes were used in the tower frame, including columns and bracing. The tower has an aluminum skin supported by curved braced girts which transmit wind loads to the steel frame. Vertical radar supports are provided between the 16th and 20th floors, serviced by steel walkways.

To keep both static deflection and vibration under 80-mile-an-hour windloads from interfering with laboratory work, allowable wind stress in columns and bracing was calculated for a maximum deflection of 10½″. These calculations, taking into account the unusual weight distribution at the top of the tower and the eccentrically loaded projection on the north-south axis, involved both normal and torsional inertia loads in addition to the wind load.

G & V engineers had to develop new formulas to estimate the effect of periodic wind pressures. The tower's period of oscillation was computed at about 3 seconds, maximum static deflection at about 7 in., amplitude of vibration at about 3½ in. Both these magnitudes are considerably less at the laboratory sections of the tower. As a part of their research, G & V built a small machine, which could be turned with a hand crank, to test the effect of peak vibration on people. Edwards & Hjorth were consulting engineers on the structural design.

Photo by Ezra Stoller for FORTUNE



MAYBECK

THIS year, in conferring its highest award, the American Institute of Architects honors the conscience of the profession.

When Wallen Maybeck accepted the AIA's Gold Medal for his father, Bernard R. Maybeck, the architectural profession bowed not to worldly success but to the symbol of the artist in architecture. It is not so much what Maybeck did, as what he stands for, that is being given recognition. And Maybeck stands for the everlasting supremacy of art.

The corner stone of Maybeck's reputation rests on a single building—the Palace of Fine Arts of the 1915 Panama Pacific Exposition in San Francisco. This building was the medium through which thousands of people experienced the royal, Medieval, Sunday emotions which they had previously associated only with the architecture of far away places and other times. It was not the form but the emotional quality with which Maybeck could charge his simplest structure that distinguished his work.

Created to convey the impression of sadness produced on the mind by the spectacle of grandeur in decay, the Palace of Fine Arts has since become a ruin in its own right and has acquired a sadness of its own. It has become a symbol, not of Rome, but of San Francisco, that

Photos: Lionel T. Berryhill



PALACE OF FINE ARTS
San Francisco

—Medallist *by Jean Murray Bangs*

once proud "port of gold," which seems powerless to give more than a stay of execution to the building which it loves but is impotent to rebuild permanently.

Though the Palace of Fine Arts, conceived as a temporary structure, is still standing, Hearst Hall, one of Maybeck's most characteristic and significant ones, is gone. Hearst Hall was erected in 1899, moved to the campus of the University of California in 1900 and dedicated, "A gift of Phoebe Apperson Hearst to the Women of California," in 1901. It burned in 1922.

Unlike the Palace of Fine Arts, Hearst Hall was untraditional in form. Like the Palace, it was charged with emotion that cannot be conveyed by pictures or words. It was remarkable and prophetic in several ways.

It contained the implications of prefabrication, for the design program called for a structure to be built in sections, so that it could be picked up and moved to a permanent location, after its first temporary use.

Acoustically, it was 30 years ahead of its time. Walls of the main hall were made irregular and sloping, so that the sound waves would not bounce back and forth. Bays and alcoves formed "sound hollows," in imitation of the conditions which produce the beautiful quality of sound in the forest.

The lighting conquered the limitations presented by the technical development of the time. By using 900 naked incandescent bulbs of low intensity, Maybeck produced an effect of "sharp points of light sparkling in a soft atmospheric glow," an effect more subtle than today's frequent light-baths.

Maybeck's experience is one of paradox compounded. His temporary building was reprieved from destruction but a great many of his permanent ones destroyed. And his greatest architectural achievement of all was never built. It was no building but a dream, still on record under the comprehensive title "The International Competition for the Phoebe Apperson Architectural Plan for the University of California."

Besides building and planning, Maybeck taught. He is the founder and was the first head of the Department of Architecture at the University of California. When not teaching architectural classes at the university, he conducted them Saturdays, at home. This brought his time as teacher, not counting early night classes at the Mechanics Institute in San Francisco, to seven years. His first students were picked up from among draftsmen in the offices in which he had worked in San Francisco,

FIRST CHURCH OF CHRIST, SCIENTIST, Berkeley, Calif., 1910-1912
—"a gilded, painted, gray-and-golden, blue-and-silver glory of Byzantine and Gothic elements that makes the heart sing to look at it"
—Frank Morton Todd

Minor White



from among his students at the university, and among chance acquaintances made on the ferry to Berkeley. How far away all this seems, but we do not have to pity those boys!

Maybeck was a teacher who did not paralyze others with the power of his personality but helped them develop the power of their own. He gave his students an appreciation of beauty, a sense of its importance, and the desire to bring it into the community. He encouraged them until they were able to think on a big scale. After that he taught them how to work. Each was enabled to realize his full capacity—the dream in his mind. As a result, a surprising number of them were able to rise to the top of the professional heap—to secure the confidence of the leaders in the community—to get big work.



FIRST CHURCH OF CHRIST, Berkeley, Calif.

Maybeck had the ability to instill enthusiasm into his boys and power into their work. He turned out some masterful men —John Bakewell, Harvey Wiley Corbett, Albert Landsburgh, Edward H. Bennet, William G. Merchant, Lewis Hobart, Loring Riseford, Herbert van Vlack and Arthur Brown. He encouraged his students to go on to the *Ecole des Beaux Arts* in Paris and a surprising number of them did. Julia Morgan, the first woman architect to be admitted to the Ecole, started her career drawing under Maybeck's supervision. Later he helped her break into the Ecole.

All his life, Maybeck has been primarily the artist. Today, at 89, he still wears the beret of his *Beaux Arts* student days. Even in the simplest of his Redwood houses, his work has nothing to do with the Bay Area "carpenter tradition." He has always insisted that architecture was something more than that. He makes this clear in everything he says. He makes it clearer in his work. For example, when he exposes construction, he multiplies the members for effect. Ends of beams project as Gothic dragons. Color and ornament may emphasize structure, or they may not. But in any case, what is basically there is drama.

Consider another example, his use of wood. Big beams are not surfaced but rough sawn. He uses wood as nearly as possible to the way it is found in the tree and lets it age as it does in nature. This shows wood at its woodiest—makes one conscious of its essential character, with new force. Fire is not only heat but a symbol so the fireplace is emphasized, often with an opening as high as a man. (And Maybeck's fireplaces worked.) When he would bring family life into contact with nature, Maybeck had the sense to leave the outdoors out, where it belongs, but he kept his buildings from destroying the natural landscape. Material, color, and form are used with an eye to blending his houses into a natural setting. In creating his own small harmony, he does not destroy nature's larger one.

Every building he designs is always something more than its owner thought it was going to be. If he designs a church, the form of the building must symbolize the creed. Benjamin Franklin once said that it was important not only to be honest but to look honest, so Maybeck, too, makes his buildings express their function emotionally.

Consciously or unconsciously, Maybeck shared Sullivan's insight that "the ability to charge buildings with subjective significance" depends "not on scholarship, but on man's own powers," and that "all nature's manifold expressions of function were at the disposal of the man wishing to create an art of expression." In 1900 this was architectural heresy. It still is. It made Maybeck a nonconformist, as far as the American *Beaux Arts* was concerned.

Daniel Hudson Burnham said that you could not sell art in America. Be that as it may, if you went to Maybeck, art was what you bought. As a result, Maybeck's greatest gifts, the very means by which he could have made his greatest contribution to the community, were his greatest handicaps.

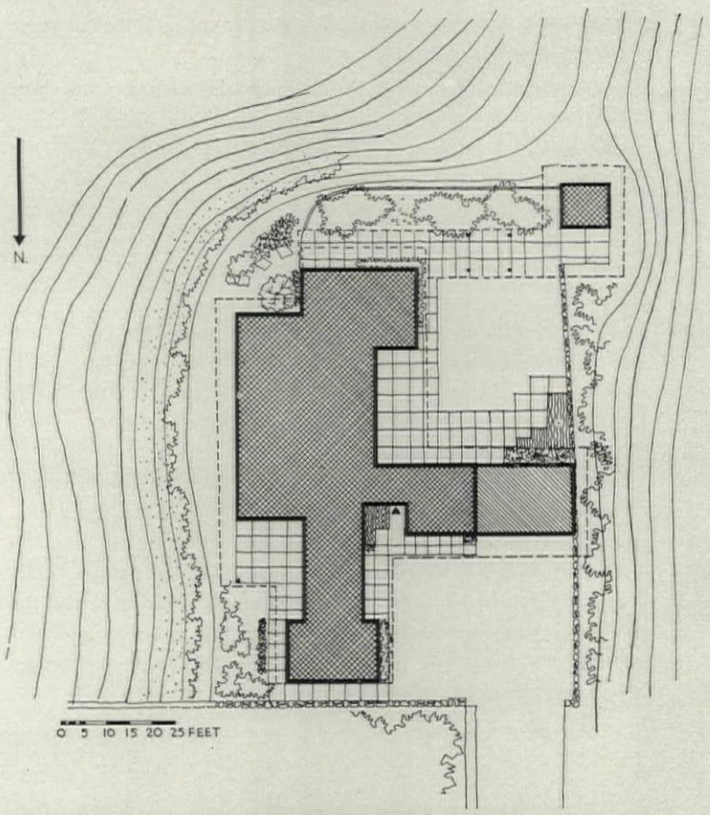
Americans are the greatest organizers since the Romans. Not only have they produced the standardized article, but they themselves are the greatest market for it. This is true in architecture as well as in industry. The custodians of wealth, the men who spend millions of dollars (often money belonging to others) have obligations and attributes of their own. They want to see what they are going to buy, make sure that they get what they ordered, and that it is delivered on time.

This means that in terms of business success, the greatest architectural opportunities are offered to the minor talent, the man who has a standard, well advertised article for sale. The artist, the experimenter, is *persona non grata* to the business world, even when he offers it something better than it bargained for. Buyers of architecture want to be sure of their ground, know what they are getting beforehand. They do not want to order something which is in the artist's mind—they want something they have seen. This is what always happens when the patron is set above the artist. When the patron sets the problem, he can only order something he has seen. When the artist sets the problem, he is only limited by the limits of the situation and his own ability to live up to them. And in its heart of hearts, the architectural profession knows this only too well. But even if they have the ability, few men have the courage to remain the artist, to take Maybeck's course. The man who does is secretly admired. This, presumably, is the basis of this year's AIA Gold Medal.

But if society is going to release the creative powers of the individual, men such as Maybeck must be given more than medals. They must be afforded the opportunity to work. But this opportunity is not the gift of the profession alone. So, in living up to its ideals, in salving its conscience with a tribute to the artist architect, the titular leaders of the profession have, perhaps unwittingly, brought us all face to face with the leading question posed by Maybeck's life and work. In the words of William Merchant, "How can society be so arranged that it can avail itself of the potential gifts of such a man?"

A house that eats, sleeps and works with the view

LOCATION: Portland, Ore.
PIETRO BELLUSCHI, Architect



Architect Pietro Belluschi completed one of his most fascinating houses not long before he tore himself from the Northwest "for keeps" to head MIT's school of architecture in Boston. It is a subtle "flat-top" from the hands of a man who helped make the pitched gable the trademark of the Northwest. And it is set, not in flat country where it might "echo horizontal ground planes," but on a shelf against the west Portland hills.

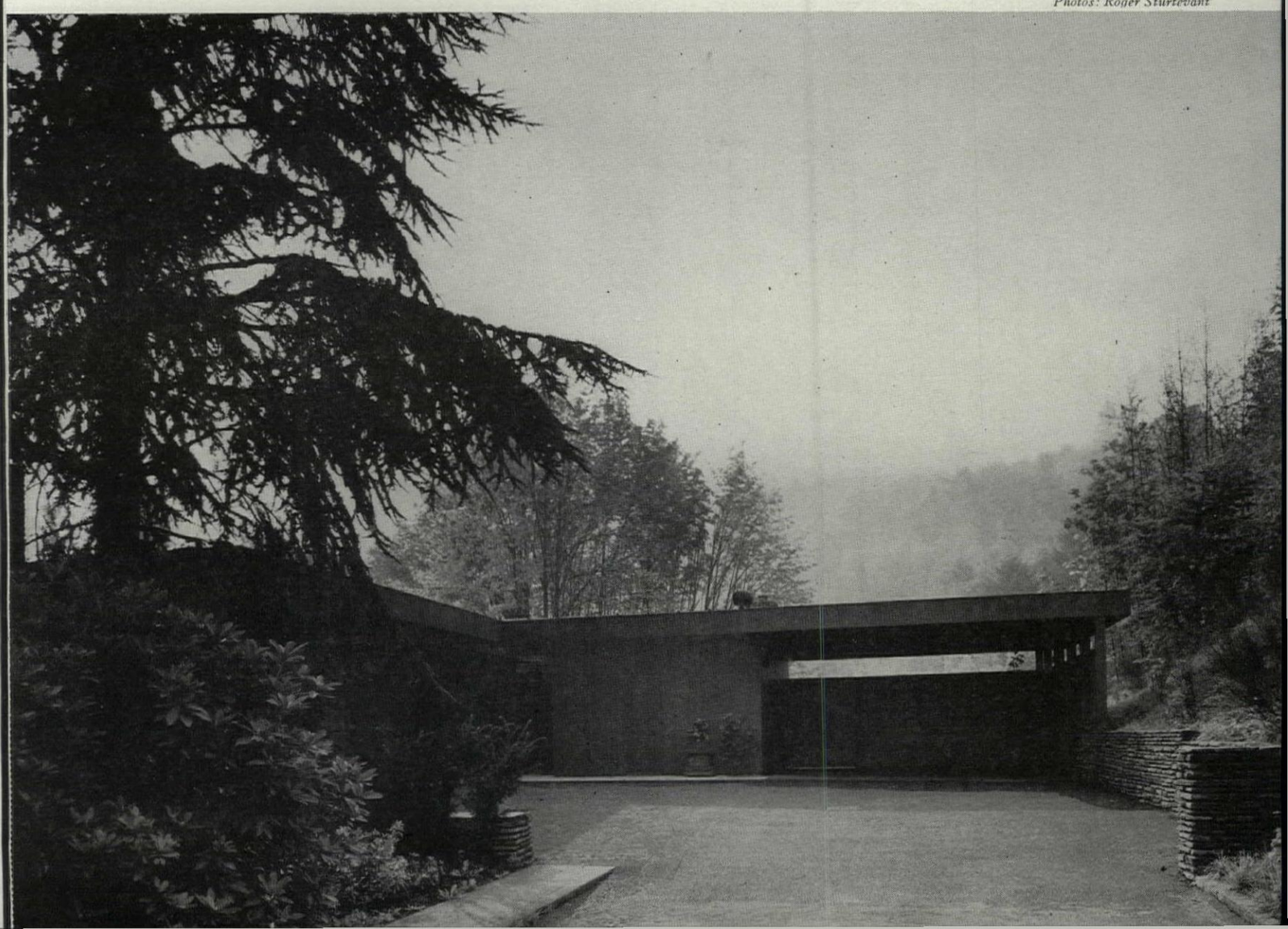
Quite obviously this "flat top" is anything but coldly rational. As the photograph conveys, it has the quality rare in architecture of being serene.

The owners wisely picked a "dead-end" site, almost peninsular in character.

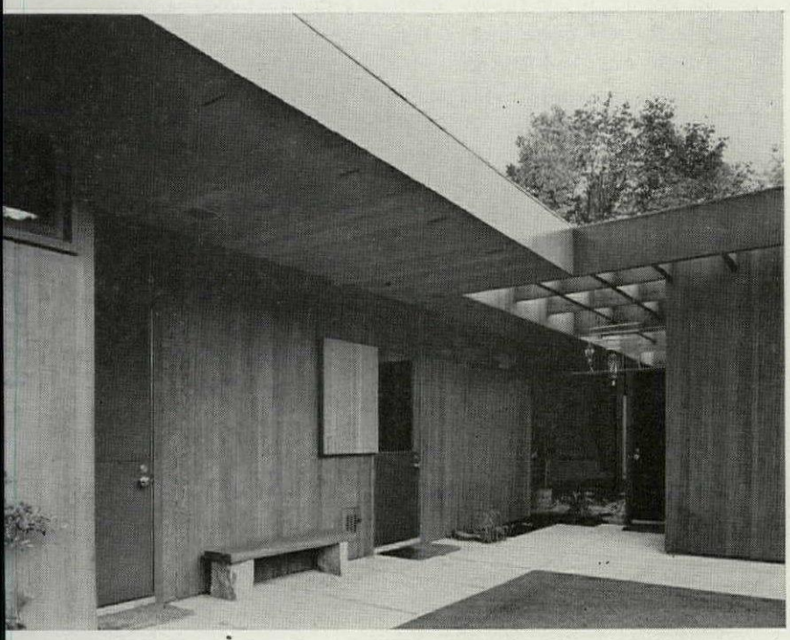
The architect started the house behind an adequate turnaround court (the first in a whole series of subtly managed courts). The garage wing is a polite but firm barricade.

Since Portland's citizens would rather look at Mt. Hood than sleep or eat—and will compromise by looking at Mt. Hood while they sleep, work, or eat—the entire house is oriented toward this view (off to the left of the plot plan).

Photos: Roger Sturtevant



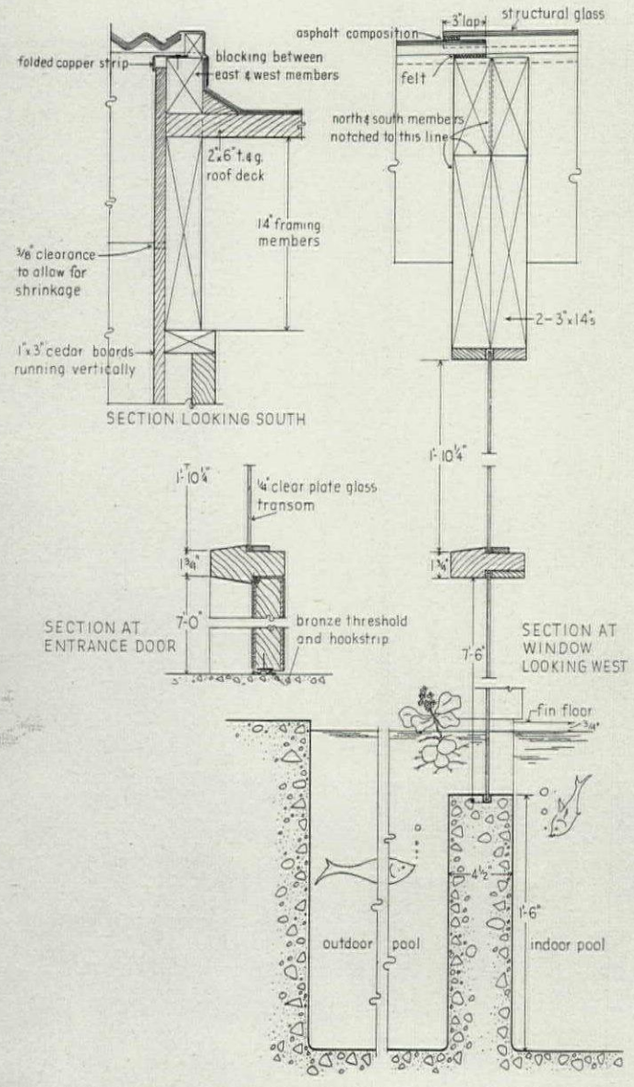
Subtleties of open planning: the quiet entrance and the pivoted passage directed to the "big sweep"

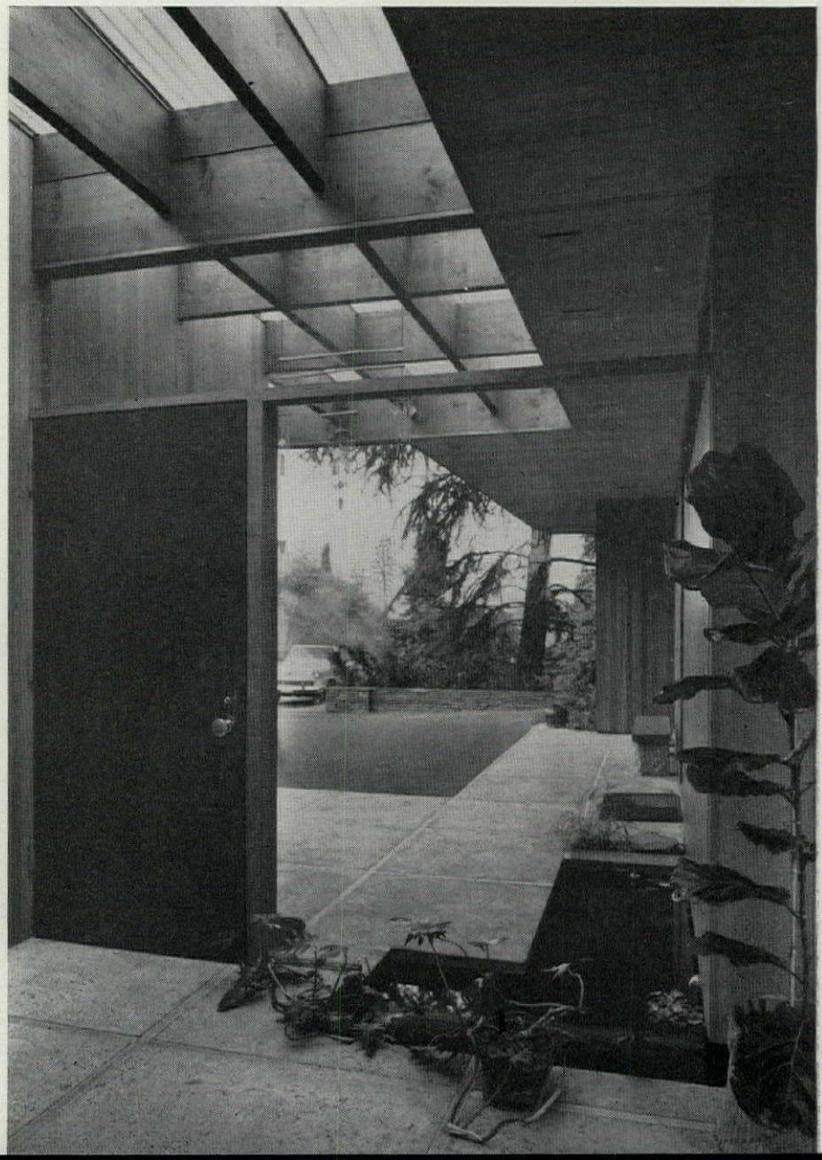


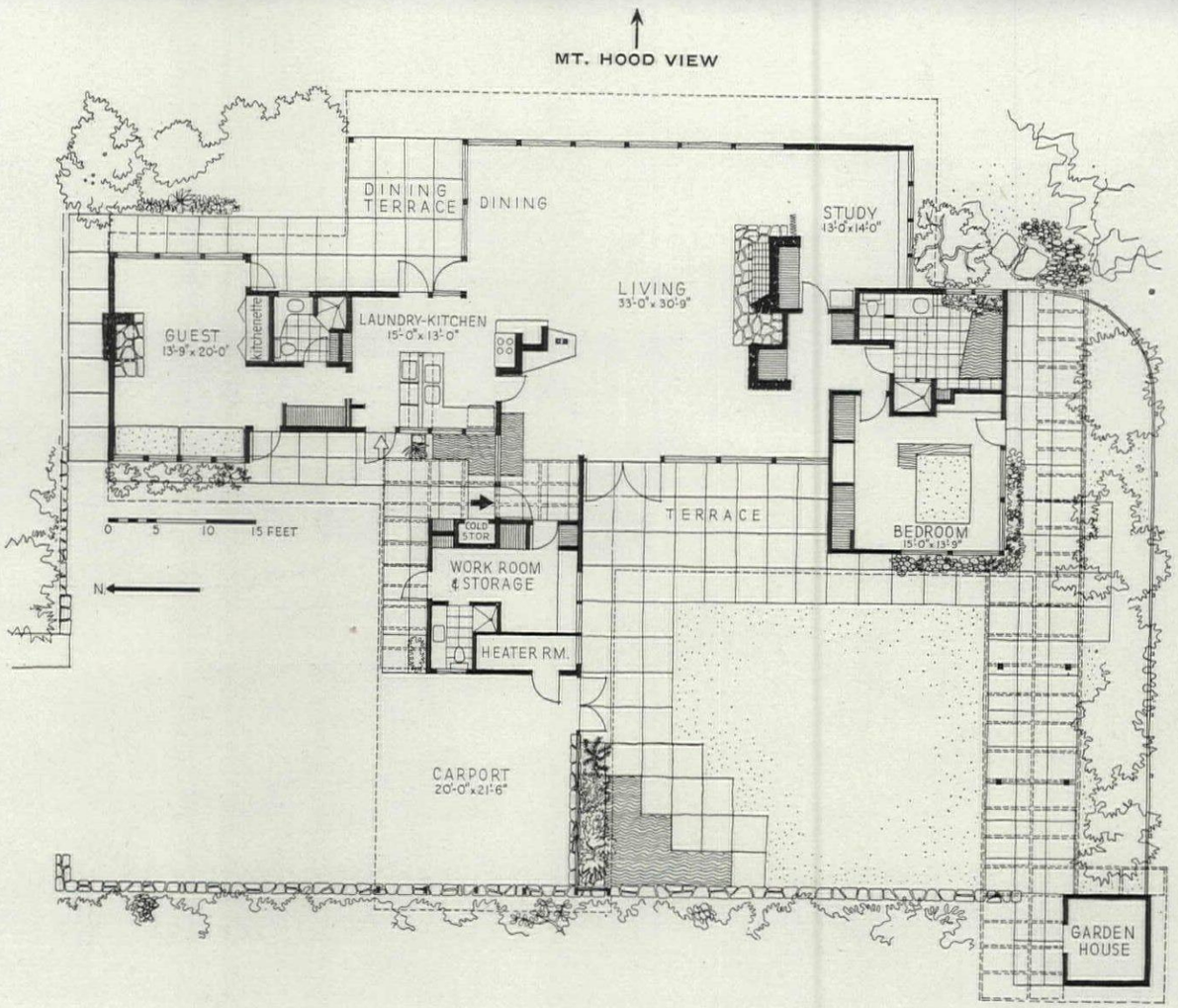
A quiet entrance is architect Belluschi's prelude to his living-room climax. As the plan shows, the architect obtained no fewer than five separate doorways off his one dead-end forecourt; yet few would ever notice that there are so many. The view at the left shows three of them: the door to a private apartment, the Dutch-door service entrance, and the main entrance under its trellis.

Looking back out again (below) the visitor notes how subtly even the smallest detail emphasizes the open-planning theme, which is always a theme of *slightly interrupted continuities:* the trellis continued through the entrance and transmuted in mid-career into a skylight; the pool slipping through under the big plate-glass sidelight. Only the door is a solid barrier: it is more piquant to look around it.

The *look-around, walk-around* device is indeed the key device of open planning, and nowhere has it been used more skilfully than in this house by Architect Belluschi. The visitor does not come straight into the house—he is swung left by a small passage to enter the big 30′ x 33′ living room directly facing the sudden sweep of a view to "Mt Hood and glory," through double plate-glass windows. In the big living room, again, a pair of pipe columns (left in big picture) and the massive fireplace are the two main pivots. The private quarters are reached by going around the big fireplace, and the living-kitchen by circling around the pipe columns and barbecue chimney. The plan is characterized by such cranked passages between spaces big and little.






MT. HOOD VIEW
DINING TERRACE
DINING
STUDY
13'-0" x 14'-0"
LIVING
33'-0" x 30'-9"
GUEST
13'-9" x 20'-0"
kitchenette
LAUNDRY-KITCHEN
15'-0" x 13'-0"
TERRACE
BEDROOM
15'-0" x 13'-9"
0 5 10 15 FEET
N.
COLD STOR.
WORK ROOM & STORAGE
HEATER RM.
CARPORT
20'-0" x 21'-6"
GARDEN HOUSE







Subtleties of design for open living

A sense of shelter with a flat roof. The terrace, like many another, serves as an outdoor room; but two feaures especially distinguish it. One is a gift from the balmy climate: the grass is brilliant emerald green even at Christmas. The other is a gift from the architect: the terrace roof overhang has the effect of a ceiling. Said one observer, impressed, "the living room ceiling and terrace overhang seem to be just one plane buoyed up by something secure but unknown." (Lower photo, opposite.)

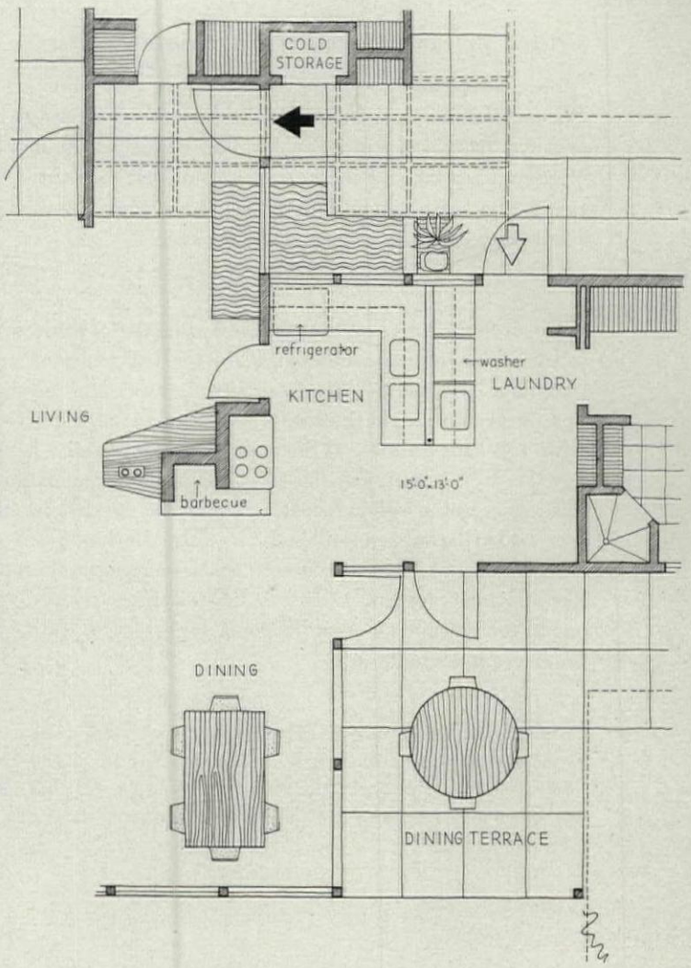
The unusually wide fascia band (18″) with which the architect bounded this flat plane was indeed one of his best inventions. By its amplitude it gave a sense of domesticity and protection; by its uncompromising horizontality, an air of peace. It endowed a flat roof with the emotional value of a pitched roof. (Upper photo, opposite.)

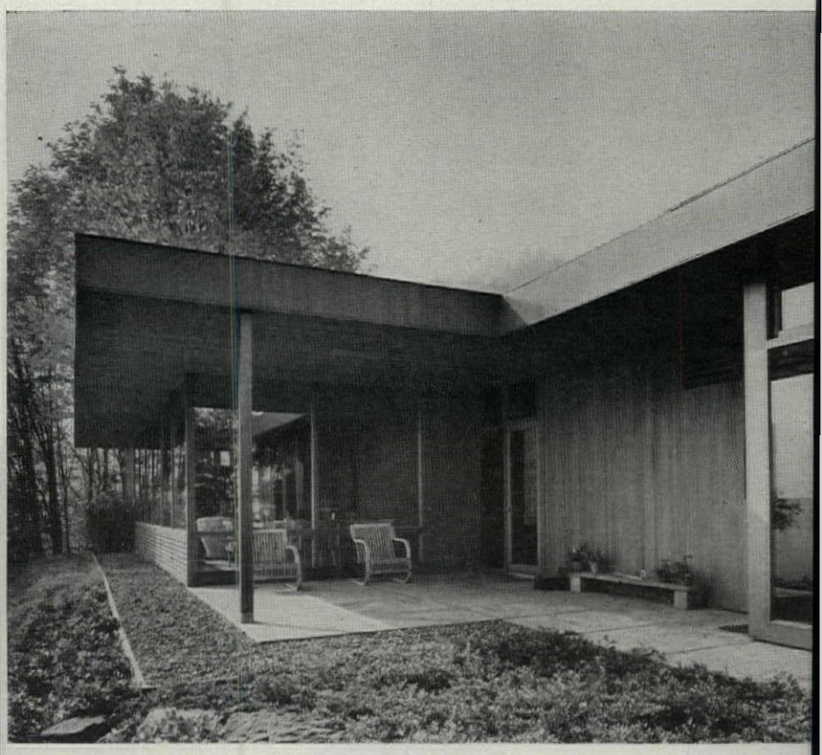
Repeats of color and texture, indoors and out, were another means of subtle unification. The woven wood screen texture of the carport (upper photo opposite) recurs in the bedroom ceilings (page 169); and the same red is found on the plastic kitchen countertop, the specially enameled refrigerator and stove, and the structural glass wall of the unusual bathroom (page 169).

Open cooking and dining. The house is so planned that the sociable, beauty-loving housewife can worship Mt. Hood even while working at her cookstove, or can take a single side step and converse with guests in the living room from whom none-the-less her culinary implements remain hidden (plan, photo below).

If a guest sits at table in the dining alcove, the sense of being "next to the kitchen" is pleasantly qualified by the openness of glass-topped partitions that open a peekview up through the entrance skylight. (Photo below.)

And again it is possible with three steps to go out and dine on the special dining terrace tucked away in the plan.





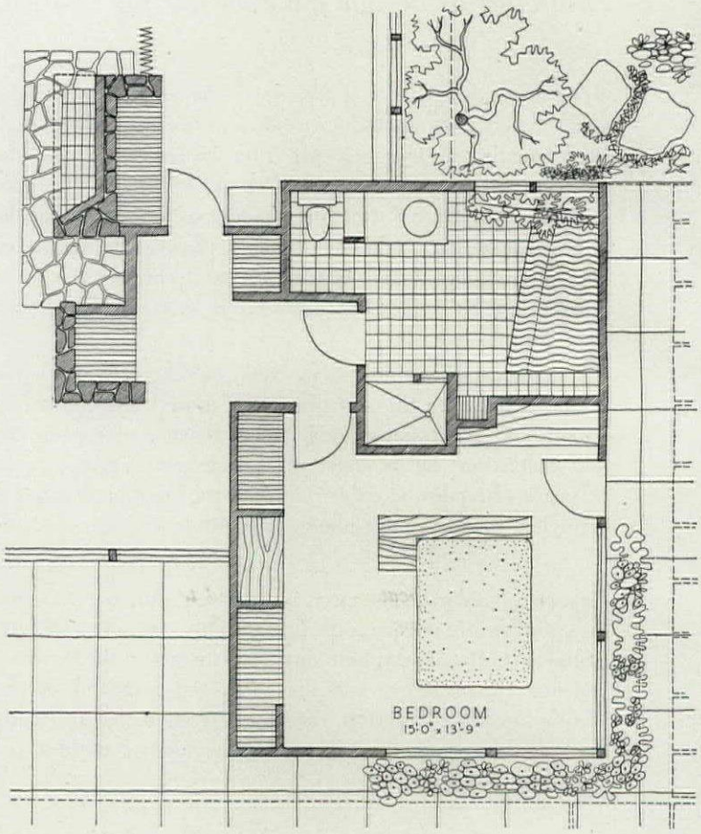


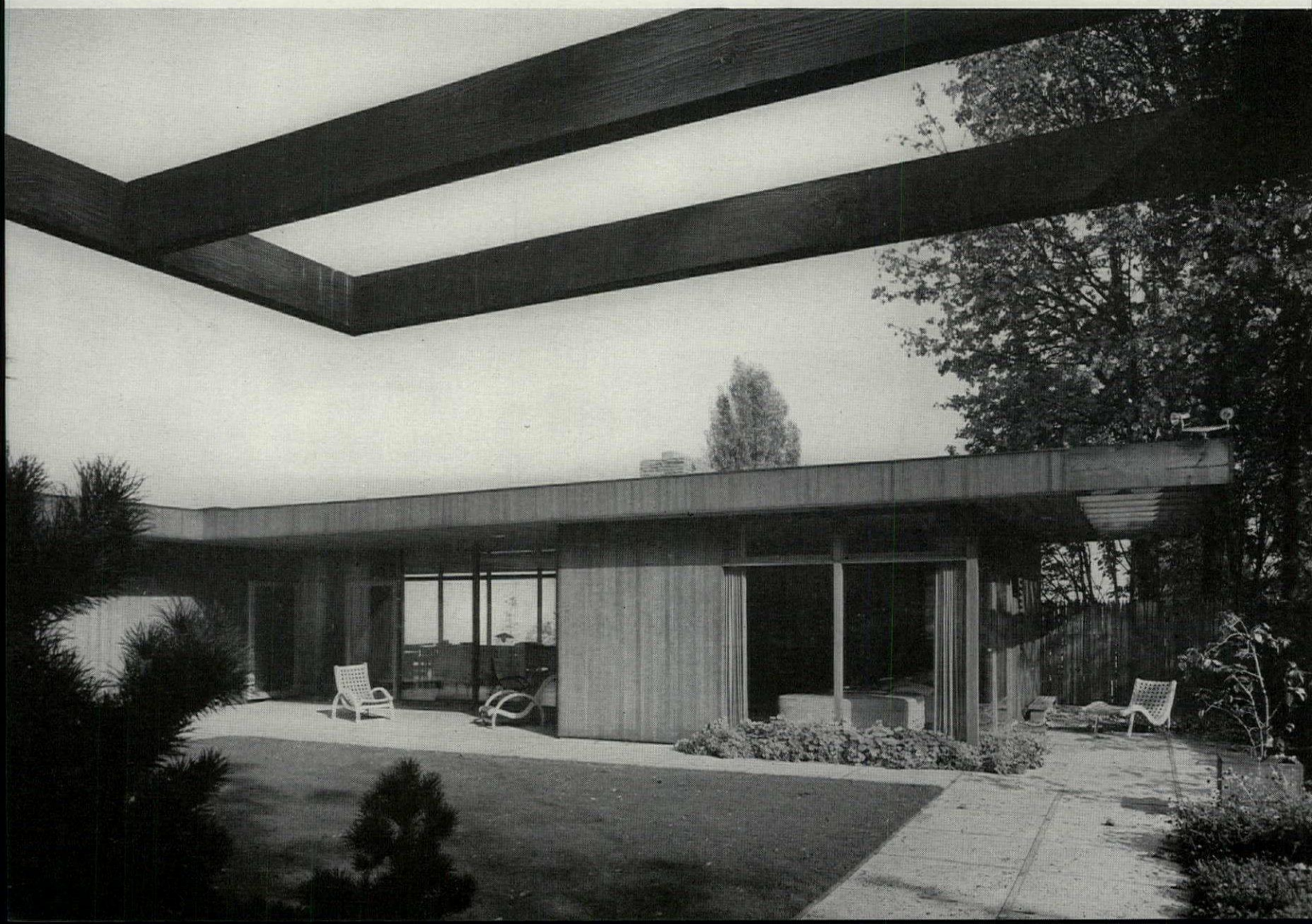
And a private area with a Roman bath

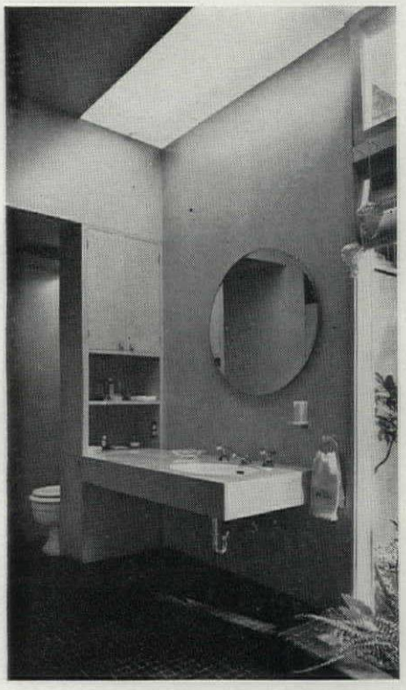
Placing the master bedroom at the far end of the court, the architect has given it privacy despite its glass walls; and the close-by trees take off the heat of a southwest exposure. And just as the dining room has its own little court, so the bedroom too has its own special open patio.

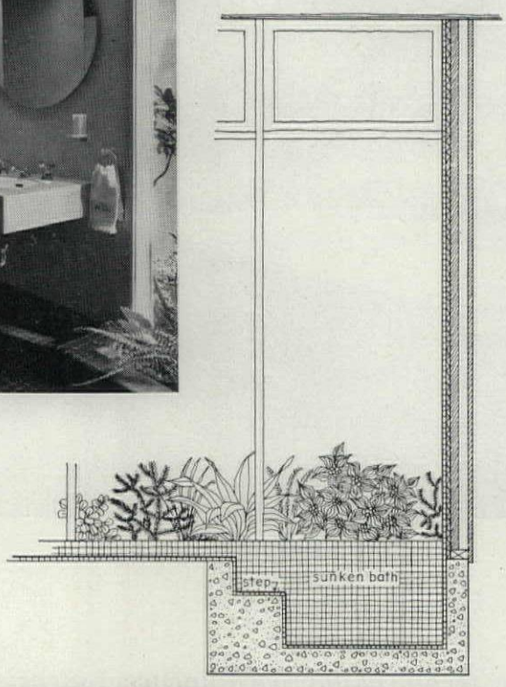
The private Roman bath that Belluschi planned for this house is something of a consummation in the technique of open planning. Because the hill drops steeply away and the situation is protected, the architect was able to let glass come down to a ledge almost at the floor (vertical section) so it is possible to "worship Mt. Hood" even in the act of bathing. The copper-tube radiant heating pipes are carried through even under the sunken built-in bath. (Mrs. Burkes, the owner says, "I sometimes do my laundry there standing in the water like a Roman woman.") The skylight, a minor repeat of the one at the entrance, makes the room seem bigger, unlike the usual cramped bathroom.

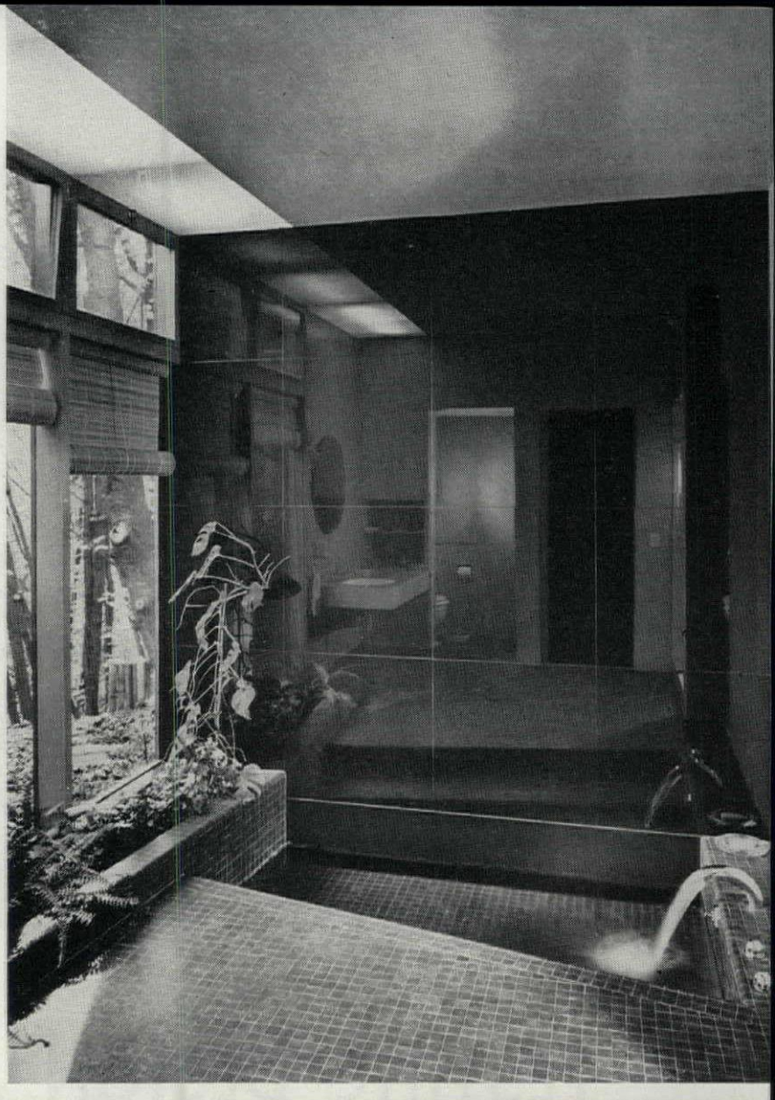
Outside walls are of 2 x 6″ solid planking. 2 x 4″ strips are nailed to the exterior at 3′ centers, covered with building paper and 1 x 3″ t & g cedar boards vertical. The siding is bleached and lightly oiled, has something of a greenish yellowish cast that harmonizes with the greens around it.



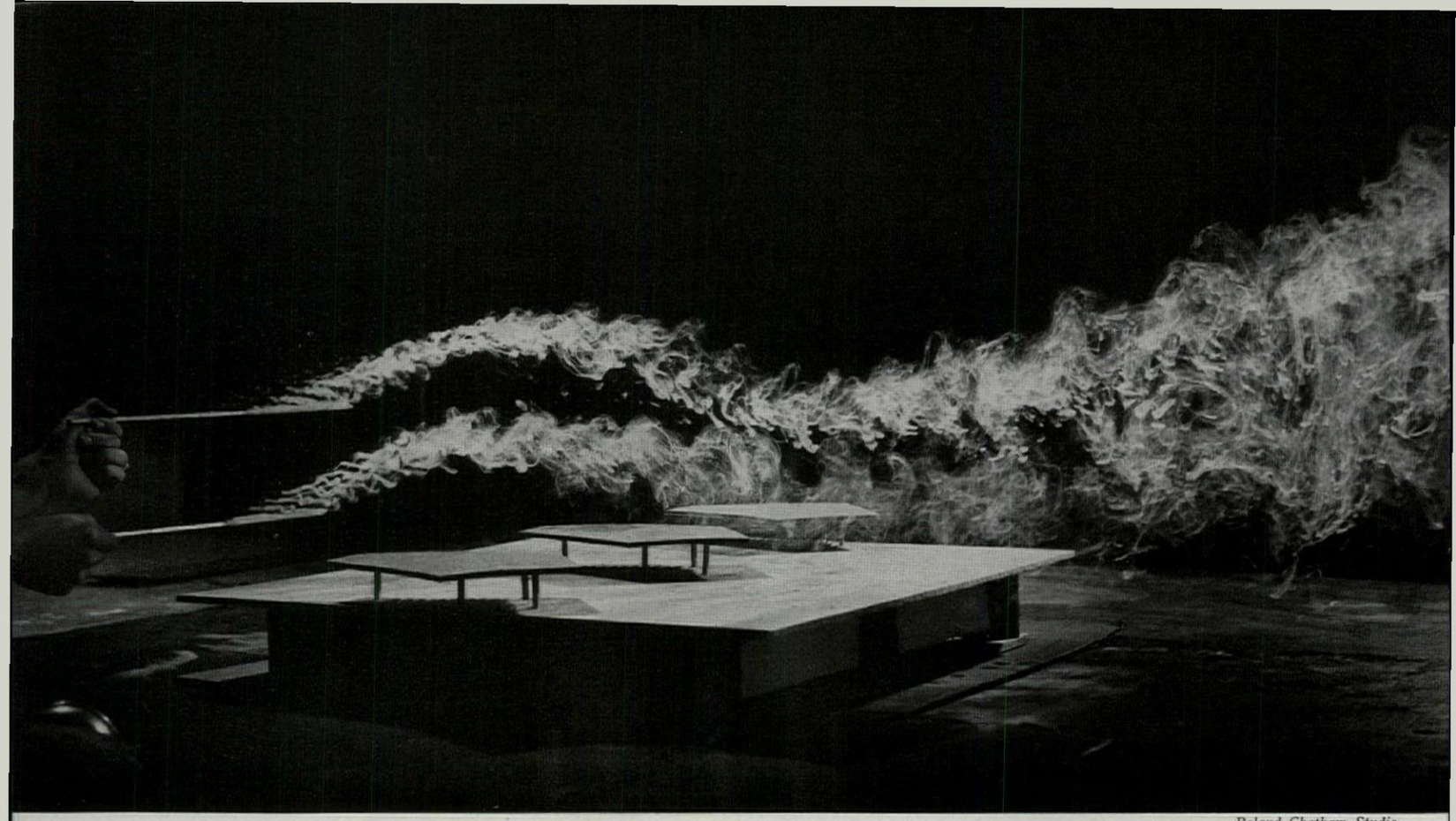





step
sunken bath







Roland Chatham Studio

TESTING DESIGN: *a new technical approach uncovers surprising facts about the natural ventilation and lighting of buildings. The tools: a wind tunnel and sky lab.*

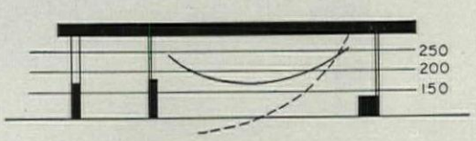
Before you build a wall, you know just how strong and insulating it will be, but do you know how well the geometrical shape of the wall will work—that is, how will the air move within it . . . what will be the natural lighting?

For the last two years, the State of Texas has been working on questions like these at the Texas Engineering Experiment Station in College Station, Texas, headed by Executive Director Arthur W. Melloh. This summer the first reports will be out.* The program has brought together architects, physicists, aeronautical engineers and $50,000. And although they have only begun, there are already some answers, in comparative analyses of typical sections of classrooms to determine which are the best lighted and ventilated. (See next 8 pages.)

In charge of the program, asking the questions, has been an architect familiar to most school designers in the country—William Caudill. But the answers will not stay in the classroom . . . when a careful study in low velocity air movement (not airplane speed, but room speed) begins to prove new techniques for cooling by natural indoor air movement, the entire building industry should listen.

It has already been demonstrated that the answers will not stay in Texas; word of the Engineering Station's pretesting of models has brought requests from architects as far away as New York (Ketchum, Gina & Sharp) to experiment on models for buildings under design to see if the lighting and ventilation works. The Station will do this, for a fee, so long as it is in line with their program. Next compartment of the environment to be tested and integrated with data for the scientific approach to design, will be acoustics. And not only is the whole program aimed to provide a new design medium by comparing the geometry of architecture, but it also is a valuable education tool for architectural students in College Station at Texas A & M College.

The main testing instruments are a low velocity wind tunnel to reproduce air currents through scale models of buildings, an artificial sky made of plaster to test models for lighting under variable simulated natural skylight and, on the wide stretch of a nearby airport, a full scale experimental classroom which can be revolved on a track and re-fenestrated or re-roofed at will to test full scale effects. Necessity for testing in model form is indicated by the sketch below, showing different light curves for



similar fenestration on two days. Solid line shows distribution by actual meter reading on one day. Dash line shows distribution in same room, read with same meter, next day. The sky varies too much to enable adequate comparisons to be made by light meter in completed rooms.

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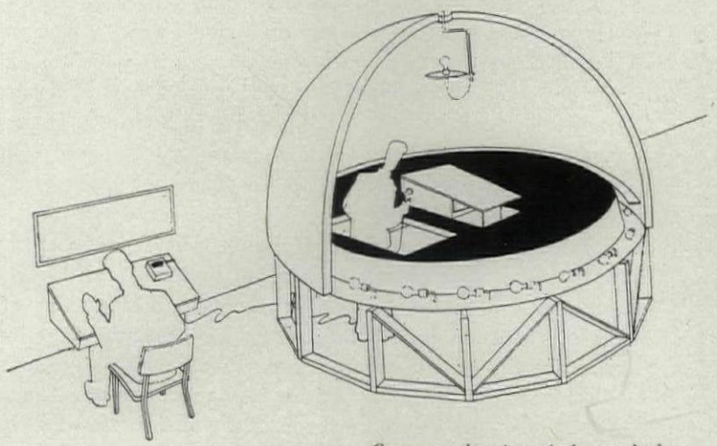
*Research Report No. 21 *The Feasibility of Using Models for Predetermining Natural Lighting* by E. E. Vezey.

Research Report No. 22 *Some General Considerations in the Natural Ventilation of Buildings* by W. W. Caudill, Sherman E. Crites, and Elmer G. Smith.

Research Report No. 25 *The Measurement of Low Air Speeds by the Use of Titanium Tetrachloride* by E. G. Smith, B. H. Reed, and H. G. Hodges.

Research Report No. 26 *The Feasibility of Using Models for Predetermining Natural Ventilation* by E. G. Smith.



Cut away drawing of plaster skydome

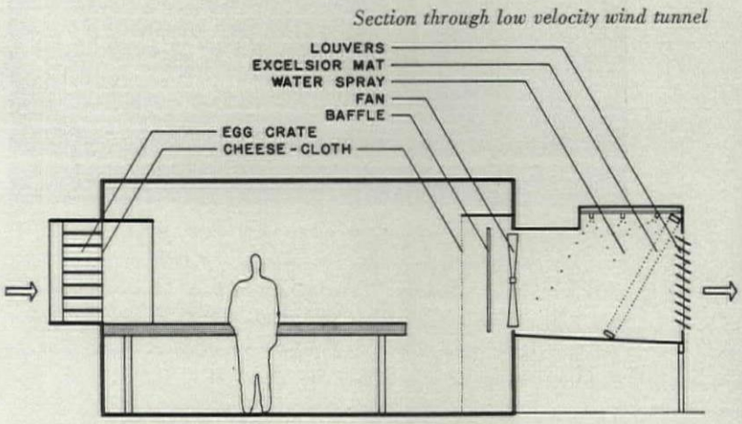
Lighting

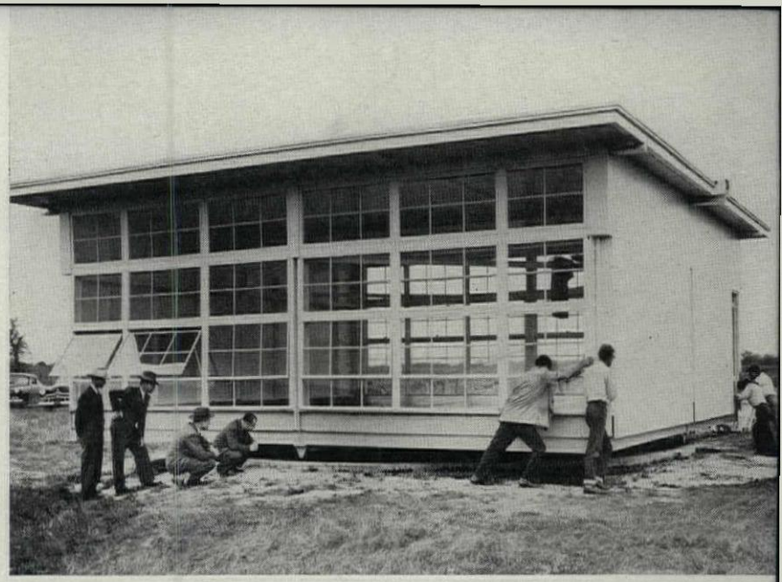
Before they did anything else, the testers had to determine the validity of their artificial sky. Could it reproduce conditions in a model room faithfully, compared with natural light in a real room? They took direct, obvious (but not easy) steps to find out: long sets of readings were made in the full scale experimental classroom out on the airfield, and comparative sets in various sized models of that room under the artificial sky. Results are charted below photos of model and full scale experimental classrooms. Similar tests on other existing buildings, and their models, also were reassuring. And although readings could not often be duplicated exactly, it became obvious that here was a precise method to compare daylighting of buildings in model form—which, because of normal sky variations, is virtually impossible in the buildings themselves.

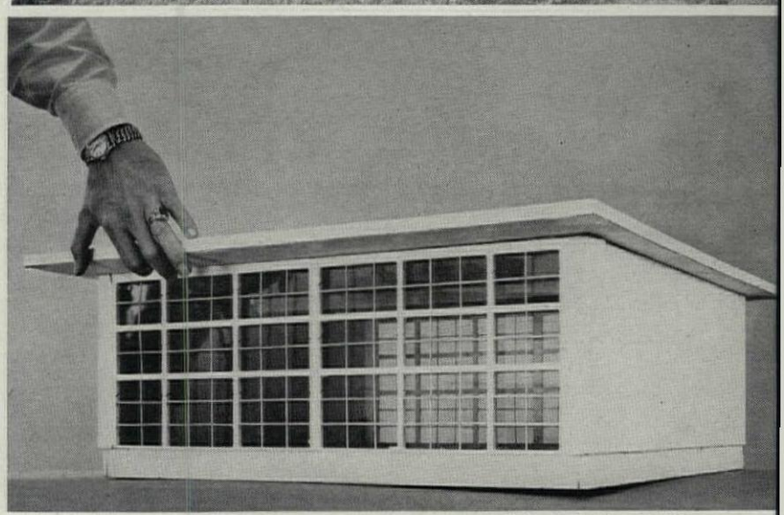
Ventilation

The question was similar in respect to air movement. Would small streams of air behave similarly in a model to large streams of air in full scale? A rule of aerodynamics indicated they would not: the principle of "Reynold's Number" is that speed is inverse to size, i.e. that the behavior of air going through a 10′ high room at 15 mph. could be duplicated in a 1′ high model only by a stream of air traveling at the difficult speed of 150 mph. But the testers took a lengthy look into that too, and established that they were somehow, in these low velocities, not limited by this rule. In a 2′ high model, if detailing was precise, they could operate in the wind tunnel at speeds as low as 160 ft. per min., and their patterns (made by the titanium tetrachloride) were duplicates of patterns made by smoke tests in the full scale experimental room.

Section through low velocity wind tunnel



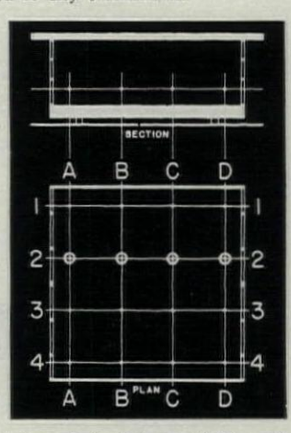




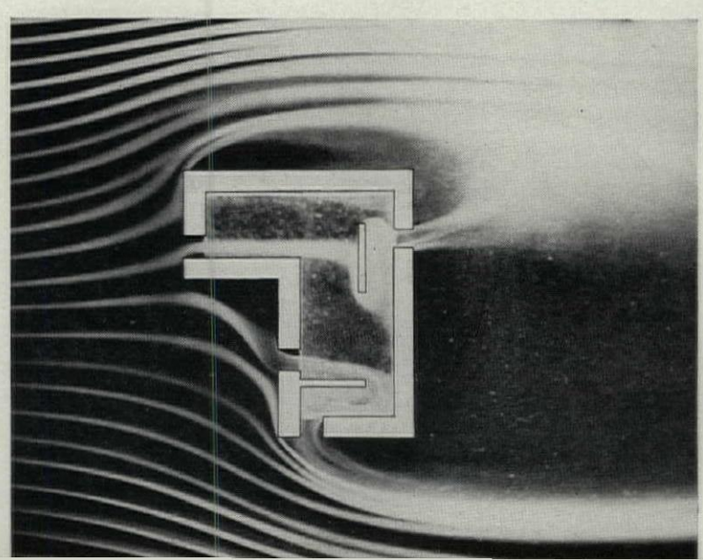
Roland Chatham Studio

Full size experimental room (top) is adjustable in fenestration and roof shape, and, like scale model, can be revolved to any orientation.

	A2	B2	C2	D2
	foot candles			
Actual sky				
30′ building	120	75	71	117
Artificial sky				
2′ model	106	73	73	106

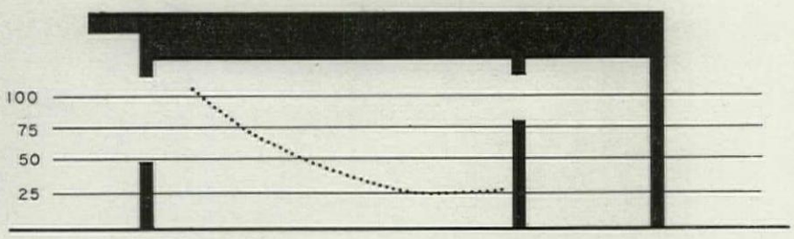


Titanium tetrachloride is released in wind tunnel to test ventilation of various shapes. Building in plan below shows how placement of windows and partitions affect the flow from windward side, left, to leeward side.

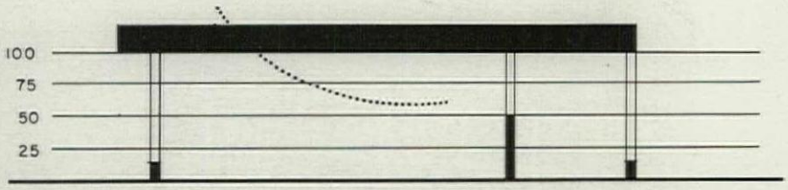


LIGHTING

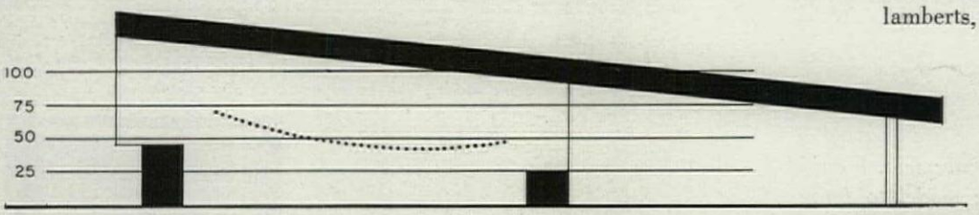
How some classroom sections rate



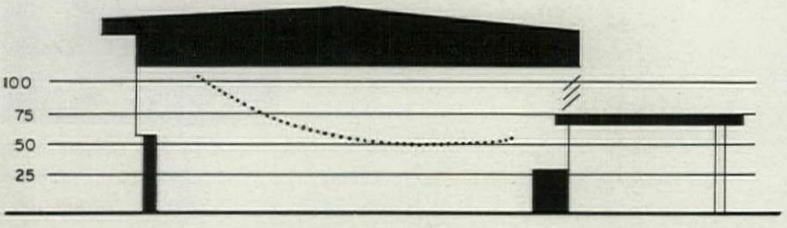
Ordinary windows cause extremely bad brightness conditions; intensity varies sharply, resulting in unacceptable 1:4.2 distribution ratio.



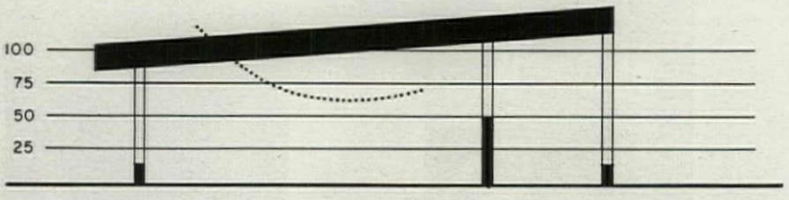
Intensity is very good (30 foot-candles are adequate) and distribution is quite good, but brightness ratio is 1 to 20.8, rated excessive.



Long sloping roof with exterior hall gives fair intensity; window baffles can make brightness ratio satisfactory; distribution is excellent.



This has excellent distribution and intensity but extreme sky brightness through unprotected windows (left).



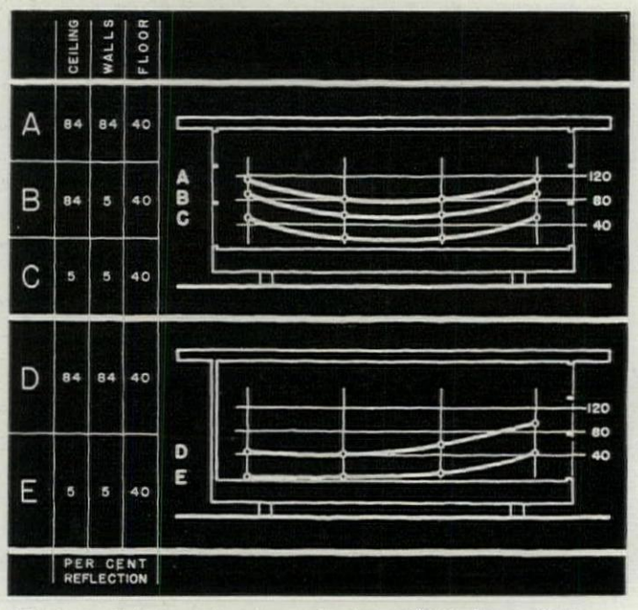
Brightness ratio is bad (1 to 19.2). Intensity of light is very good and so is distribution, with only 1.7 to 1 drop.

On this page are the comparative light curves of several classroom sections, beginning with a model which was popular 30 years ago, and, unfortunately, is still popular: the classroom whose outside wall is cut here and there by a conventional window. Note the difference in both distribution and quantity of light inside this classroom, compared with more inventive types below, whose window walls are continuous.

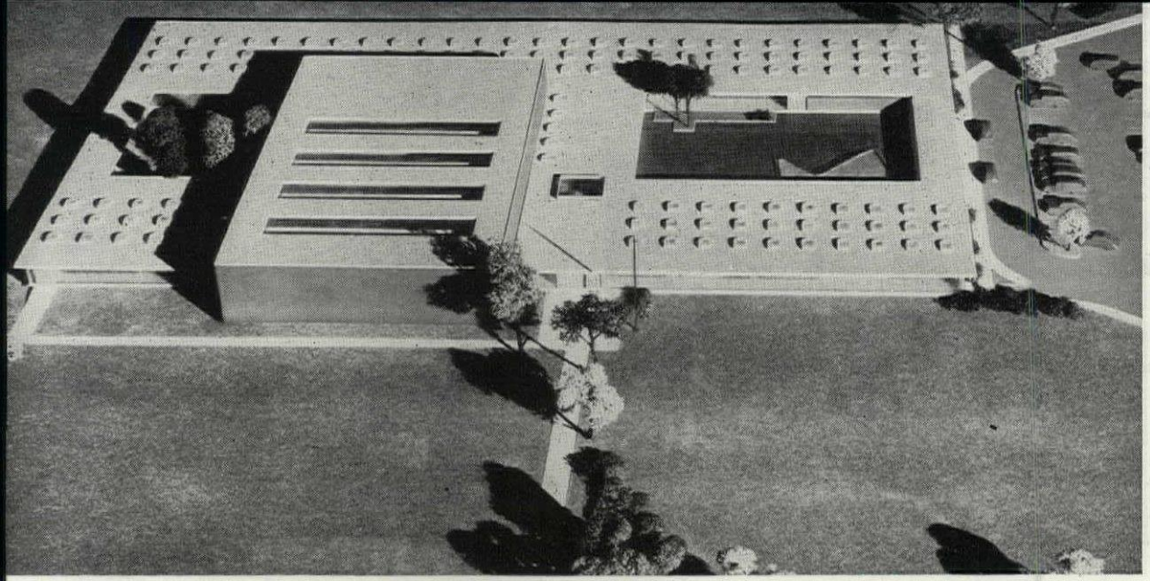
Intensity and distribution of light, however, are not the only criteria for effective classroom lighting, and the test setup at the Engineering Station recognizes this. Quality of light is also important; a classroom can have very high intensities and even distribution, yet make poor seeing conditions if the quality of daylighting is poor because of extreme brightness. To avoid glare, some of the sections shown have sacrificed a few foot-candles in intensity by using devices such as louvers. (Distribution is also improved.) The conventional classroom made some attempt to do this by using shades on the windows; when the sun hit some of these shades, however, they became so bright as to intensify the contrast problem.

Tests under the artificial sky can be tied closely to the economics of building a satisfactory structure. For example, Ketchum, Gina & Sharp asked the Experiment Station to test ceiling heights for a school design to discover the lowest ceiling height at which excellent daylighting could be achieved. A 10′6″ ceiling was found to do the job well; lowering it to 8′ decreased the lighting level by 40%; raising it to 12′ increased the level only 16%.

Readings on models on this page were obtained under conditions simulating uniform sky brightness of 1,000 foot-lamberts, without direct sunlight.



Clear new light was also thrown by the artificial sky on the importance of the reflectivity of interior surfaces and furnishings upon the light level held in a room. Tests were conducted as noted above on two different fenestrations, with surfaces of three different reflectances inside. Note direct and sizable increase in light level in proportion to increase in reflectivity of boundary walls, ceilings and floors.

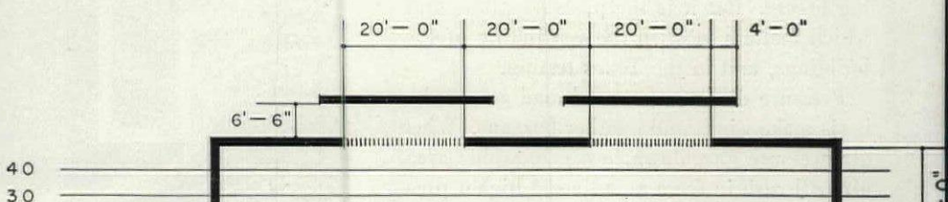


Roland Chatham Studio

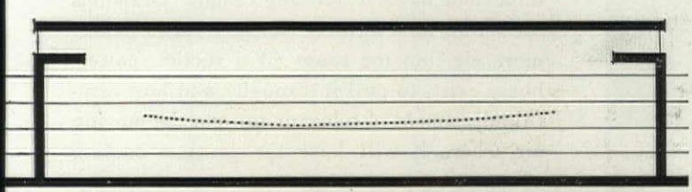
Testing before building

Caudill, Rowlett, Scott & Associates collaborated with Perkins & Will in the design of a large high school in Norman, Okla., a model of which is photographed above. It will have many pretested features, including overhead classroom lighting by roof bubbles. One of the problems was to devise lighting for the big block of central space for gymnasium, etc., which would retain the large simple central mass wanted in the design. Light requirements were high level and generously uniform distribution, although a high near the center of the floor would also be advantageous. On this page are studies of models with their light curves.

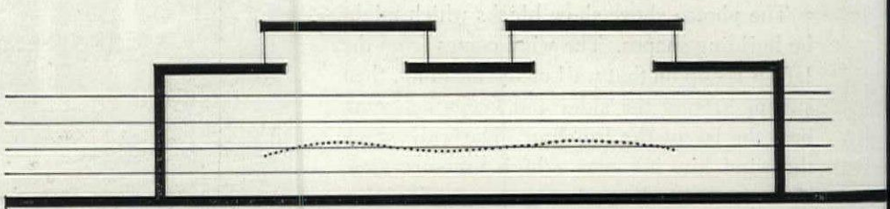
Monitors, with egg-crate louvers, in this case result in very good distribution (only 1.4 to 1 distribution drop) but poor intensity.



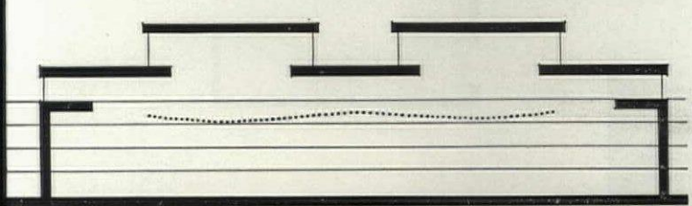
Both intensity and distribution are good (below) but perimeter windows did not fit design so experimenting continued. Note inverted sun and sky controls.



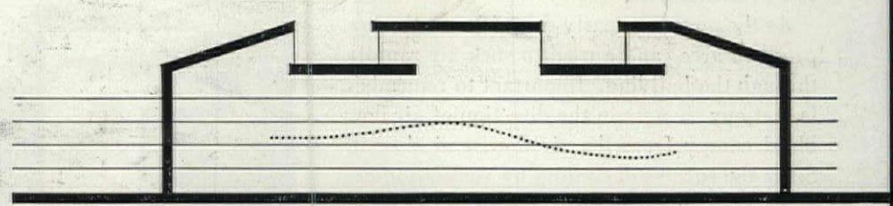
Removing the egg-crates from the monitors raises intensity to a fair level. Distribution remains very good (1.3 to 1 drop).



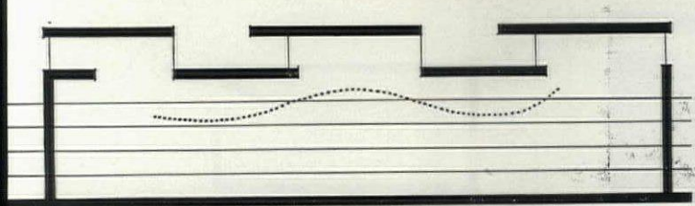
Intensity and distribution continued to improve with addition of monitors but design vote went against this rather elaborate solution.



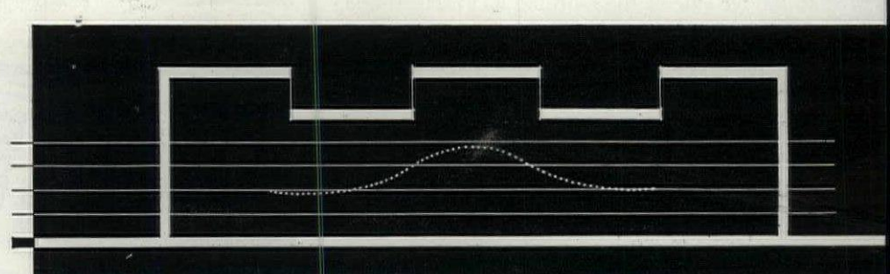
Inverted monitors with pitched roof give fair intensity (20 foot-candles is recommended minimum) and fair distribution.

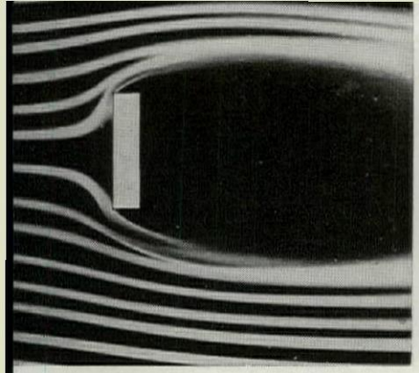


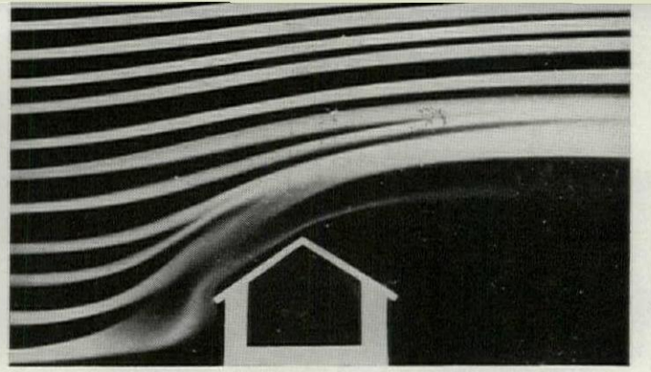
Intensity is good (better than 30 foot-candles overall) with only a 1.3 to 1 drop in distribution, but search continued for simpler solution.



This was judged best solution: good intensity, satisfactory distribution, with peaks where they are useful in design of building.







TESTING DESIGN:

VENTILATION

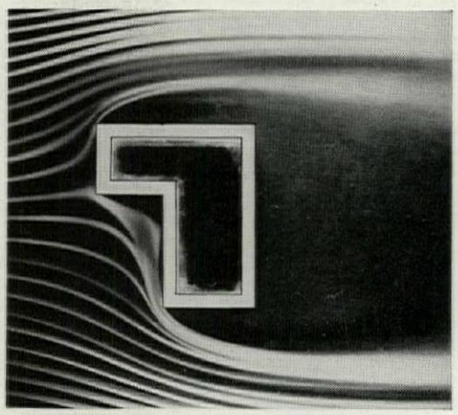
How air behaves

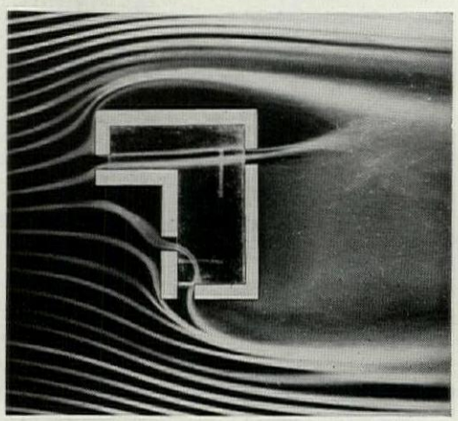
Air moves naturally for two reasons: because of pressure differences and because of temperature differences. The latter is very important in ventilating tall buildings, where vertical thermal currents may be the prevailing breeze. But it is the pressure differential which matters most in the ventilating of low buildings, and in the Texas testing.

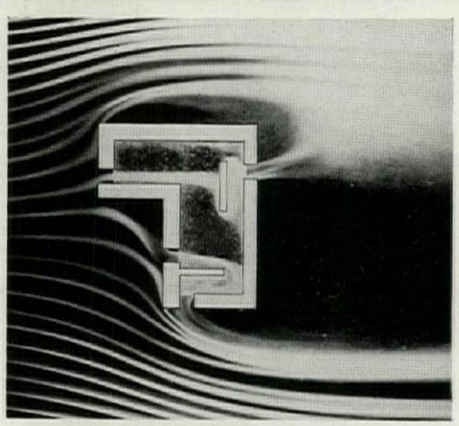
Pressure differences on a broad geographic basis make winds and weather bureaus. When air pressure goes down in a geographic area, air will rush in from an adjacent higher pressure area, attracted by the emptiness; when air moves, of course, it is a wind. The somewhat similar small scale pressure differences around houses are caused by the impact of these winds, because air has a great deal of inertia and does not change direction willingly. This is shown above in the two photographs of models in the low velocity wind tunnel.

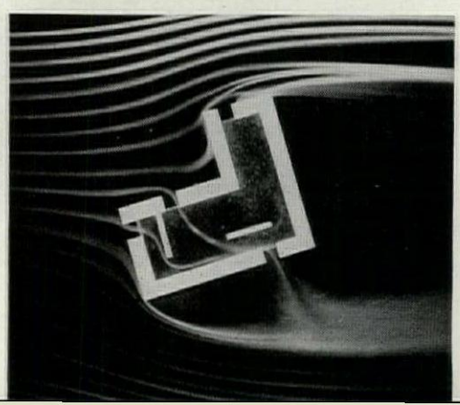
The photos above show blocks which might be building shapes. The wind comes from the left, piles up on that wall of the building, then sweeps around the sides and keeps on going past the lee of the building. The wall which the wind hits becomes a high pressure area. The opposite wall is a low pressure, or suction area, and is an equally important powerhouse for ventilation. The sides, surrounded by relatively high-speed air and solid surfaces are low pressure areas.

As the pictures clearly demonstrate, the low pressure area can be used to suck air rapidly through the building. Important to remember is that any changes in the direction of air flow bleed energy from the air flow, and slow it. Since the success of cooling by ventilation depends on keeping speed of air relatively high, necessary changes in the wind direction should come as late as possible, after the high velocity has been used. The turn should come as close to the lee side of the building as practical and should not be abrupt. In photos, right, note that partitions spread effect of air movement into general turbulence, but only after the straight, relatively fast stream has been used to advantage. Bottom picture demonstrates the importance of knowing the precise direction of the prevailing summer wind, if the ventilation plan is to work.

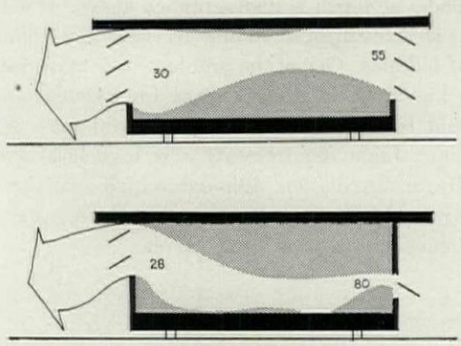




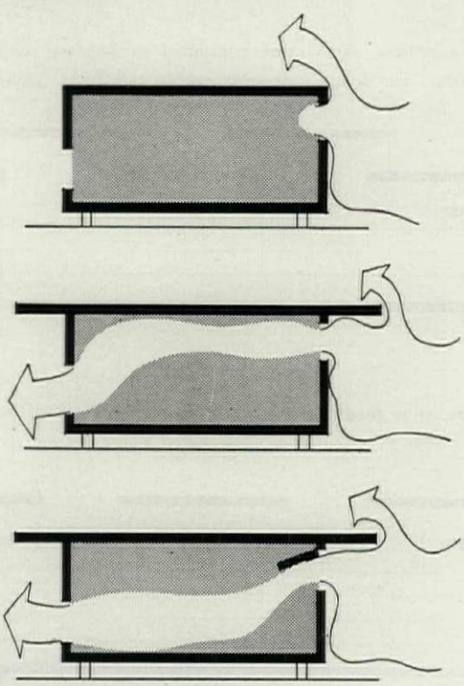


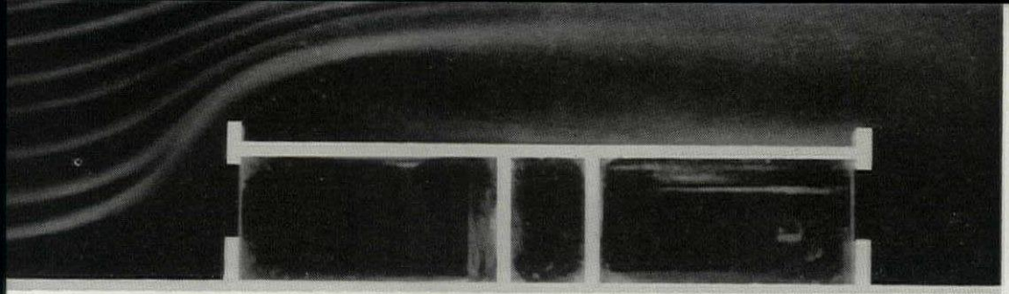


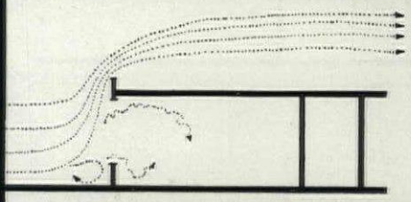
One of the most widely argued design decisions for natural ventilation is the proper size for the windward (pressure wall) and leeward (suction wall) windows for most effective air flow through a room. The answer proved in the wind tunnel is this: a small opening should be placed carefully in the pressure wall to admit a small stream of fast moving air directly on the people to be cooled. A larger opening should be made in the suction wall to pull the air through the room and to widen the stream somewhat (at the cost of slowing it somewhat) before it leaves. The same principle applies, of course, to most rooms: the leeward window should be open more than the windward window; or in a room without through air traffic, the hall door should be opened wider than the window. Drawings of full scale tests, with velocities of air through different size wall openings noted, bear this out.



Tests have shown that careful studies of overhangs, roof slopes and louvers are very important in each building design. Drawings show how an overhang can be used to deflect more air into the room (if a suction powerhouse exists to pull it through) and how careful adjustment of a louver can put the moving air where it will have the greatest cooling effect.



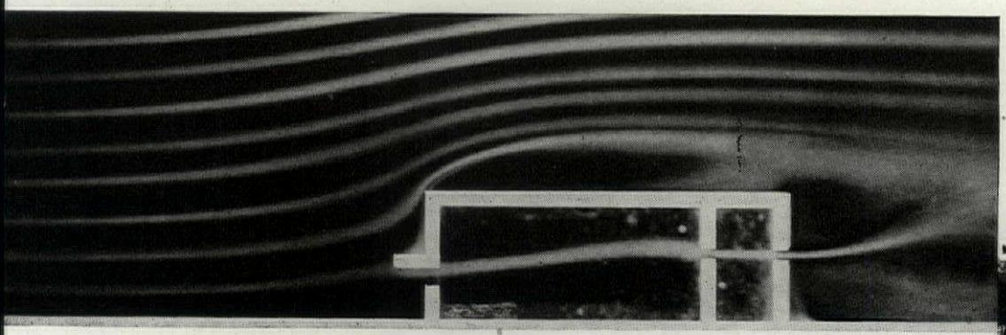


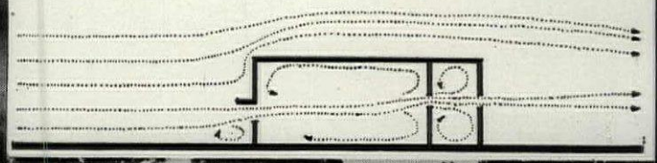


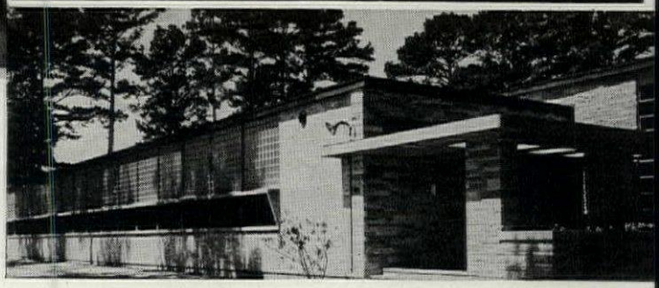
Typical double loaded corridor classroom has little hope for good natural ventilation. Some wind forces in, but no suction pulls it.

Comparisons

This ventilation testing program is aimed primarily to solve major overheating problems in the South and Southwest, but there are few classrooms in any area which could not be improved by better ventilation. Six classroom sections, most of them typical, are shown here tested for ventilation in the wind tunnel. Some of these originally were designed for cool northern areas but are being adapted in warmer areas. Test results indicate this may be a very serious mistake.

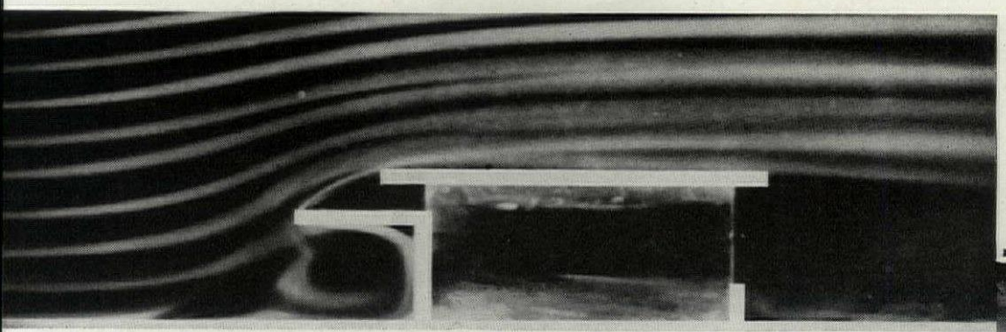


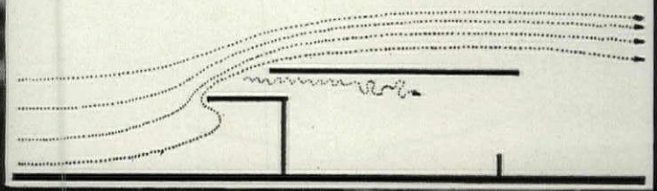




Single loaded corridor with small openings in walls and partitions is good in high wind, as tested, but not so good in quieter conditions.

St. Teresa School, Texas. Walter Rolfe, Architect

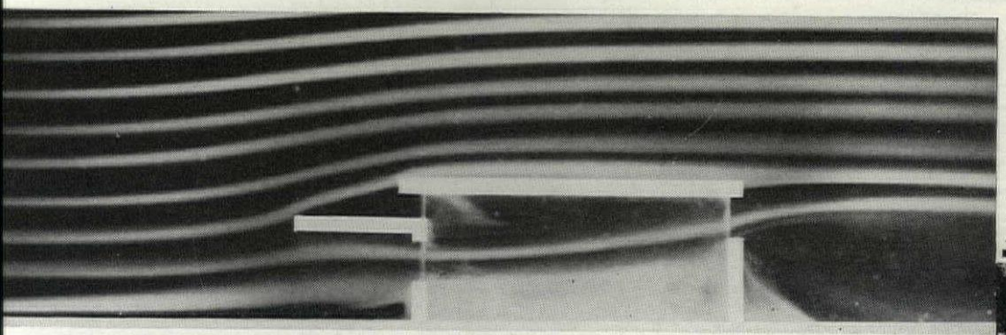


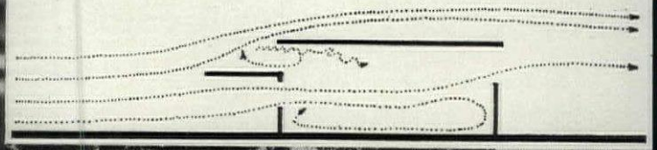


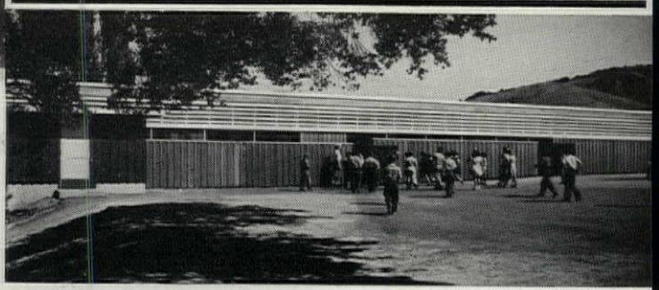


If this section is oriented to wind as shown, there is surprisingly little air circulation. Wind eludes high window intended to catch it. Reversed, section is good.

Acalanes High School, Calif. Kump & Falk, Architects





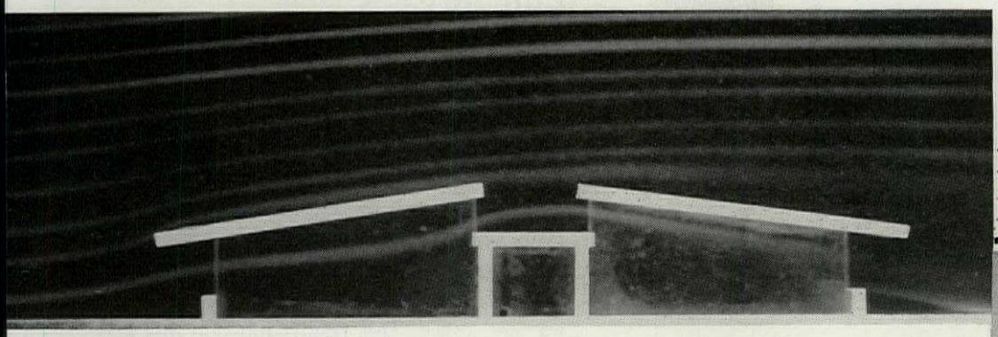


Circulation is good through "living height," but high window above open-corridor actually again catches wind as might be supposed.

Photos (right): Roger Sturtevant

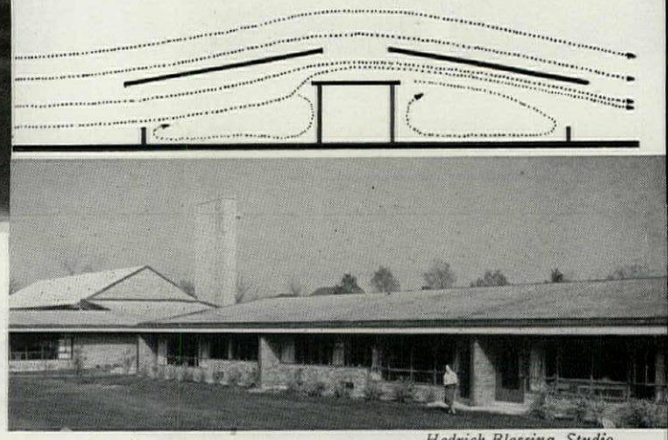
Fairfax School, Calif. Bamberger & Reid, Architects

VENTILATION

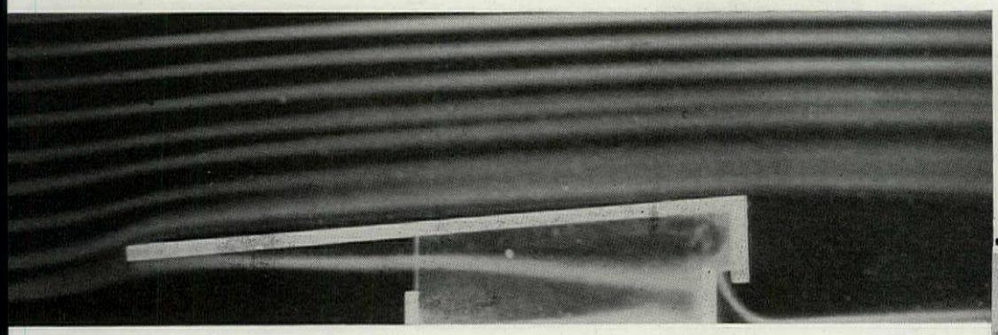


Double-loaded corridor school with dropped hall roof has windward classroom well ventilated, but same air flows on through leeward classrooms.

Blythe Park School, Ill. Perkins & Will, Architects

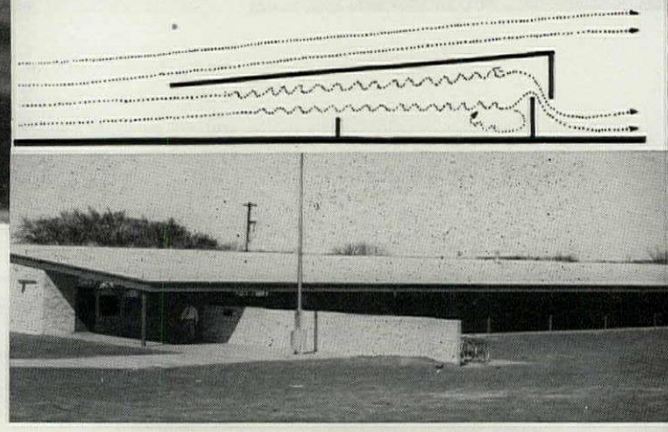


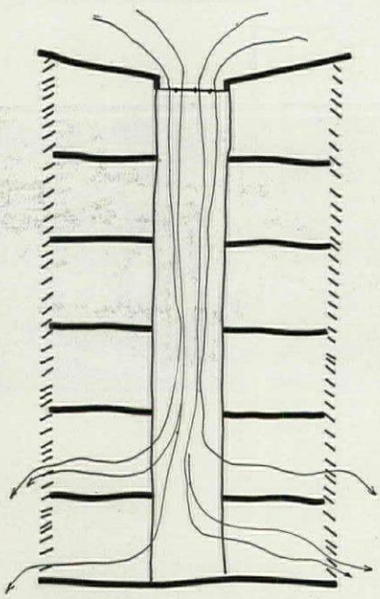
Hedrich-Blessing Studio



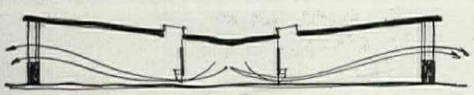
Classroom section with adjacent play shed has good ventilation, especially in fairly strong winds. Not so good in quiet airs.

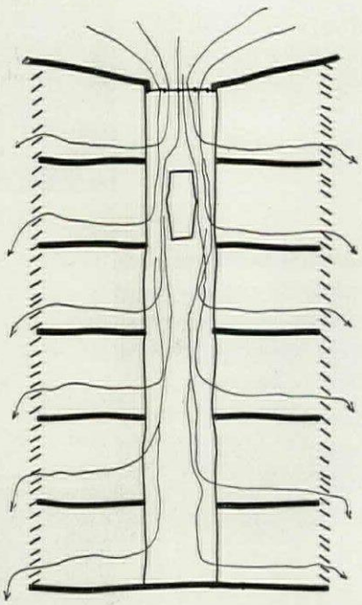
Stillwater School, Okla., Caudill, Rowlett, Scott & Associates, Philip A. Wilber, Architects





In first scheme wind rushed to the end of hall and ventilated only far classrooms.



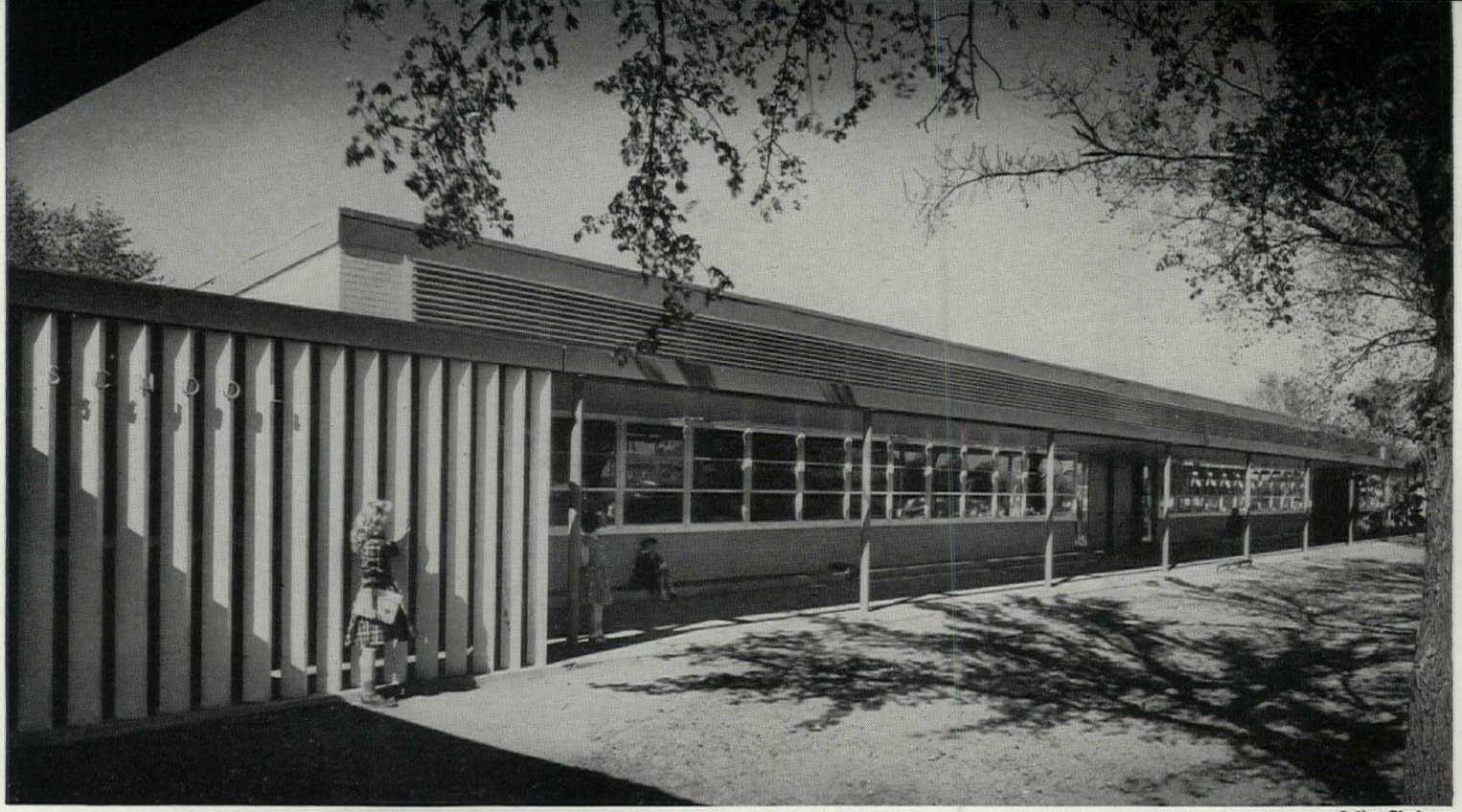


Office block kills some of wind's inertia and ventilates classrooms equally.

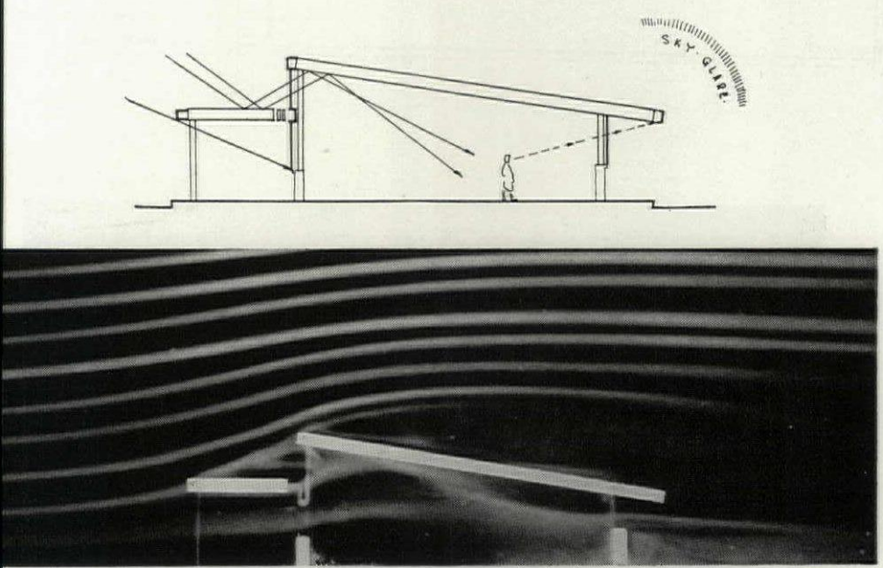
Planning in the Wind tunnel

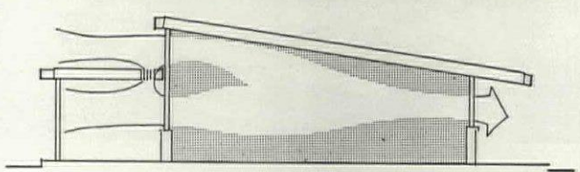
When Caudill, Rowlett, Scott & Associates first made sketches for an Elk City, Okla. school, they were very conscious of a serious ventilation problem over much of the school year. To be sure that the natural air movement would be utilized they made a trial design (plan left) which pointed a wide central hall directly at the prevailing wind. The idea was to scoop it in, then send it through the classrooms, aided by suction areas which would naturally occur outside. Sketch of transverse section shows how air is admitted low from hall to classrooms to move directly across seated students. On paper the plan looked good.

But then they put it to the test and found that it was too good. At normal velocities the wind was scooped into the big hall, and swept to the end to the far classrooms—and did not circulate through the near ones at all. The solution: still funnel the wind at maximum velocity into the building, but once the flow has started break it up in the hall sufficiently to assure equal distribution throughout all classrooms. The method: put a needed office block near the mouth of the "wind tunnel" hall. This is the way the building will go up, with confidence bought at a minor cost for building models.



Julius Shulman





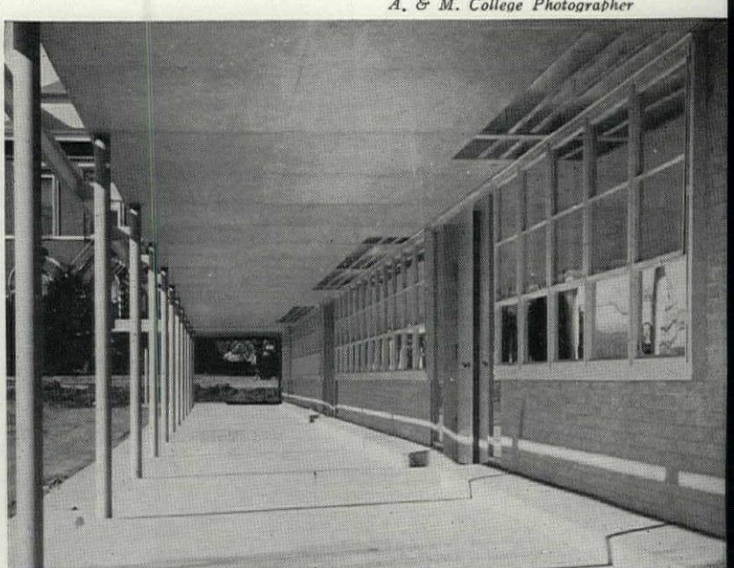
ELEMENTARY SCHOOL, Blackwell, Okla.
CAUDILL, ROWLETT, SCOTT & ASSOCIATES, Architects

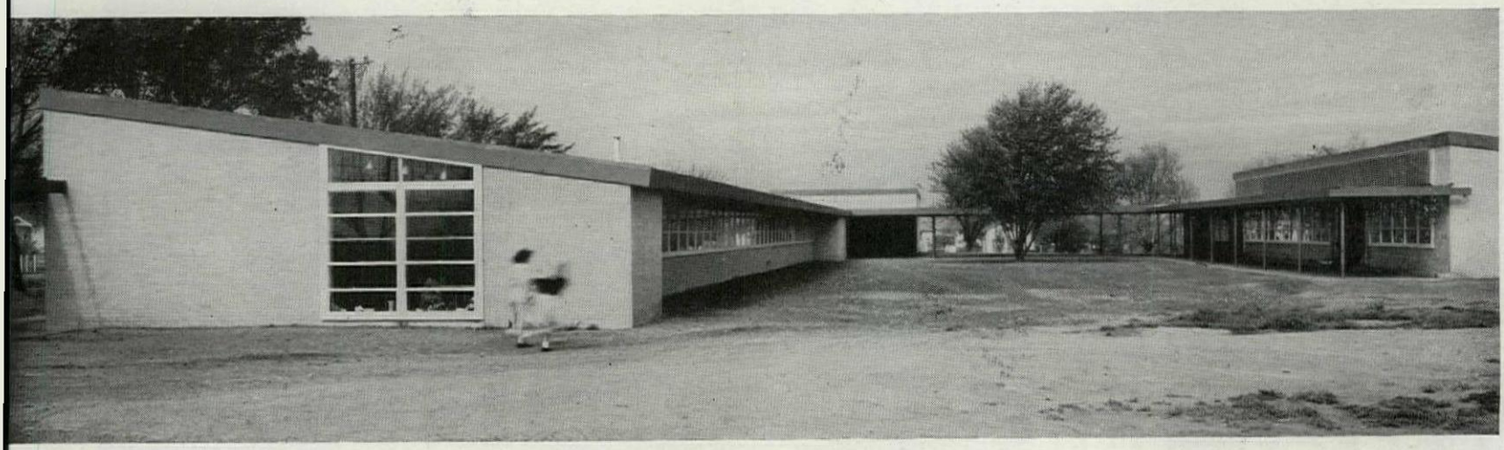
Applied research

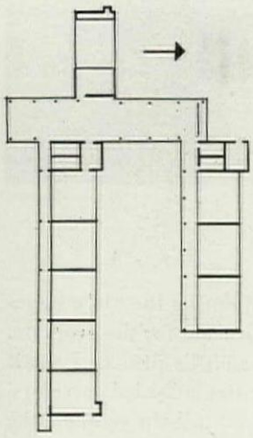
This school, designed and completed during the early stages of the Texas testing, stands as an advocate for the program. One of a similar pair put up by Caudill's firm in a small Oklahoma town, it has a U-plan and single-loaded corridors, which were left open for economy and to help ventilate the classrooms. (By not enclosing the halls, the architects saved enough money on each 12 classrooms to add 2 more classrooms. Climate favored the plan; so did the state educational authorities, who said need for enclosed halls was minor in elementary schools where pupils occupy same classroom all day.)

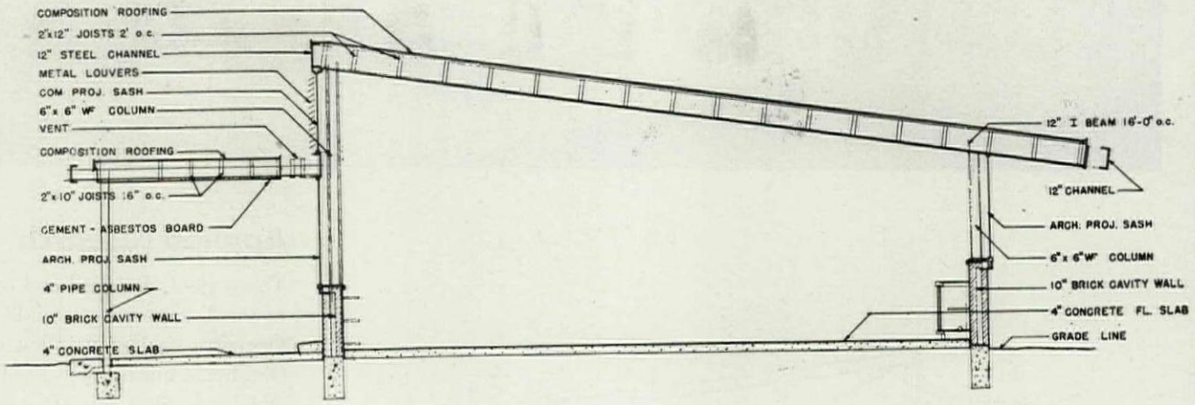
Good natural light distribution and absence of glare, is shown in diagram, left and in photographs. When model was first put in wind tunnel to predetermine ventilation, the expected did not happen. Air current from high window over canopy failed to enter building, as predicted, but eddied up and rolled down roof outside. This was solved by putting a slot in the canopy next to the building, and equalizing pressure. (See photo.)

A. & M. College Photographer









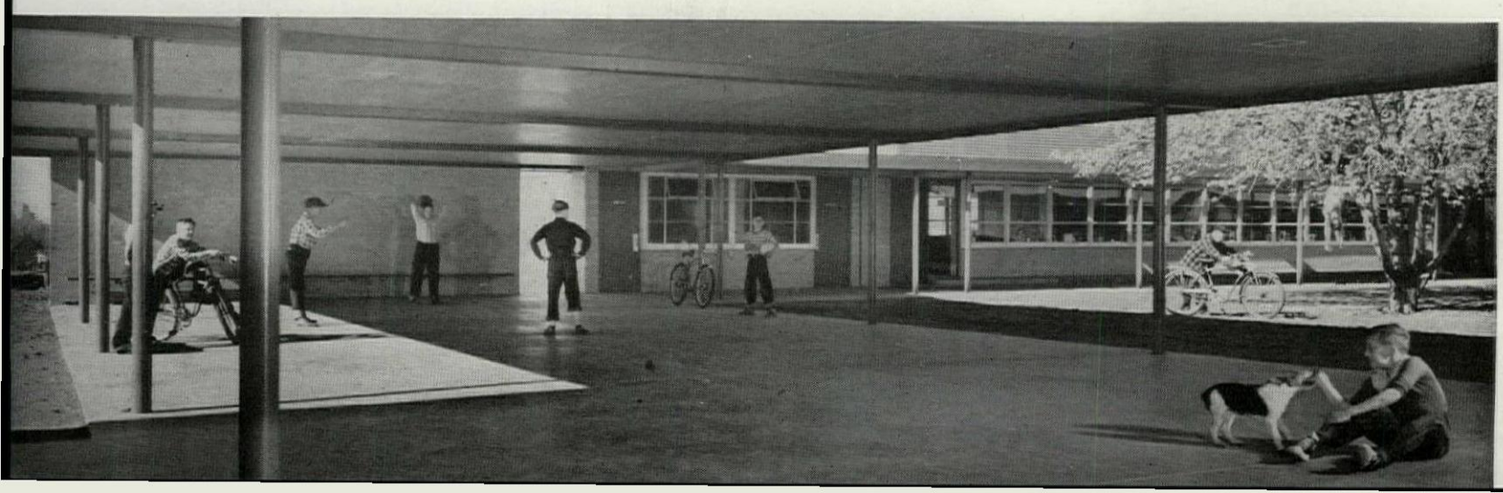
Photos: Julius Shulman

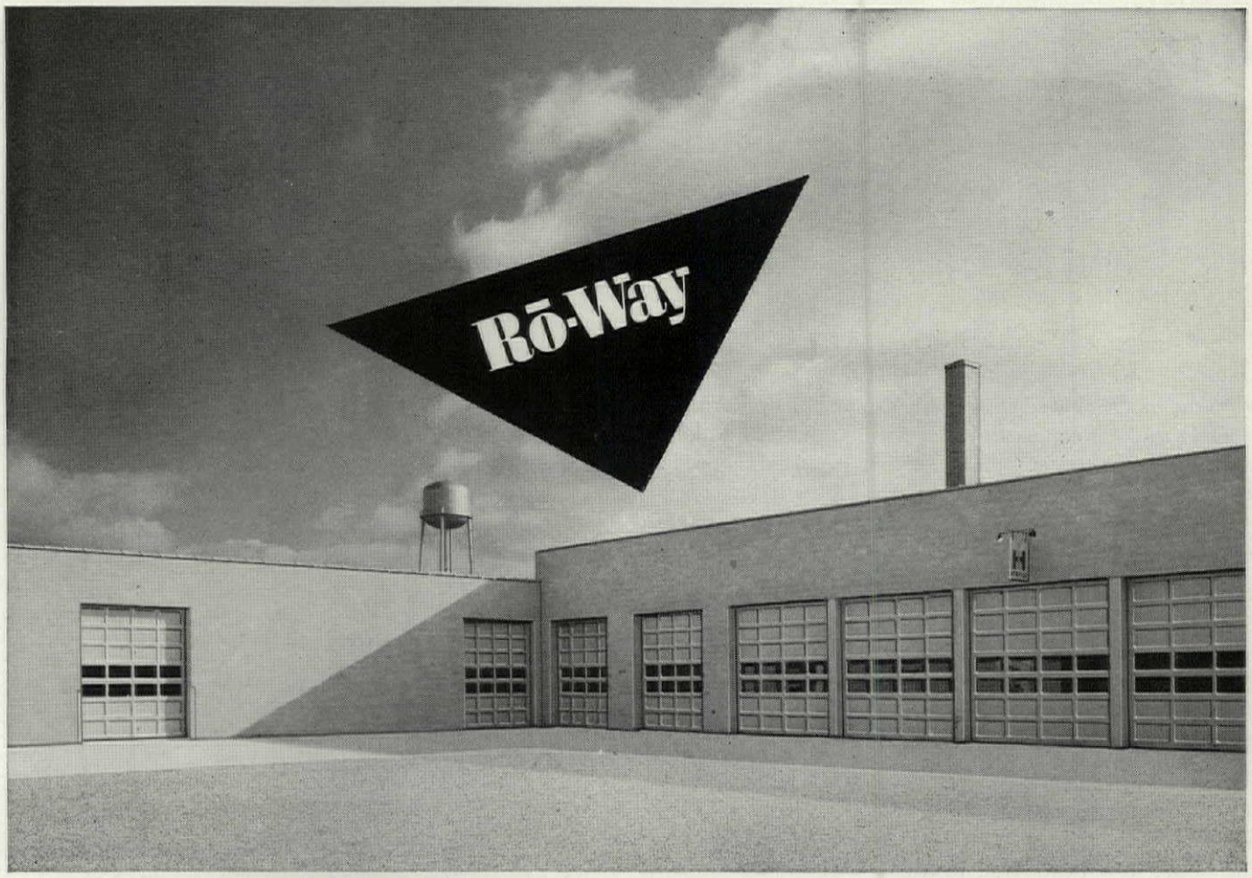
Plan, diagrammed above left, shows two wings of classrooms with toilets at start of wings. Play shed links these wings with auditorium. Two similar schools were built in the small town.

Freestanding "teaching center" is in each classroom, with space for coats and storage behind, tack and chalk board mounted on it.

Big play shed connects classroom wings, is open on three sides and paved for protected outdoor play when rain churns Oklahoma soil into mud. Single wall is shield against winter wind.







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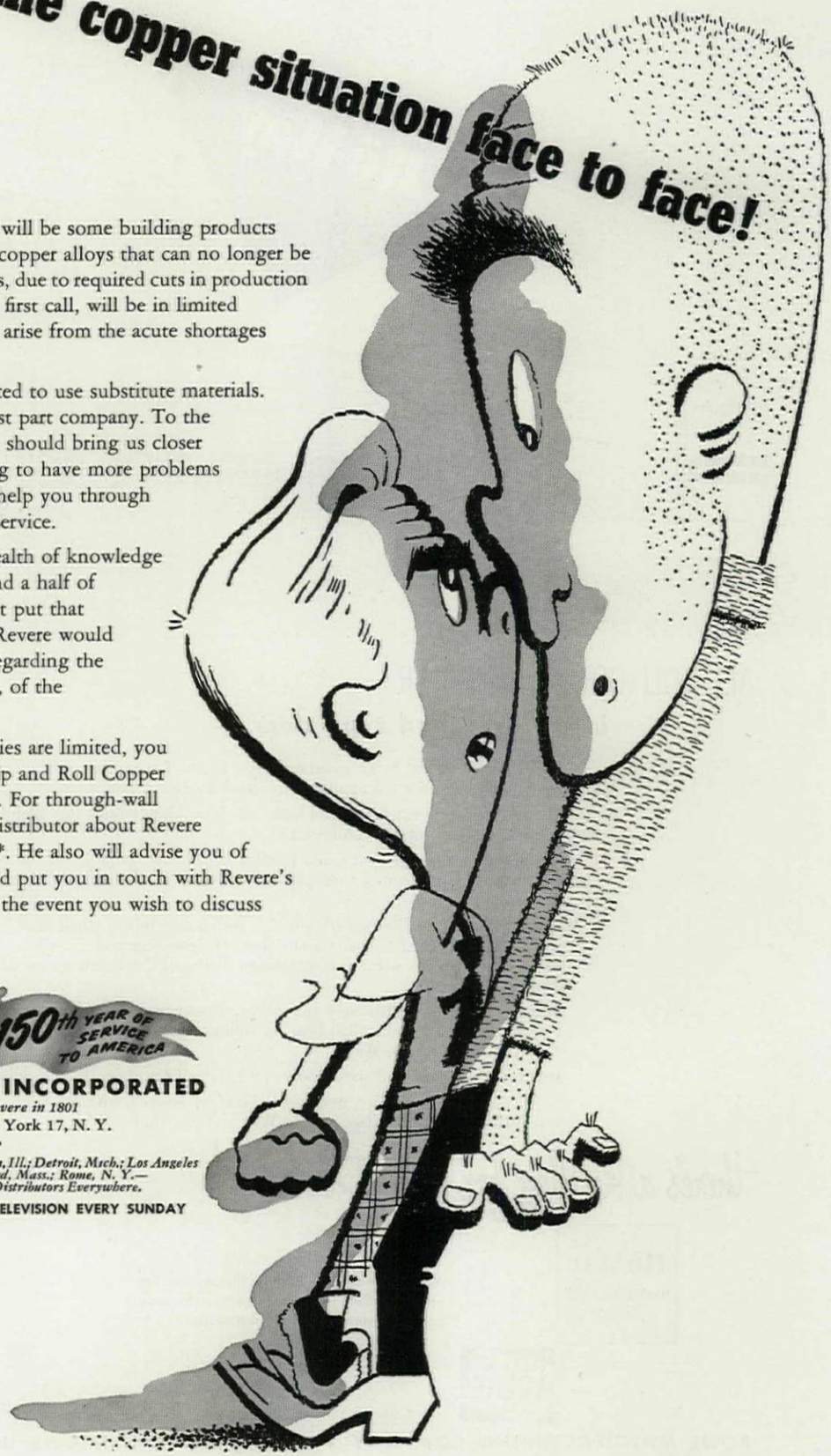

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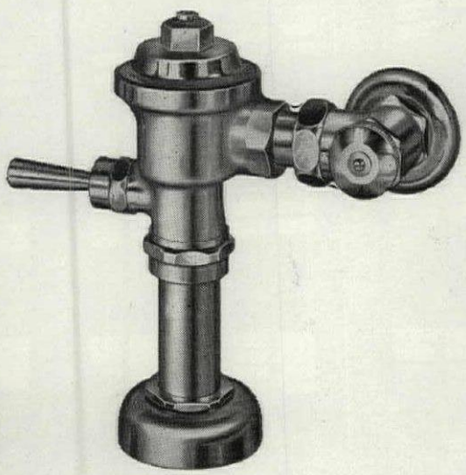

On all DELANY valves, an unnecessarily long flushing cycle may be reduced by the twist of a screw driver (left). This flexibility allows for all job site variables of pressure and volume. It is noteworthy that the DELANY Valve is the only diaphragm type with this positive setting, permanently free-turning and without watch-like moving parts subject to fouling.

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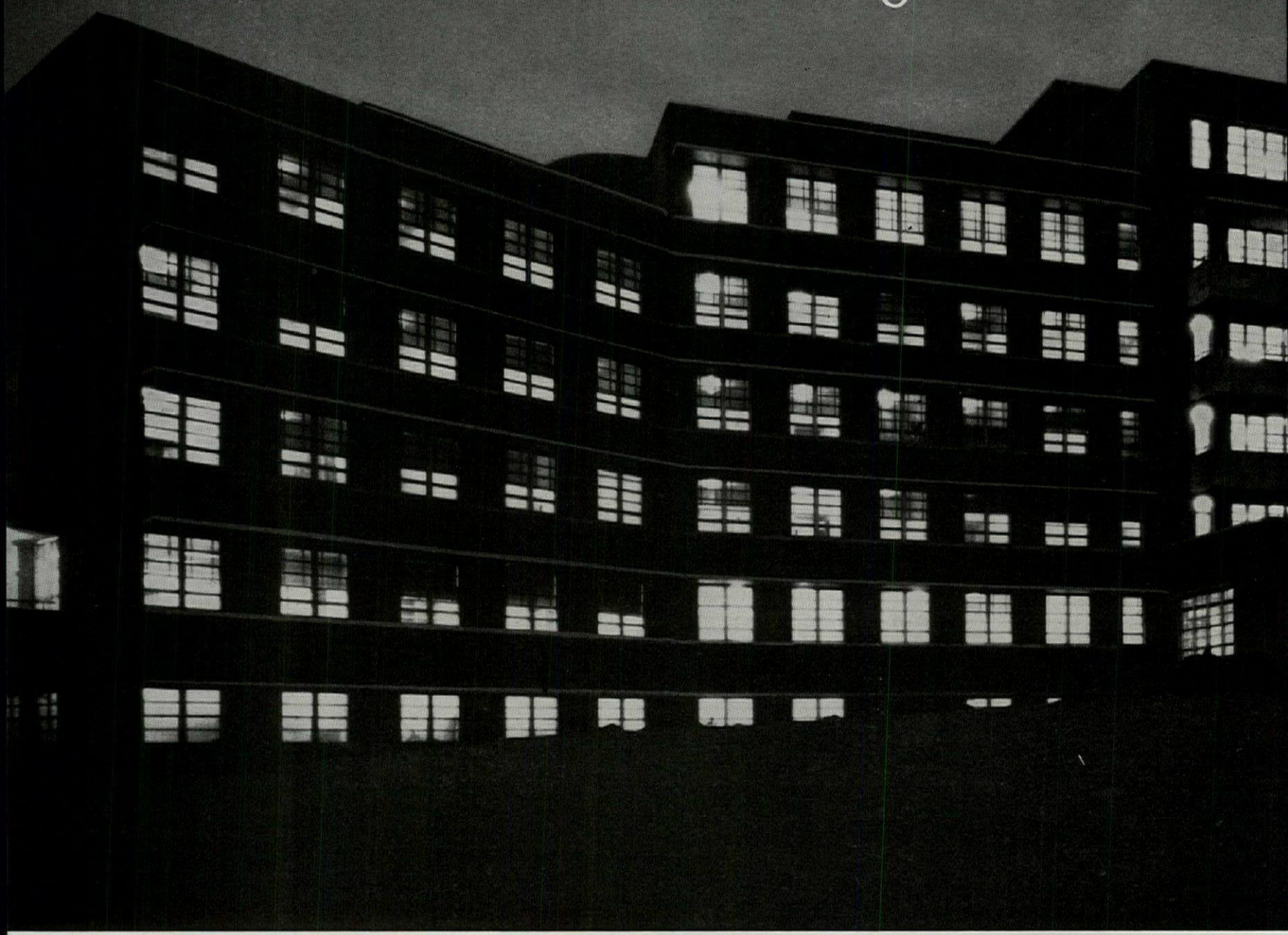
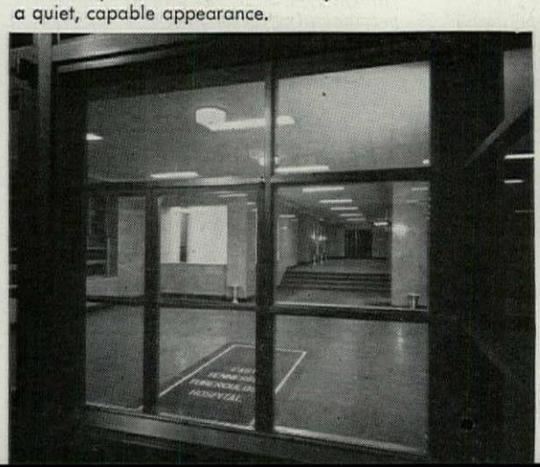
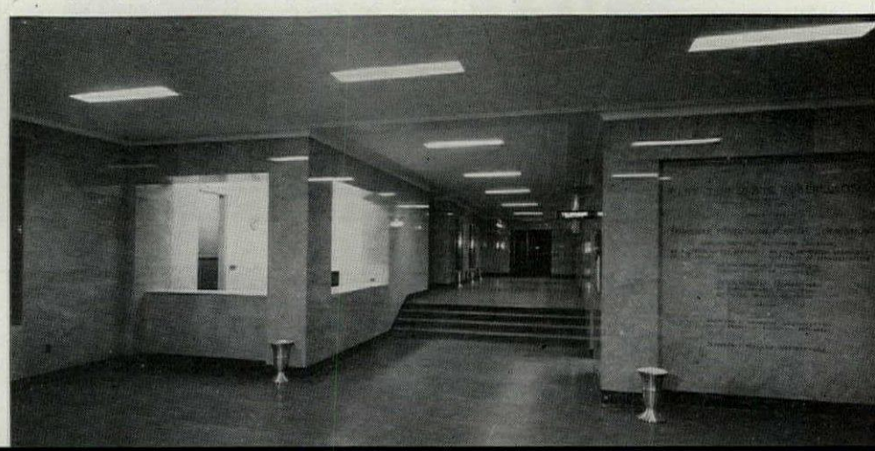


From the port-cochere, the interior presents a quiet, capable appearance.



The simple dignity of the entrance hall is lighted by glareless Day-Brite glass enclosed troffers.





Left to right:
Shi G. Goodwyne,
Albert B. Baumann, Jr.,
Will W. Griffin.

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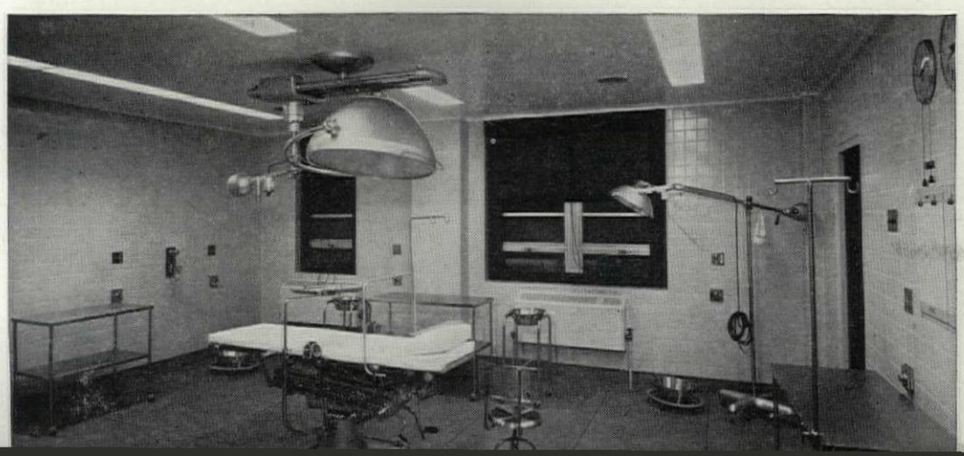

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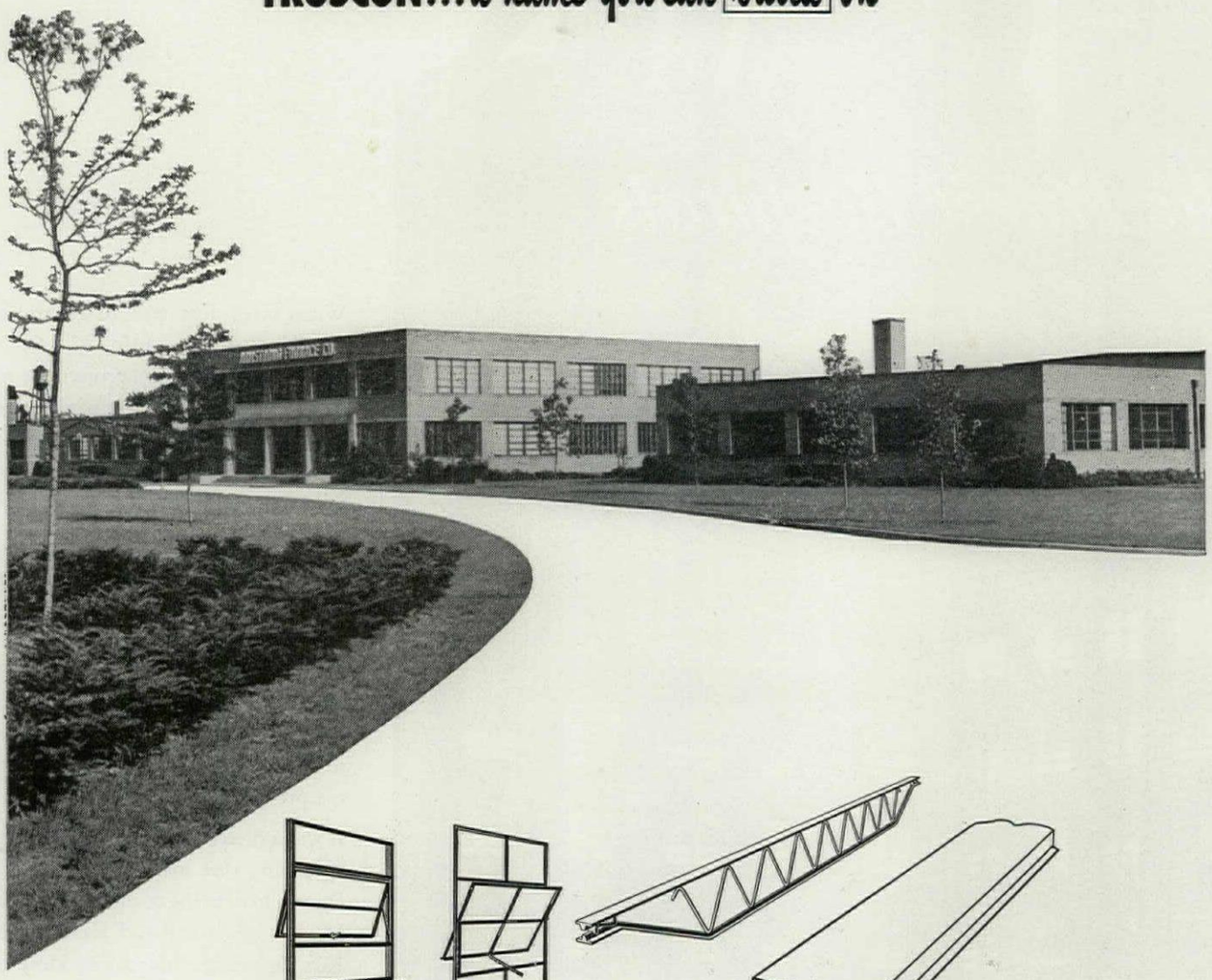

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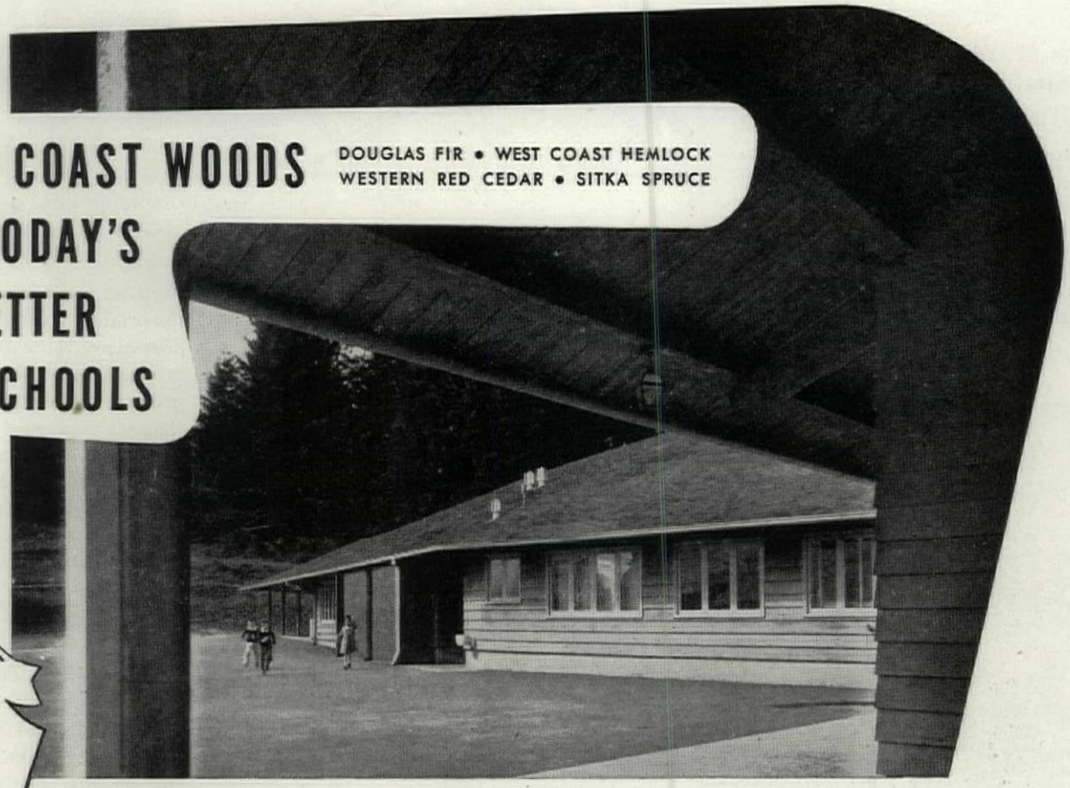

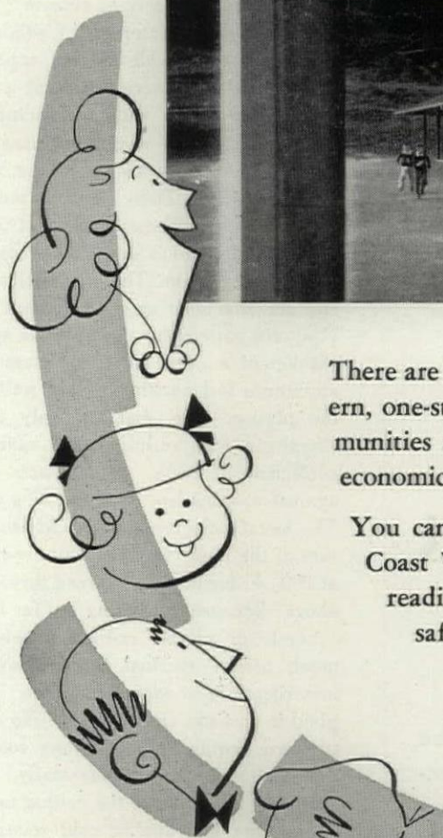

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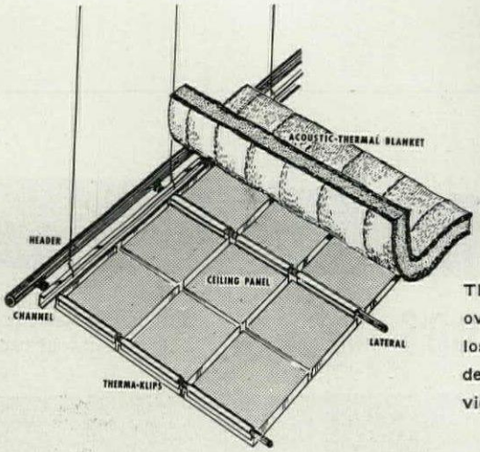
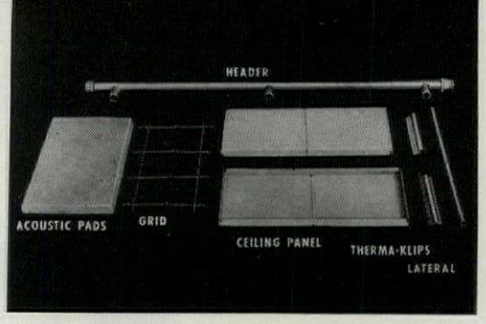
During hot weather the ceiling may be utilized for cooling by running cold water through the pipes. The panel then will act as an absorptive blotter for the heat at a cost below regular air conditioning. (See *Panel Cooling*, THE MAGAZINE OF BUILDING, April '51). If individual acoustic pads are used instead of an overall blanket, and space is provided between the pads and pans, the ceiling area can function as a plenum chamber for draftless ventilation through the perforations—with or without air conditioning. Air conditioning engineers advise that for this type of application the heating system be apart from the forced ventilation, maintaining that ventilating air should be introduced at about 60° F. for comfort and this temperature would fight the heating system by cooling the panel surface. Where the ceiling is to be used for heating alone, unperforated pans are available. However, the perforations make very little difference in the performance of the ceiling as a radiant panel, and should be

(Continued on page 192)





The combination acoustic-heating ceiling at left uses an overall thermal blanket as protection against upward heat loss and to absorb sound. Where draftless ventilation is desired, acoustic pads (pictured above) on top of individual grids in the pans replace the blanket.



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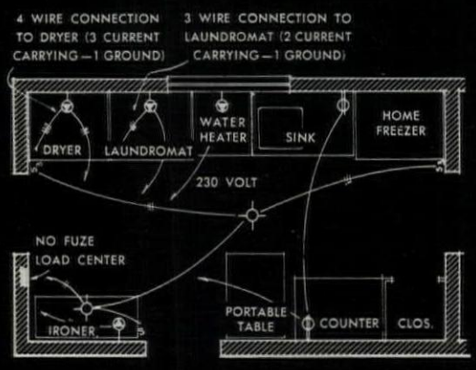
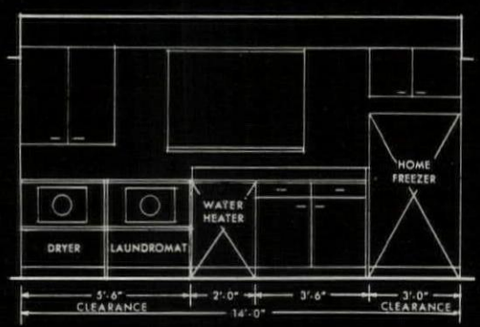
DESIGN DETAILS

PLATE 3

PLANNING A LAUNDRY–HOME FREEZER ROOM





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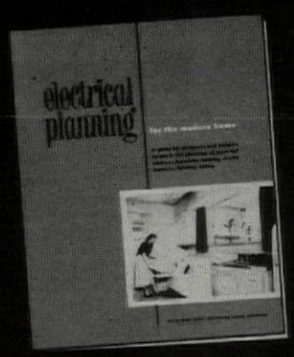

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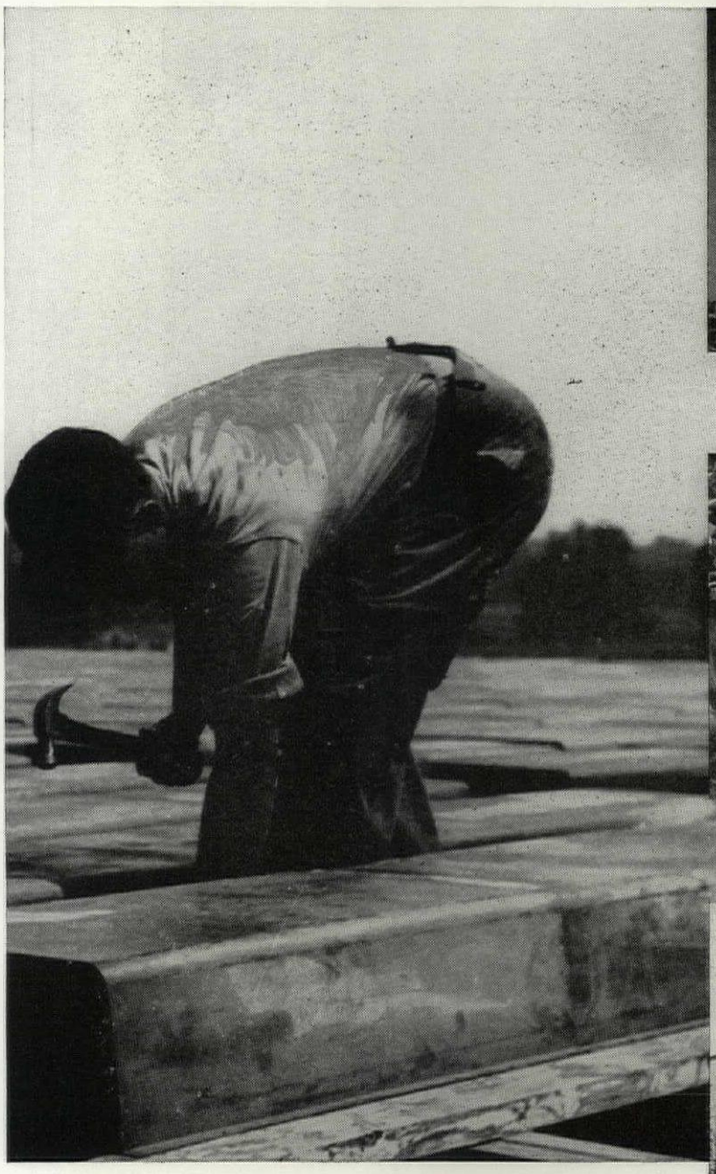
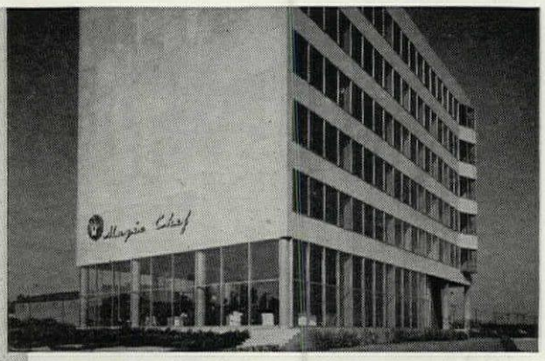
Saves men because less time and labor are required in providing open wood centering and form work.

Saves money by saving concrete . . . the "dead load" is kept at a minimum. Too, less lumber is needed. Removable steelforms can be reused: thus only a nominal rental fee is charged.

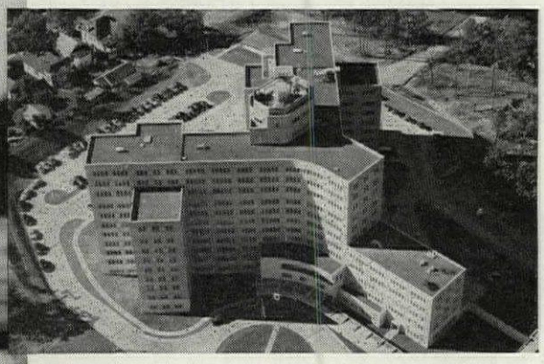
CECO STEEL ®

In construction products **CECO ENGINEERING**

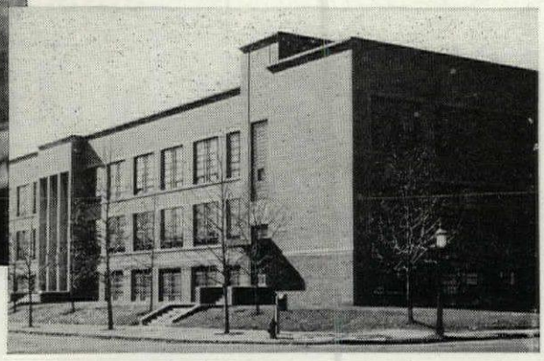




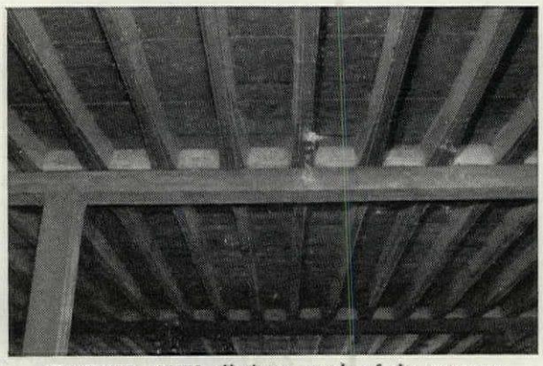
INDUSTRIAL BUILDINGS — Ceco's Meyer steelform method speeds construction: the simple skeleton centering goes up fast; the forms are quickly placed and removed by unskilled labor.



HOSPITALS—Ceco Concrete Floor Joist Construction is ideally suited to hospitals since it provides fire-safe, sound-proof buildings at economical cost. Widely used in Veterans Hospitals.



SCHOOLS—Safe, low-cost construction is assured: concrete is kept at the minimum required for the live load. Saving in dead load reduces costs throughout the structure.



CONCRETE JOISTS eliminate much of the concrete below the neutral axis, saving money, saving material. Suited to buildings with long spans: stores, offices, apartments, hotels.

Concrete Joist Construction

Saves material because only a minimum of critically short steel is needed. Less concrete is necessary than required by other concrete floor constructions.

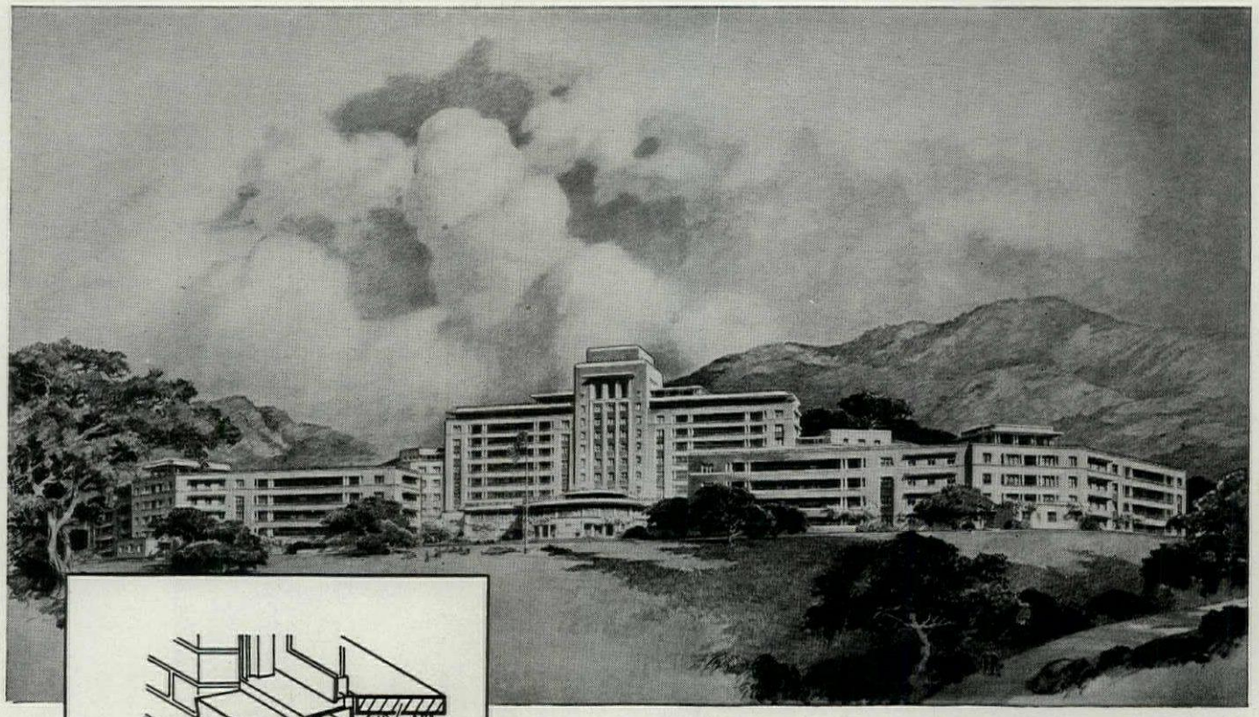
Ceco originated the removable steelform method of concrete joist construction. The company is first in the field—providing more services than all competitors combined. So call on Ceco . . . the leader over all.

CECO STEEL PRODUCTS CORPORATION

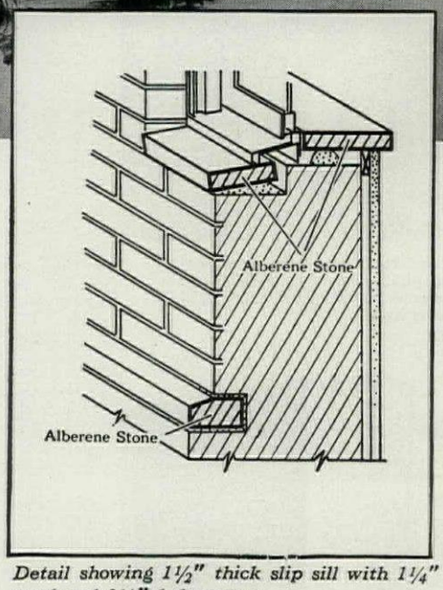
General Offices: 5601 West 26th Street, Chicago 50, Illinois

Offices, warehouses and fabricating plants in principal cities

makes the big difference



Tripler General Hospital, U. S. Army Medical Dept., Hawaii — Architects: York and Sawyer, New York City. 1½" Alberene slip sills.



Detail showing 1½" thick slip sill with 1¼" stool and 2¼" belt course.

sills, stools, and trim of ALBERENE stone are DURABLE and ECONOMICAL

Regular Grade Alberene Stone is an ideal material for exterior trim because it can be cut into thin sections, permitting substantial economies. It offers freedom to the designer—by making possible greater reveal, to give just one example.

The stone has no cleavage planes, is dense, non-absorbent, and chemically-resistant. It is free of maintenance cost. Its color—silver gray in rubbed finish and a pleasing blue gray when honed—harmonizes well with almost any color scheme.

Where a darker color is desired, we suggest Alberene Serpentine. It is a darker gray in rubbed finish, blue-black when honed, and blue-black or black when polished.

The high chemical resistance of both stones, which has made them favorites for use in laboratory equipment, also makes them ideal for *window stools* in laboratory buildings.

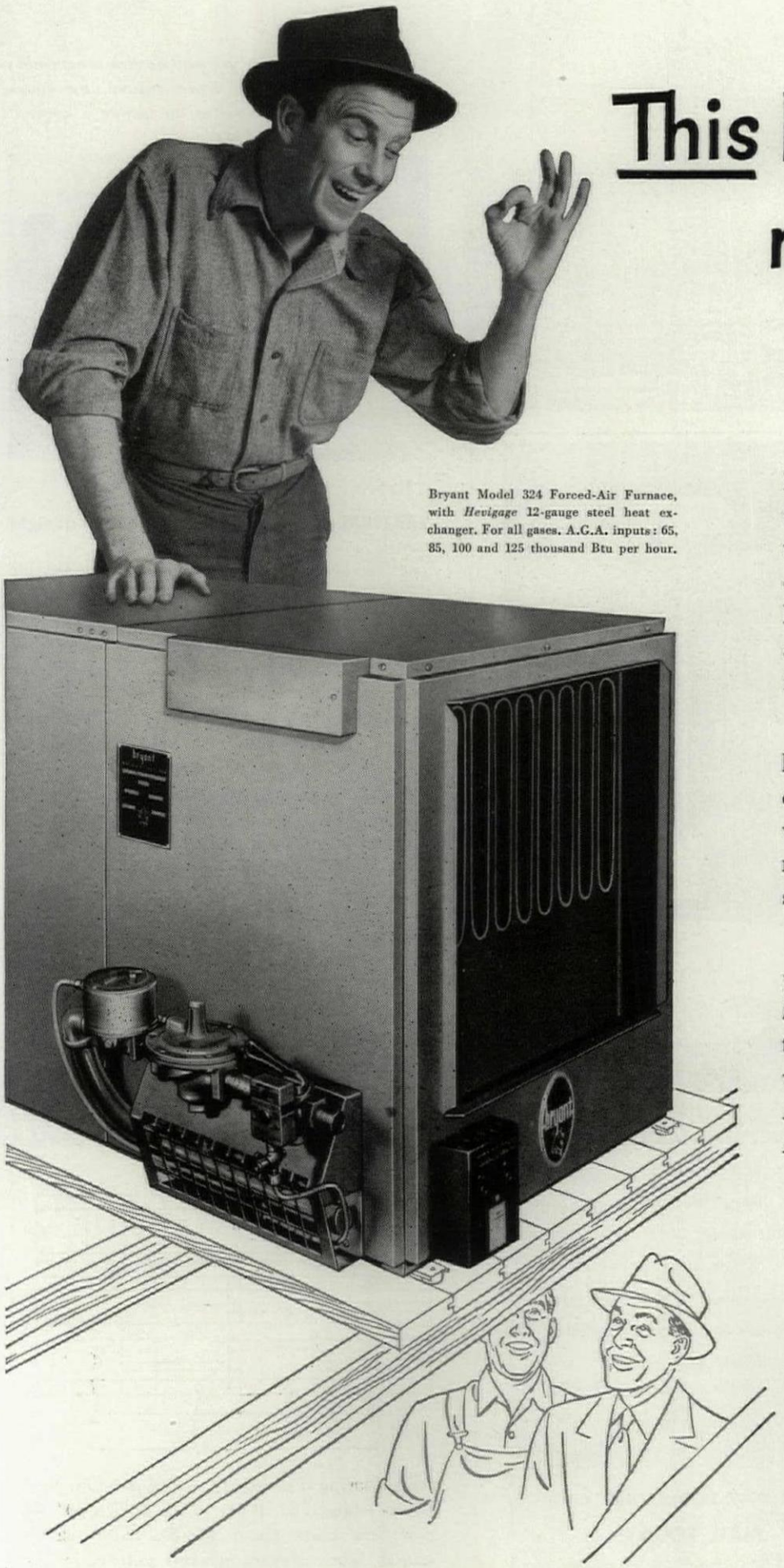
Since there is a decided difference in price between Alberene *Regular Grade* and *Serpentine*, architects' specifications should be carefully worded so as to clearly call for the type desired. Ample supplies of both materials are available.

ALBERENE STONE CORPORATION

419 Fourth Avenue, New York 16, N. Y.

Branches in Principal Cities

This heating unit sells more *living* room



Bryant Model 324 Forced-Air Furnace, with *Hevigage* 12-gauge steel heat exchanger. For all gases. A.G.A. inputs: 65, 85, 100 and 125 thousand Btu per hour.

A truly great space saver like the Bryant *Hide-away* Gas Forced-Air Furnace adds real value and *appeal* to a house. It can be tucked away in the attic or suspended from ceiling or under the floor, releasing for storage, utility or *living* all the valuable space usually occupied by conventional heating equipment!

The *Hide-away* offers typical Bryant dependability and gas economy, with positive automatic control. Casing temperatures are *low*. Installation-wise, you get ease of handling, and structural steel mounting channels provided can also be used to suspend the unit when it is so installed.

Plan more *living* space and better *heating* for your homes at the same time. Plan to use the Bryant *Hide-away* Forced-Air Furnace! For complete details, contact the Bryant Distributor nearest you or write direct. Bryant Heater Division, Dept. 102, Affiliated Gas Equipment, Inc., 17825 St. Clair Avenue, Cleveland 10, Ohio.

Let the pup be furnace man ... and water boy, too!

bryant

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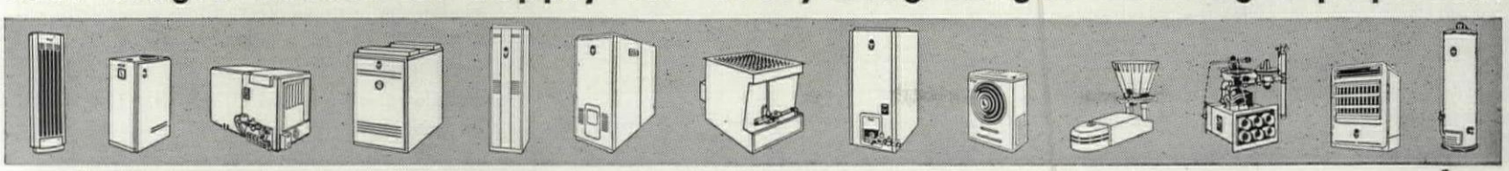
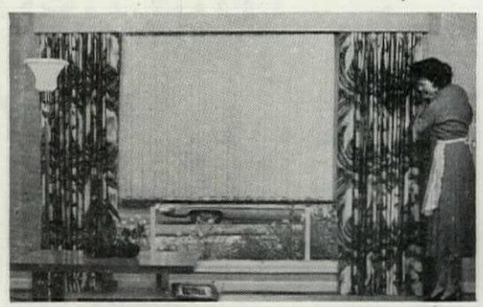
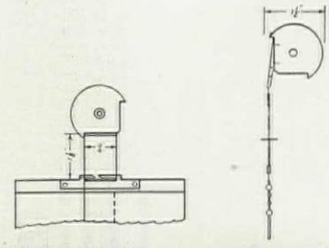
Your *single* source of supply for everything in gas heating equipment!

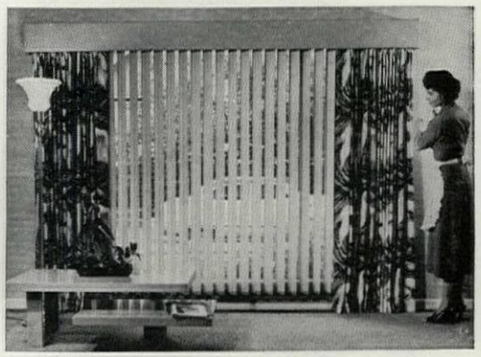


used where a future need for an acoustical ceiling is contemplated. As easy to take apart as to rig together, a portion of the ceiling can be dismantled readily for access to building services above. Costs run about $2 to $3.50 per sq. ft. depending on the thickness of insulation used, the heat required, and structural factors involved. Local contractors can handle the installation and the manufacturer will give technical advice.
Manufacturer: Burgess-Manning Co., Libertyville, Ill.



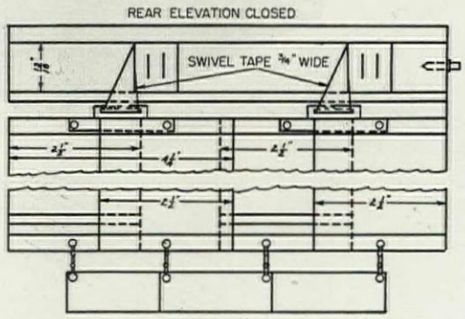


The sleek lines of the vertical louvers complement contemporary settings. When desired, the entire window blind can be rolled up behind a cornice.



VERTICAL WINDOW BLIND rolls up out of sight

The Verti-blind window covering offers flexible light control, unobstructed vision when open, and complete privacy when closed. Not only can the louvers be turned to reflect daylight at an angle in a 180° arc, they also can be closed (parallel to the window glass) and rolled up to any height like a window shade. The 4¼″ wide vertical vanes are made of a plastic impregnated fabric that is said to withstand fading, cracking, shrinking and stretching. They are spaced 3½″ apart along a pole which slips into a pair of brackets. As the pole is turned on its horizontal axis, the louvers rotate on their vertical axes. The vertabra-like mechanism is regulated by a single endless length of bead chain. Made to order in any of 12 colors, or in color combinations, the blinds are shipped assembled ready for mounting. Installation is said to be simple and rapid. Each bracket is attached to the casing with two screws. The blinds may be mounted from the back, at the side, or suspended from above. The front of the brackets has a keyhole slot for mounting a cornice. The bottom of the blind hangs free but tie back loops are provided

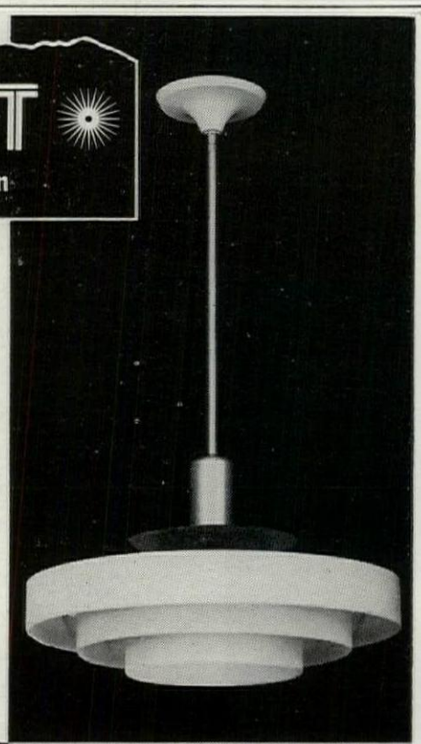


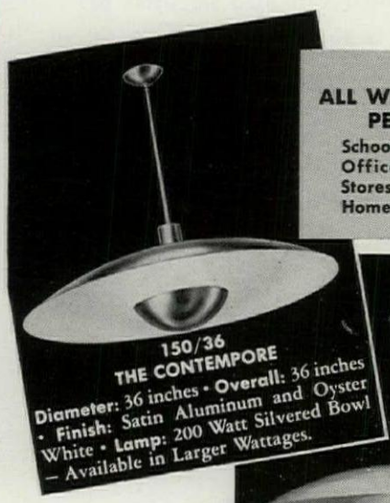
for anchoring if necessary. Retail price for Verti-Blinds is about $1.10 per sq. ft. A 28 x 60″ window size costs about $13.20. Although the smooth fabric surface remains practically dust-free, the blinds may be washed whenever desired with a soap and water solution. Not limited to window applications, Verti-Blinds may be utilized as doorway and room partitions and as show window backdrops.
Manufacturer: Vertical Blind Mfg. Corp., Box 46, Geneva, Ill.

(Continued on page 198)

LITECRAFT
the quality line of superior design

One of your many obligations to clients, is to provide superb lighting performance at the most modest possible price. Such performance, coupled with true beauty, are yours to recommend in fixtures by Litecraft — creators and fabricators of low-priced, high-quality lighting equipment.





ALL WAYS PERFECT FOR
Schools, Hospitals, Office Buildings, Stores, Showrooms, Homes.

150/36 THE CONTEMPORE
Diameter: 36 inches • **Overall:** 36 inches • **Finish:** Satin Aluminum and Oyster White • **Lamp:** 200 Watt Silvered Bowl — Available in Larger Wattages.



151/36
Diameter: 36 inches • **Overall:** 36 inches • **Lamp:** 300/500 Watt Silvered Bowl Lamp-other wattages available • **Finish:** Rings and inside dome, Perma-White • **Top Dome:** Oyster White • **Stem:** Canopy and Husk-Satin Aluminum



153/28 THE MODERNA
Diameter: 28 inches • **Overall:** 28 inches • **Lamp:** R-30 or 100 Watt "A" • **Finish:** Satin Brass and Oyster White.

106 CONCENTRIC LOUVER UNIT
- Low Brightness—High-Efficiency
- Sturdy Construction
- Negligible Maintenance
- No Spot Welds—Tough Finish
- Rings Turned in for Added Rigidity
- Underwriters Laboratories Approved
- Lamp: 300/500 watt Silvered Bowl Lamp-other wattages available
- Standard Finish: Rings—Perma-White Stem, Canopy & Husk—Satin Aluminum

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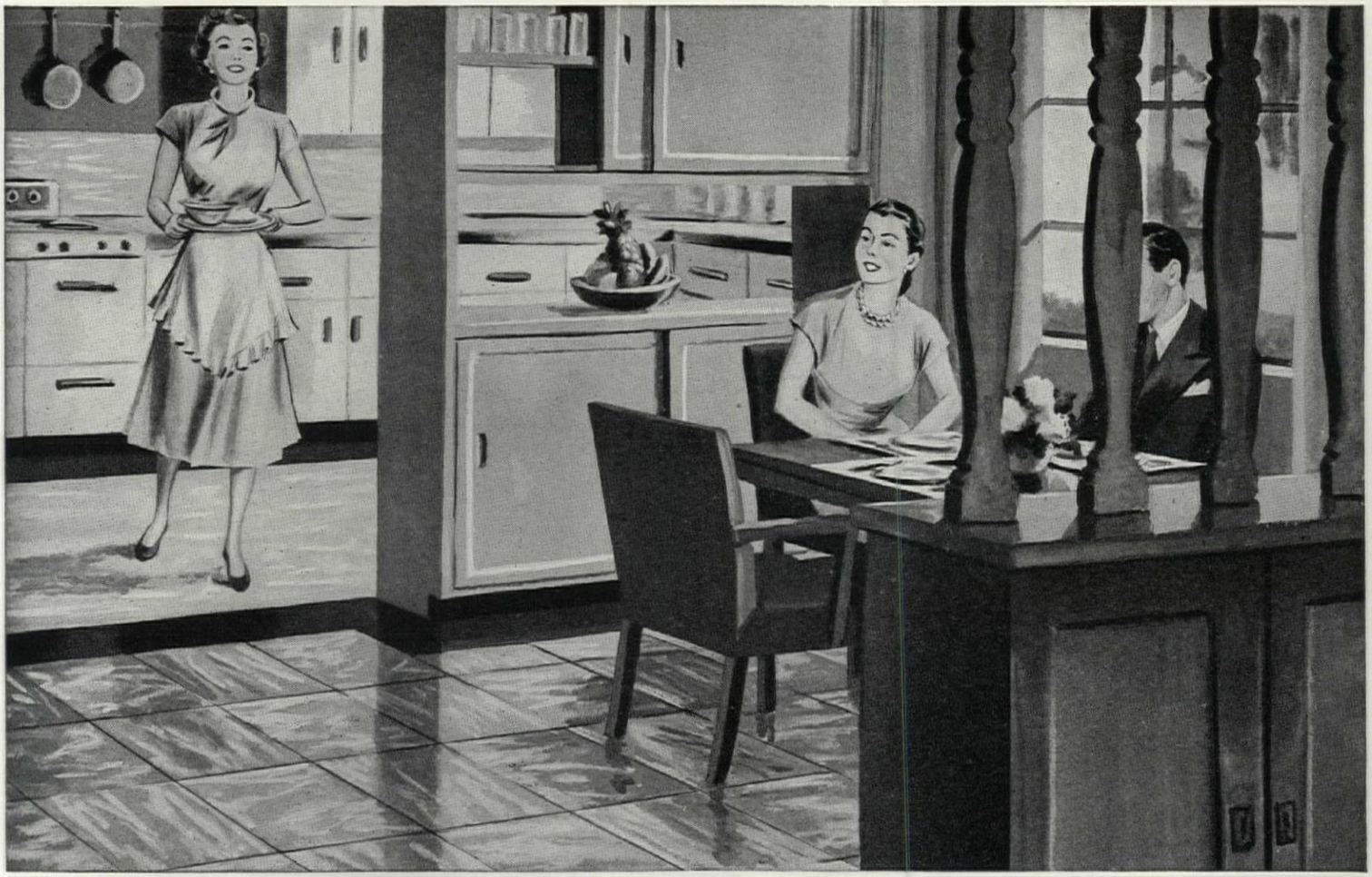
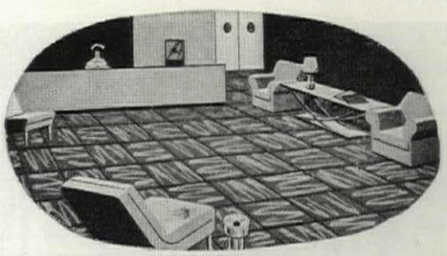
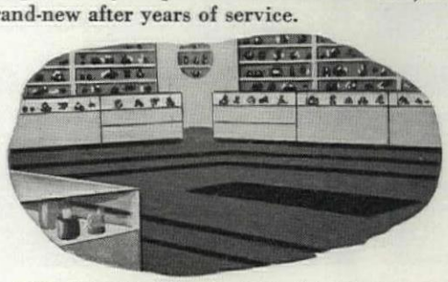


Specify with confidence

THE WORLD'S MOST BEAUTIFUL FLOORING



CLIENT SATISFACTION ASSURED when you specify Wingfoot Vinyl, the flooring that is impervious to the action of greases, fats, oils, mild acids, commercial cleansers, waxes. Truly a remarkable flooring, Wingfoot Vinyl requires a minimum of care, looks brand-new after years of service.



EASY TO INSTALL, Wingfoot Vinyl is ideal for showcase jobs. Its wide choice of appealing colors lends itself beautifully to "personalized" floors of your own original design. It is particularly adaptable for residential use.

FOR rich, warm, lovely wall-to-wall floor covering that costs much less than carpeting—for flooring that defies time and wear, retains its beauty after years of service—flooring that will delight your clients and enhance the beauty of any home or personal office you design—*Specify Wingfoot Vinyl, Goodyear's new, all-Vinyl flooring that keeps its brand-new look under years of severe service.*

RAINBOW RANGE OF SUPERB COLORS

Raymond Loewy Associates have styled, exclusively for Goodyear, a complete range of attractive correlated colors—either solid or tone-on-tone—to blend perfectly with fabrics, draperies, any wall decor. Colors that defy fading, "walking off," scrubbing off, because they're built right into the wearing surface.

Clients will appreciate the styling, the beauty, the *economy* of Wingfoot Vinyl Flooring. Specify it and have your clients see it. Available in either sheet or tile, at flooring dealers' and contractors' everywhere. For specification data, write to Goodyear Flooring Department, Akron 16, Ohio.

WINGFOOT *Vinyl* **FLOORING** { SHEET AND TILE

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Wingfoot—T. M. The Goodyear Tire & Rubber Company, Akron, Ohio

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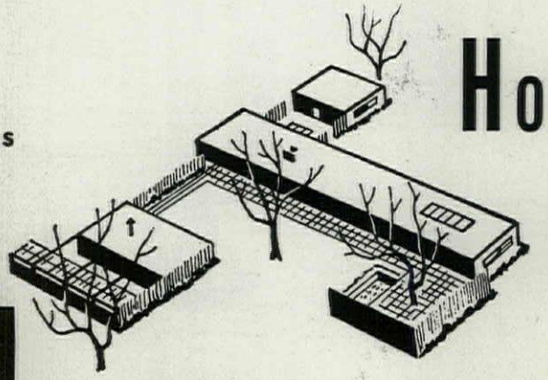
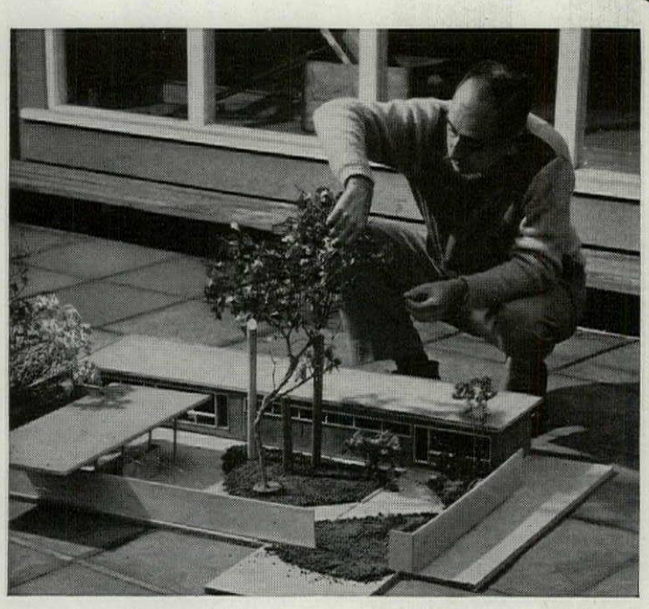


HOLIDAY HOUSE

a modern year-round vacation home!

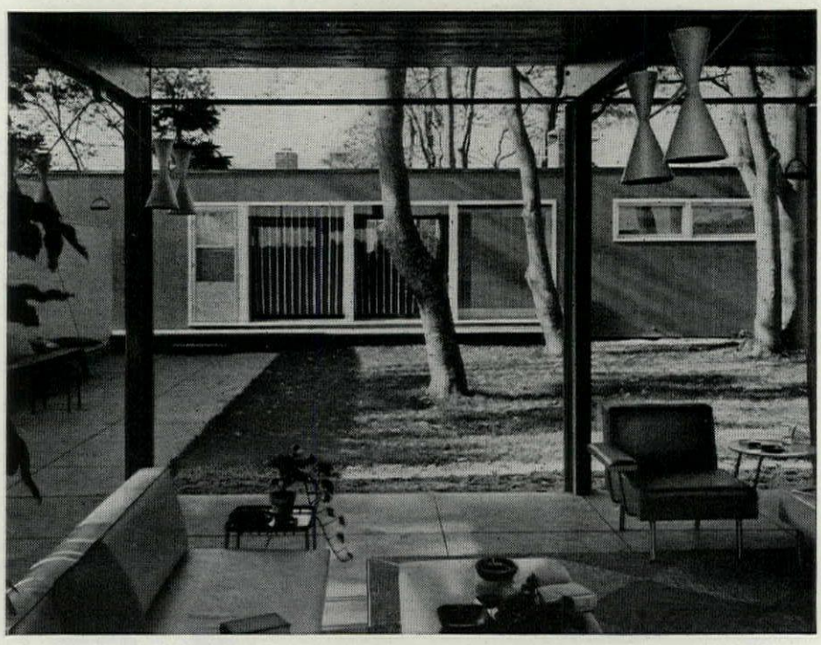




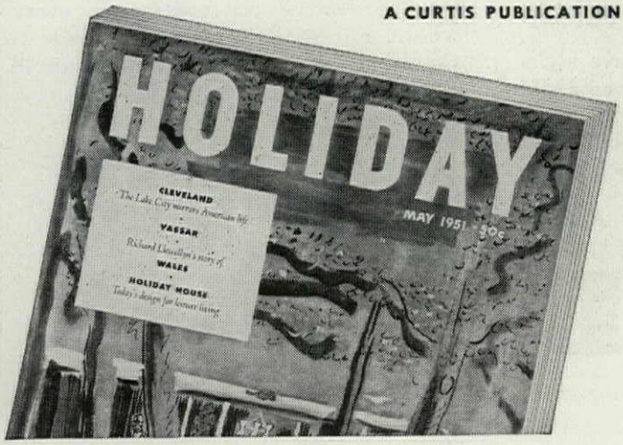
● Here's an exciting new adventure in living—a modern year-round vacation house sponsored by Holiday—the magazine of people, places and pleasure.

Designed by George Nelson, Holiday House is a perfect expression of a long-standing Holiday point of view—that home should be an inviting haven rather than a hatrack, a relaxing refuge and not just a roof.

Read all about Holiday House—24 pages of exciting new ideas, products and innovations that will appeal to you and Holiday's ¾ million active, high-income families. Get your copy of the May issue of Holiday—on newsstands now.



A CURTIS PUBLICATION



HOLIDAY means Pleasure

and Pleasure means Business

1818 HOPE'S 1951
SCHOOL WINDOWS



Archbishop Williams High School, Braintree, Massachusetts
Maginnis and Walsh, Architects *Walsh Brothers, Contractors*

Hope's Intermediate Projected Windows, set into Hope's "Biltin" Subframes, were used in the fenestration of this splendid, modern school building.

It is clear from looking at this pleasing exterior that the class and study room interiors are most successful, with ample daylighting of all desks and restful distant vision for the eye's relief from the strain of close work.

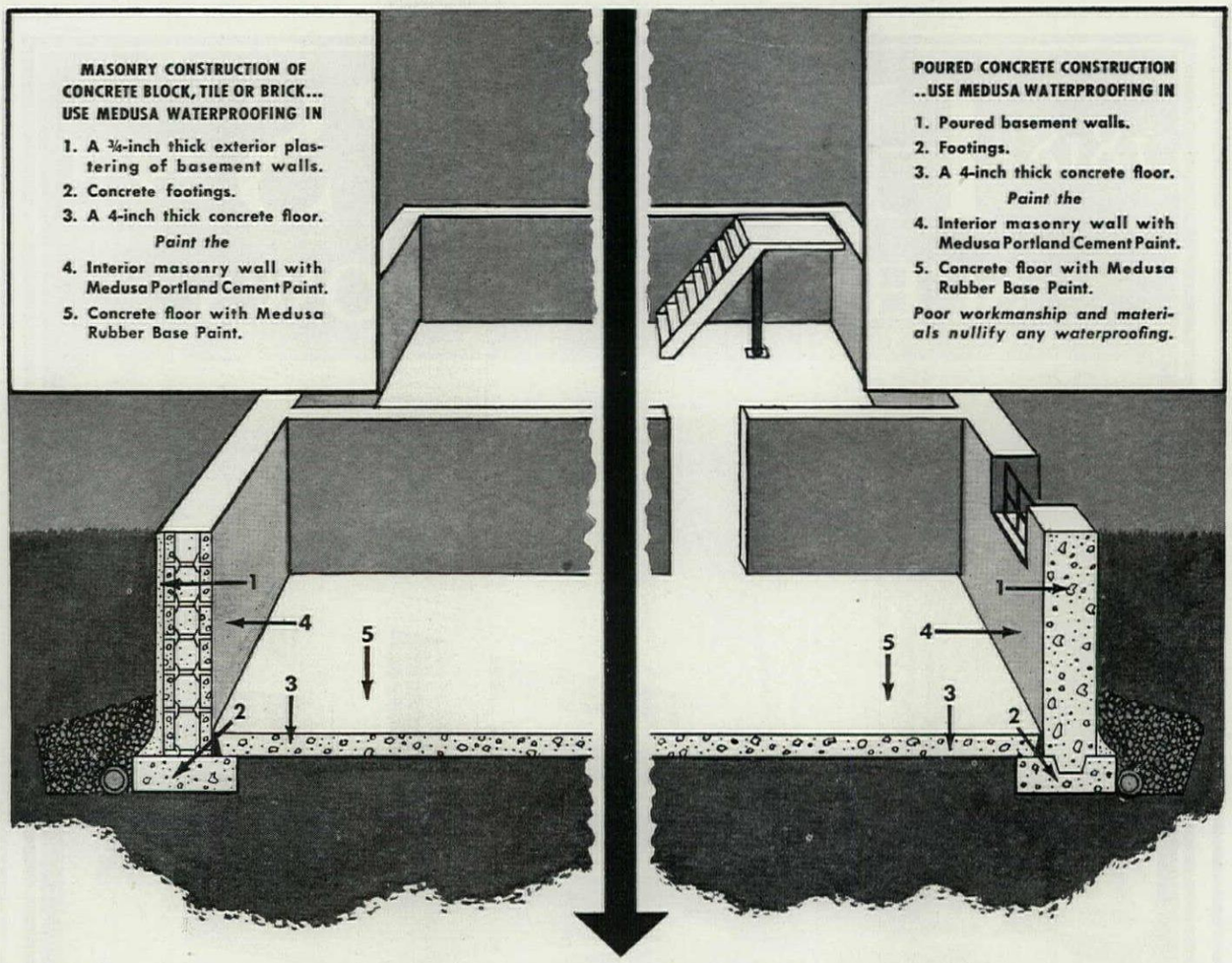
Hope's Projected Windows also give control of natural ventilation with fresh outdoor air in warm weather. The name "HOPE'S" guarantees lasting convenience of operation and satisfaction for the whole life of the building.

Outstanding advantages are afforded by the use of Hope's "Biltin" Subframes. As in this case, these subframes may be so designed that the windows are nearly in the same plane as the building's exterior face, providing extra space inside for the installation of heating, ventilating and conditioning apparatus. Inside, they make possible a wide ledge or counter at sill height which is also useful in other types of buildings.

The use of "Biltin" Subframes gives the architect a far wider choice in design possibilities. Study of the photograph shows how the continuous, ribbon-type frames serve more than one room, with the interior partitions abutting on the wide, hollow metal mullions. Complete information on Hope's "Biltin" Subframes is given in Hope's Catalog No. 122A. Write today for your copy.

HOPE'S WINDOWS, INC., *Jamestown, N. Y.*

THE FINEST BUILDINGS THROUGHOUT THE WORLD ARE FITTED WITH HOPE'S WINDOWS



How to build a *Dry, Beautiful Basement*

What could be finer than the feeling that the basements you build for your home owners will be dry and beautiful for years of satisfactory living, rather than damp and dingy in just a few short years. You can make this perfect basement a reality by building basements the Medusa way . . . with Medusa time-tested waterproofing and masonry paints!

First, specify Medusa Waterproofing (either Medusa Waterproofed Cements or Waterproofing Paste or Powder mixed with regular cements) in all concrete and mortar. Such waterproofing is inexpensive . . . yet combined with proper workmanship and materials, actually repels water at the surface, assuring a dry basement for the life of the home.

Next, for permanent beauty, paint the masonry walls with Medusa Portland Cement Paint, the original cement paint that won't peel, chip, or flake off masonry surfaces when properly applied. Finally, decorate the concrete floor with Medusa Rubber Base Paint, the special concrete paint that actually bounces off wear. The result is a perfect basement . . . watertight and beautiful. For additional information, wire, write or phone your nearest Medusa sales office.



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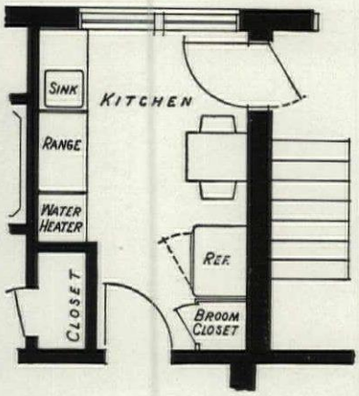
UNUSUAL KITCHENS planned to accommodate "home-size"

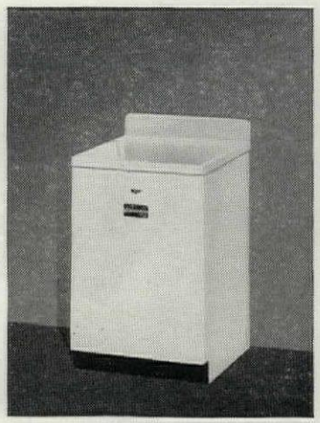
Frigidaire appliances in compact Florida apartments

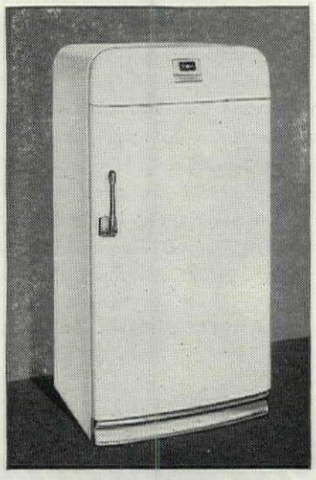


LOCATION: Daytona Beach, Florida
ELTON J. MOUGHTON, Architect
LAURA FAIR FERRAN, Owner









Home-size Frigidaire appliances like the model RO-40 range (above, at left), the table-top water heater (above, at right), and the model SO-73 refrigerator (left) are standard equipment in each one of the Ferran Apartment kitchens.

Economical use of floor space in the 46 kitchens in the compactly designed Ferran Apartments has enabled the owners to install "home-size," instead of "apartment-size" appliances. Reasons for this departure from the usual are best given in the owner's own words:

"The few dollars of cost over apartment-size models has proven to be one of our best investments," Mrs. Ferran says. "Our manager reports many of our rentals are made standing in the kitchen with a prospective tenant. When they see the kitchen with our full-size Frigidaire range, refrigerator and table-top water heater, they usually say, 'If the rest of the apartment is this nice, we'll take it.'

"This situation speaks of immediate benefits. But our choice of Frigidaire products was made on a long range basis. We wanted products that would continue to serve us and our tenants well—year after year. And we knew both from their reputation and from our own personal experience with them, that Frigidaire products would give us dependability, low current and maintenance costs."

Why not find out about the complete line of standard and apartment-size household appliances Frigidaire manufactures? For full information, call your Frigidaire Dealer—or the Frigidaire Distributor or Factory Branch that serves your area. Look for the name in the Yellow Pages of your phone book. Or write Frigidaire Division of General Motors, Dayton 1, Ohio. In Canada, Leaside 12, Ontario.

FRIGIDAIRE America's No. 1 Line

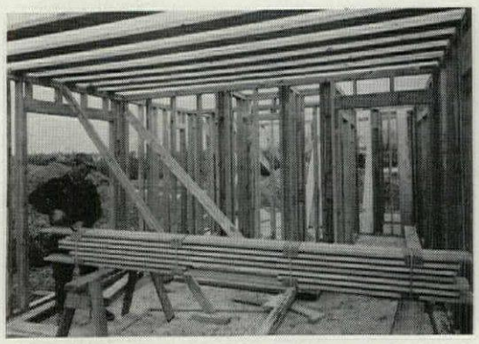
of Refrigeration and Air Conditioning Products

Refrigerators • Food Freezers • Water Coolers • Electric Ranges
Home Laundry Equipment • Electric Water Heaters • Air Conditioning
Electric Dehumidifier • Commercial Refrigeration Equipment

Frigidaire reserves the right to change specifications, or discontinue models, without notice.

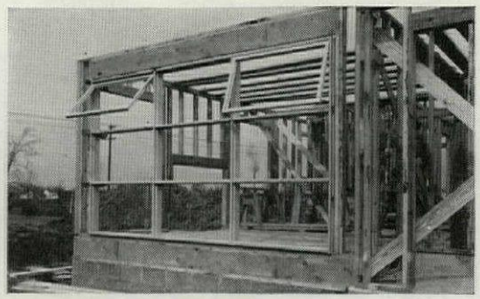
MULTIPLE WINDOW FRAME prefabricated for double glazing

Builders now can purchase factory-cut units for the popular window wall shipped knocked down ready for assembly and thus save the expense of constructing them on the job. The prefab frames are 2 x 6″ fir, rabbeted to accommodate standard size 45½ x 25½″ double insulating glass—desirable for this type of wall construction in all but the warmest parts of the country. The double glazing prevents frosting, condensation and excessive heat loss, and reduces drafts that are usually prevalent near large areas of ordinary glass. The manufacturer claims that the installed cost of the insulated glass wall units is no greater than the cost of conventional walls fenestrated with single glazed double hung or casement type windows. Price for the nine-light frame with two top-hinged ventilating sash is $50, f.o.b. Toledo; without the ventilators, $35.





The window wall frame arrives at the site in a single package. Two men can assemble and tip it into a prepared opening in about 20 minutes.



Manufacturer: Fabrow Mfg. Inc., Toledo, Ohio.

IMPROVED GLASS BLOCK reduce installation time

Two new features of Insulux light directing glass block should cut installation time and costs. The first innovation is a water repellent finish which is applied to the exposed faces of the block during manufacture. The coating prevents mortar from adhering to the glass surface during the laying operation, and so the panels can be cleaned easier and faster without strong acids. The second improvement is a gold stripe mechanically applied on the top mortar bearing edge of each block. To function properly the light directing block must be laid with a certain side out and a certain edge up. This stripe makes it easy to lay the block in correct position. If all the blocks in one course are placed correctly, the gold line is unbroken. An error in handling is thus quickly detected. Current price of the 8″ block in the New York City area is about 71 cents each.





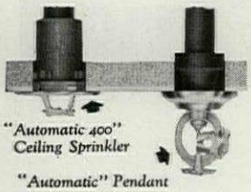
Manufacturer: Owens Illinois Glass Co., American Structural Products, Toledo 1, Ohio.

(Continued on page 204)



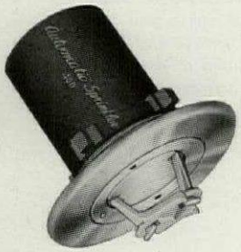
Lustig's, Inc. Youngstown, Ohio

in Fire Protection--too!



"Automatic 400" Ceiling Sprinkler

"Automatic" Pendant Sprinkler



The development of the *"Automatic* 400" **Ceiling Sprinkler** discounts the adage that you can't have beauty and fire protection too. For here is a sprinkler head that is designed to blend perfectly with the appointments of the most tastefully designed interior—finished in bronze or chrome, bright or satin, it projects less than one inch below the ceiling surface. Yet, regardless of its beauty, it's ready, willing and able to automatically extinguish fire whenever called upon to do so.

You'll find the *"Automatic* 400" **Ceiling Sprinkler** installed in the most distinctively decorated offices, stores, restaurants and public buildings. No longer is it necessary to sacrifice "eye appeal" in order to have fire protection that offers both safety and savings.

Contact our nearest *"Automatic" Sprinkler* representative for engineering counsel, surveys and estimates. They are available to you without obligation. Ask for free literature.

"AUTOMATIC" SPRINKLER CORPORATION OF AMERICA
YOUNGSTOWN 1, OHIO



"Automatic" Sprinkler
FIRST IN FIRE PROTECTION
DEVELOPMENT . ENGINEERING MANUFACTURE . INSTALLATION
OFFICES IN PRINCIPAL CITIES OF NORTH AND SOUTH AMERICA

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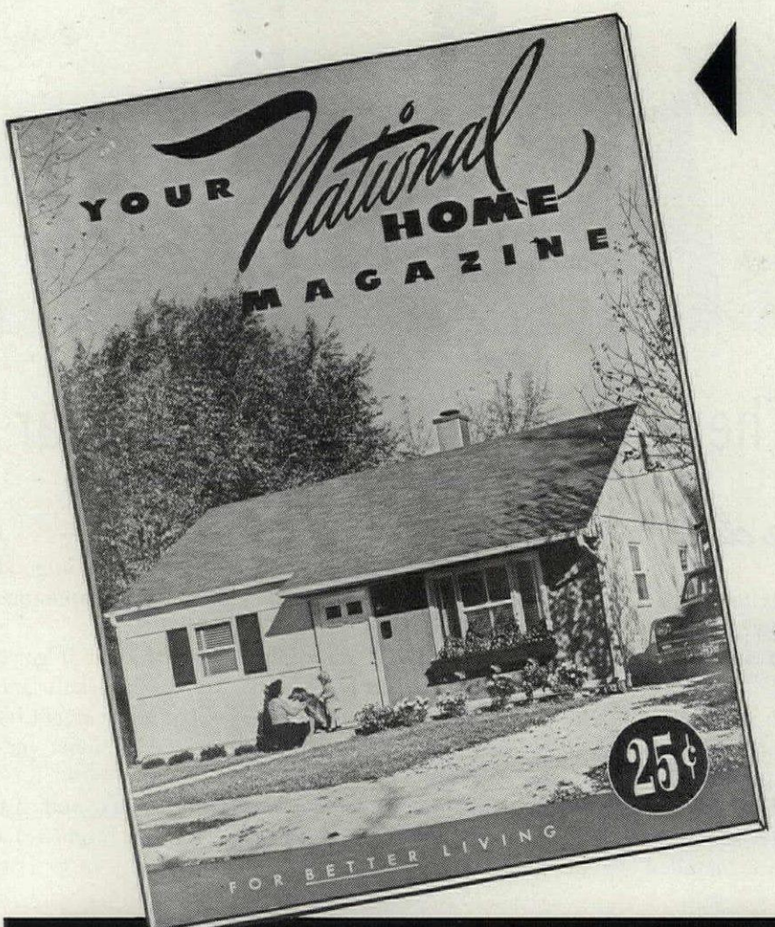
DEALERSHIPS

offer GOOD Business Opportunities some territories Now Open

By becoming a National Homes dealer you can be assured of having a steady supply of houses to erect.

You will combat rising costs by the advantages of our mass buying, streamlined production methods and the need for less field labor.

You will be supplying quality low-cost homes to thrifty families with savings to invest — an ever-increasing market further enhanced by a million dollar national advertising and promotion program over the past few years.



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• NATION'S LARGEST PRODUCERS OF PREFABRICATED HOMES •



He's Renewing These Walls for the 23rd Year

Renewing them with a Swish of a cloth!

These shining washroom walls in Hotel Jefferson, St. Louis, look clean and modern, don't they? Yet all anybody's ever had to do in 23 years is wipe them occasionally.

That sparkling surface is mirror-smooth paneling of *Vitrolite** glass. But let the hotel manager tell you what *he* thinks about this gleaming wall product.

"In 1928 we installed *Vitrolite* in both the mens' and ladies' washrooms. Its appearance today shows no deterioration whatsoever from the time it was installed. Not only has it been very serviceable, remained in good condition, but it is satisfactory from a maintenance standpoint, since it's so easy to wash."

Vitrolite makes a good impression *wherever* it goes. Dirt and germs can't get a grip. Moisture doesn't faze it. It *can't* warp or swell or deteriorate! You can get its deep-toned lustrous beauty in a variety of smart correlated colors.

See your L·O·F Glass Distributor today and get complete *Vitrolite* data. Or write for our architect's file book on *Vitrolite*. *®

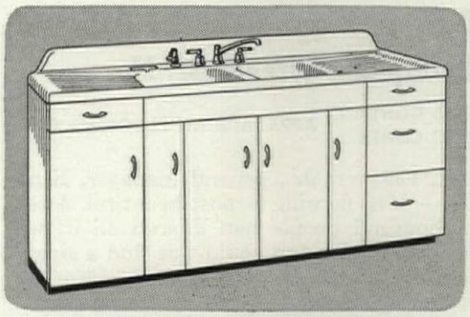
L·O·F GLASS

VITROLITE

MADE BY
LIBBEY·OWENS·FORD GLASS COMPANY
4751 Nicholas Building, Toledo 3, Ohio



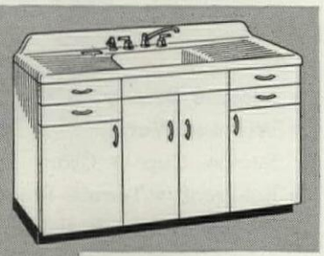
DELAFIELD K-5610-A.
32 x 21", 42 x 21".



WILSHIRE K-5505-A. 60 x 25", 72 x 25".



WELLWIN K-5595-A.
42 x 25".



CAMBERLEY K-5555-A.
54x22", 54x25", 60x25".



CYMBRIA K-5576-A. 42 x 22",
42 x 25". (Sink at left, K-5575-A.)

KOHLER

First Quality

Enameled Iron Sinks

The Delafield, popular for average homes and apartments, has a flat rim for building-in, roomy basins; the Wilshire, Wellwin, Camberley and Cymbria offer choice of double or single compartment sinks with or without drainboards, in various sizes. All have convenient full-length ledges with integral soap dishes, swing spout mixing faucets, lever-control sprayers. Duostrainers with removable cups assure positive drain control.

Kohler sinks are of non-flexing iron, cast for rigidity, coated with acid-resisting, easy-to-clean enamel. Fittings are of chromium-plated brass, engineered for long life.

Kohler Co., Kohler, Wisconsin. Established 1873

KOHLER OF KOHLER

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AIR-COOLED ENGINES • PRECISION PARTS



26,000 Dancing Feet—not a mar!

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by Higgins BOAT BUILDERS

Widely Used in Homes for Beauty and Economy

Because it keeps luxurious beauty for life, with minimum housekeeping attention, Higgins Flooring is being specified for individual homes (in *all* price brackets). For housing developments and apartments, Higgins Flooring combines distinctive appearance with low maintenance cost.

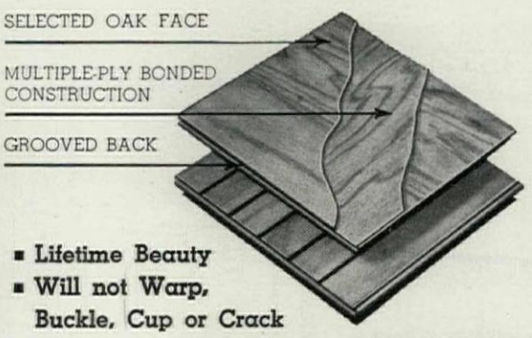
Higgins Flooring is ideal over radiant heating. Grooves on back of blocks act as heat conductors, assuring uniform heat with practically no increase in water temperature. Higgins Flooring can be installed over any type of slab—will even breach slightly uneven slabs. Being simple to install, Higgins Flooring costs less, laid down, than any comparable hardwood flooring.

Even under severe conditions, you can specify Higgins Flooring with perfect assurance of low-cost, lifetime satisfaction.

10,000 Sq. Ft. Higgins-Floored Ballroom
King Phillip Co., Wrentham, Mass.

GENERAL CONTR. } APPALACHIAN FLOORING CO.
FLOORING CONTR. }

Said E. R. Enegren, Jr., general manager, King Philip Co.—"The flooring is most beautiful. After thirteen thousand people had danced on it, we inspected it carefully and could not find a single imperfection. And it *was laid in record time of six days*—including removal of old maple flooring."



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- **Will not Warp, Buckle, Cup or Crack**
- **Rot-Proof** ▪ **Termite-Proof** ▪ **Water-Repellent**
- **Climate-Proof** ▪ **Resists Abrasion and Soiling**

Write for Literature and Sample Block



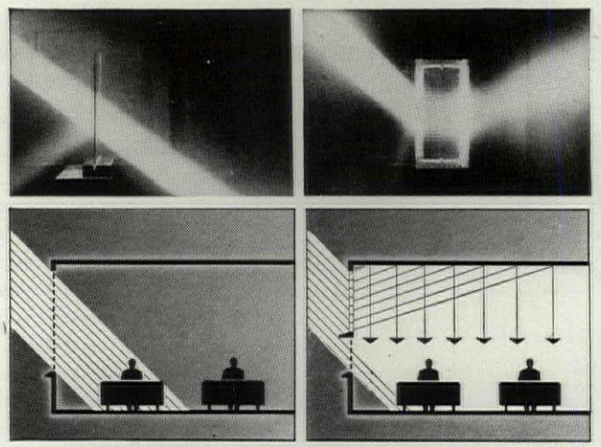
Higgins
INCORPORATED NEW ORLEANS

BONDED HARDWOOD BLOCK FLOORING



Michigan Carton Company, Battle Creek, Michigan
Architect: Shreve, Walker & Associates, Detroit, Michigan
Contractor: Herlihy Mid-Continent Co., Chicago, Illinois

DESIGN FOR MORE AND BETTER USE OF DAYLIGHT ...THROUGH Daylight Engineering



Direct sun causes uncomfortable brightness near windows, extreme contrast in other parts of room. Insulux Fenestration (glass block plus vision strip) directs and spreads daylight to ceiling, keeps brightness at comfortable levels, provides vision and ventilation.

You can make free daylight pay profitable dividends by designing for *greater* and *better* use of it through Daylight Engineering principles. Through Daylight Engineering an Insulux Fenestration System controls light so efficiently that your building virtually "turns with the sun." Entire glass areas can be used for the transmission of free daylight from early morning to late afternoon. Such areas admit an abundance of cheerful, *quality* daylight into the farthest corners of your office or plant.

An Insulux Fenestration System can't rust, rot or corrode. Maintenance costs are extremely low. It provides an insulating, sound-reducing panel that is highly fire-resistant.

It's easy to give your present building, or the ones you plan, the many advantages of an Insulux Fenestration System. A Daylight Engineer will be glad to show you the benefits such a system can bring to your structure. Just write: Daylight Engineering Laboratory, Dept. MB-5, Box 1035, Toledo 1, Ohio. Insulux Division, American Structural Products Company, Subsidiary of Owens-Illinois Glass Company.

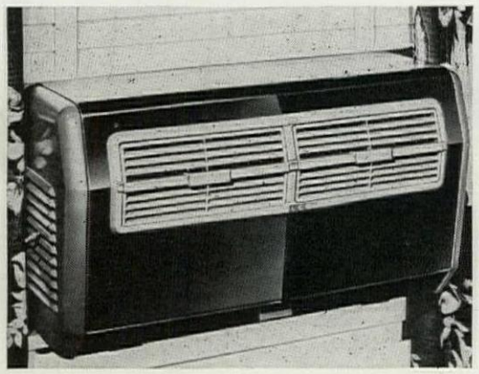
INSULUX GLASS BLOCK

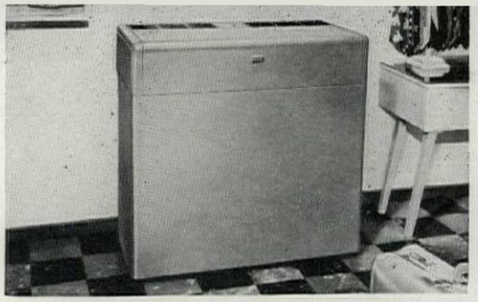
INSULUX FENESTRATION SYSTEMS

—by the pioneers of Daylight Engineering

ROOM AIR CONDITIONERS meet various home cooling needs

Providing air conditioning for almost every residential application from a single room up to an entire house, Philco's 1951 line include two window sill units and two consoles. Each of the new models cools, filters and dehumidifies air, and shuts out street noises, soot and dirt. They contain hermetically sealed motor-compressor units, and feature a pump-out control which can





The ¾ h.p. sill model (left) will air condition a room with a floor area of 400 sq. ft. With the addition of ductwork, the console unit (above) can handle the cooling needs of a small house.

be utilized to remove smoke, stale air and cooking odors from the area. Designed for compactness the Model 50-G ½ h.p. sill conditioner extends only 10″ into the room. It is engineered for use in rooms up to 15 x 19′ with 9′ ceilings. Price for the 50-G is $339.95. The ¾ h.p. 75-GL can be placed in rooms up to 20 x 20′ and sells for $399.95. Both sill units are available in either soft ivory or two tones of beige enamel. An air cooled console model, the 100-GC, is cabineted in walnut and has a simulated leather top. Fresh air and pump-out dampers are concealed behind hinged doors at each end of the cabinet. All controls are easily available but are also hidden from view. The front grille may be adjusted to direct air toward floor or ceiling and deflectors behind the grille deflect air flow to the right or left. This model, suitable for large living rooms, showrooms and offices, sells for $685. The only water cooled model in the line, the 200-GCW has several design features: It can be utilized for cooling two adjoining rooms or even two floors of rooms (having a total area of not more than 1,500 sq. ft.) by the addition of ductwork. It has two separate 1 h.p. units, one of which may be used independently in moderately warm weather (or to serve one area). Both may be turned on during "dog days." Because it is water cooled, no access to outside air is needed. The Model 200-GCW is priced at $985. Its cabinet, finished in light tan baked enamel, measures 39¼″ high, 42¼″ wide and 22¾″ deep. All the models carry a five year guarantee.

Manufacturer: Philco Corp., Philadelphia, Pa.

PORTABLE DEHUMIDIFIER takes dampness out of basements, protects storeroom goods

A small lightweight electric dehumidifier, the Moisture Magnet removes excess moisture from indoor air, promoting the occupants' comfort and protecting furnishings and equipment against the mildew and rust ravages of dampness. The unit removes 14 pints of water every 24 hrs. from room air at 80° F. and 79% relative humidity, and up to 24 pints during the same time period under more severe conditions. However, it will not overdry air at ordinary room temperature. Installation consists merely of plugging the dehumidifier into a 115 V. single phase 60 cycle outlet. A fan draws the damp air over hermetically sealed refrigeration coils where the moisture condenses, and then the dry reheated air is expelled into the room. The coils are engineered to cause the moisture to form droplets quickly, thereby preventing re-evaporation. A rustproof 8 qt. receptacle contained in the bottom of the unit

(Continued on page 210)

Why architects are switching to Skylike®

SILVRAY INCANDESCENT LIGHTING WITH A FLUORESCENT LOOK



Introduced only a few months ago, Silvray SKYLIKE lighting is already installed in showrooms, schools, stores, offices, laboratories, and other interiors.

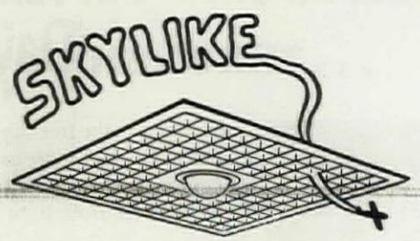
Architects have been quick to recognize SKYLIKE lighting as a unique combination of the best features of silvered-bowl incandescent units with the modern appearance of fluorescent-type troffers.

Only Silvray SKYLIKE fixtures provide all these advantages:

1. High initial and maintained light output.
2. Softly diffused shadows.
3. Low brightness and 90° shielding.
4. No flickering, blinking, or hum.
5. Warm color—most desired by merchandising experts.
6. Instant starting.
7. Variable lamp size—150- to 500-watt.
8. No light loss from darkened walls or ceilings.
9. Floor-service relamping—no ladders or scaffolds.
10. Hermetically sealed silver reflecting surface.

SKYLIKE systems are flexible and easy to plan. Units fit 24″ x 24″ ceiling tiles . . . can be fully or partially recessed, or surface-mounted—in rows or patterns.

For easy conversion to directional or accent lighting, a semi-silvered-bowl lamp and a simple accessory are used to replace the original lamp.





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WHEN GAY LIVING

GIVES FLOORS A GRIM TIME...



Tile-Tex takes it with a smile

This quality asphalt tile sticks permanently to concrete floors, even on or below grade.

It adds resilience, warmth, beauty . . . at *low, low* cost.

A floor of Tile-Tex* Asphalt Tile dresses up any part of the house. And, it can be a *big* help in transforming a dreary basement into a playtime palace for the whole family . . . at surprisingly *little* cost.

Jitterbug jubilee or quiet game of chess . . . this tough, resilient floor matches the mood of the party.

A warm design or a gay pattern . . . Tile-Tex has it.

You have a wide range of sizes, a rainbow of colors (28 of them).

Versatility of laying tile-at-a-time makes decoration almost a question of "name it, and you can have it."

You can even have special inserts, custom-cut to your own specifications and set into the floor.

Another Tile-Tex advantage is the ease of keeping it clean. A brush with the broom removes loose dirt. Washing is only an occasional necessity. And, if you want a high shine, it's easy to wax.

Add really exceptional durability to all the other qualities, and you can't help deciding on Tile-Tex.

A Tile-Tex floor will give the average family a lifetime of trouble-free service, and with reasonable care, show no signs of wear.

So, if you plan to re-do the basement, finish the attic, or build from the ground up, consider Tile-Tex Asphalt Tile for floors. Chances are you will place it in your plans.

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ASPHALT
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Look up your local Tile-Tex contractor in the classified telephone book. If he is not listed, write for data: THE TILE-TEX DIVISION, The Flintkote Company, Dept. R, 1234 McKinley St., Chicago Heights, Ill.

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"BOLTA-QUILT is made with specially formulated Boltaflex for extra durability in public use."



"NOTE the flame-resistant cotton filling, backed by a thin sheet of clear film and covered with beautiful Boltaflex in a wide choice of colors."

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(ELECTRONICALLY QUILTED *Boltaflex*)

A Great New Product for Decorators

Here's quilted plastic by the makers of famous Boltaflex, *specially formulated to take extra wear* in hotels, offices, restaurants and homes. Bolta-Quilt is magnificent for walls, bar fronts, booths, wainscoting, desks, and furniture of all kinds.

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Nothing has been overlooked in the formulation of this beautiful new decorating material. Designed to take the rough usage of public life, it's made of specially formulated Boltaflex. It wears like iron! . . . yet it has the same soft feel for which Boltaflex has always been famous.

And, of course, Bolta-Quilt retains all the usual Boltaflex qualities:

- Resists Fading
- Will not chip or peel
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- Resists stains of all types
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Fill out the coupon below . . . complete information on this outstanding new decorator material will be rushed to you.



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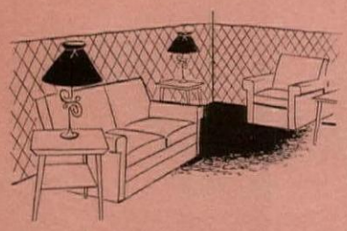
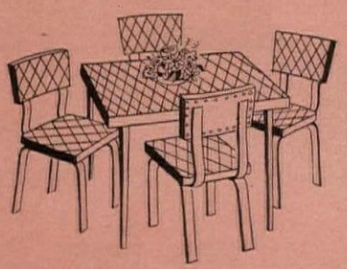


BOLTA-QUILT-COVERED WALL IN HOTEL LOBBY



DINING TABLE AND CHAIRS TRIMMED WITH BOLTA-QUILT



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means Covered with lasting Beauty

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I am interested in Bolta-Quilt (Electronically Quilted Boltaflex) for use in_____

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☐ Also send me complete Boltaflex information and samples.

STAINLESS STEEL INSURANCE

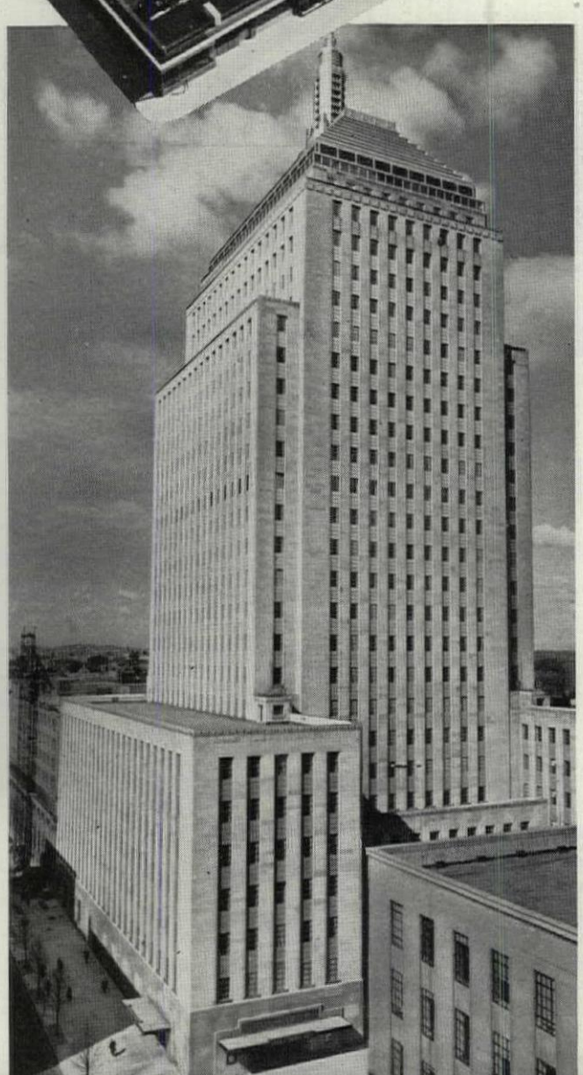
for Insurance Companies



New York Life Insurance Company's residential apartment building, "Manhattan House," in New York City.



The Mutual Life Insurance Company of New York's building on Broadway at 55th St.



John Hancock Mutual Life Insurance Company's building, Boston, Mass.

Proven strength, attractive appearance, low maintenance cost and long-life economy are the advantages gained by the use of stainless steel in approximately 300 different architectural applications. Many of these applications were specified for outstanding apartment and office buildings erected or now under construction by some of the largest insurance companies.

Curtain walls . . . entrance and lobby railings . . . trims . . . marquees . . . louvers . . . restaurant and store fronts . . . balconies . . . towers . . . window frames . . . mullions—these are some of the important uses of stainless steel.

In your plans for the future, take full advantage of the unique qualities of stainless steel for your buildings . . . for durability and over-all economy insurance.

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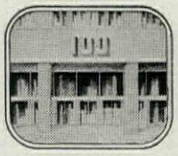

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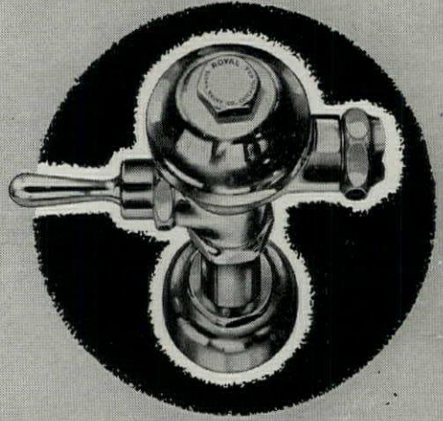
ONCE THE RENDEZVOUS OF GAIETY AND WIT

Oldtimers who now enter 100 Park Avenue may recall names and events which brought much fame to New York's grand old Murray Hill Hotel, but memories of those fabulous times are quickly forgotten in the presence of integrated architectural beauty and modern business home efficiency.

As this New York address is famous, so are many product names found throughout the new 36-story building. Prominent among them is SLOAN FLUSH VALVE—a name placed there by its long-standing reputation for *complete* satisfaction. This reputation gave Sloan the unapproached leadership which has been maintained throughout the years, and which explains why . . .

***more* SLOAN *Flush* VALVES**
are sold than all other makes combined

SLOAN Royal FLUSH VALVE



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THE ROYAL is suitable for installation in every type of building. It needs no adjustment and will deliver a uniform flush at all pressures between 10 and 100 pounds.



The Secret of GOOD WASHROOM PLANNING

Fixture ratios based upon industrial plant populations, male and female

THE RIGHT FIXTURES

WATER CLOSETS

PERSONS MALE OR FEMALE

1-9 1
10-24 2
25-49 3
50-100 5
Over 100, add 1 closet for each 30 additional persons.

URINALS

Wherever urinals are provided for men, one water closet less than the number specified herein may be provided for each urinal, except that the number of water closets shall not be reduced to less than ⅔ of the number specified herein.

LAVATORIES

PERSONS LAVATORIES

1-100 1 for each 10 persons.
Over 100 add 1 lavatory for each 15 additional persons.

SHOWERS

1 for each 15 persons who may be exposed to excessive heat, or to skin contamination with poisonous, infectious, or irritating material.

...IN THE RIGHT PLACES

CHECK THE DETAILS OF THIS SMALL WASHROOM:

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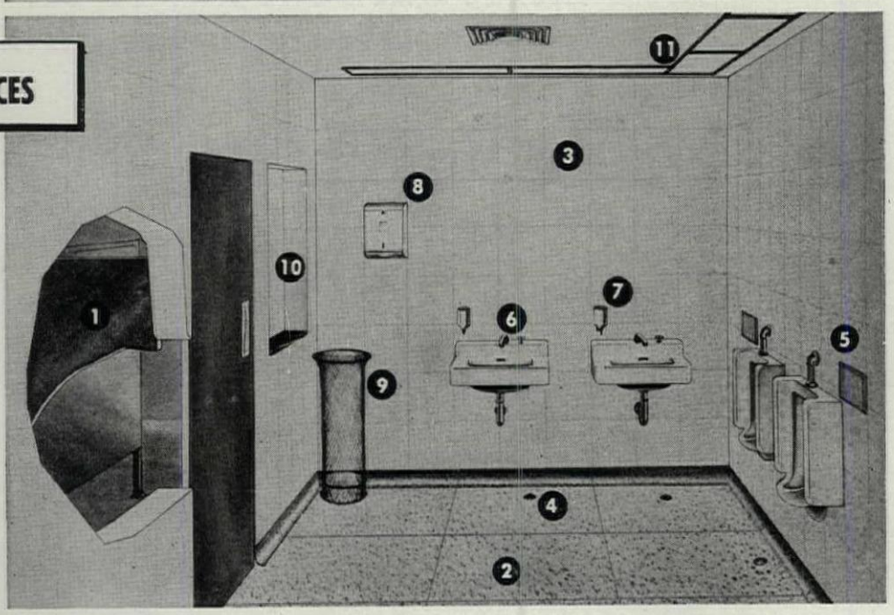
(2) Sloped floors of terrazo (tile or concrete)—impervious to moisture, easy to clean. *Ideal drain location.*
(3) Glass or tile walls, walls and floors coved at juncture—moisture-resistant.
(4) Foot-control valves to operate wall-hung lavatories, urinals.
(5) Exhaust vents above fixtures.
(6) Single faucets for hot and cold water mixing.
(7) Soap dispensers over left side of basin.
(8) Towel dispenser away from basins, near exit.
(9) Waste receptacle with large open top.
(10) Recessed shelves, mirrors and lights.
(11) Recessed fluorescent lighting for proper illumination over facilities.



"Watch the details!"—sound strategy in planning *modern* washrooms. Fixtures should be modern, in sufficient number . . . and correctly located.

Up-to-date washrooms in your client's plant can save him thousands of dollars a year! Properly located facilities save man-hours wasted going to and fro. Good sanitary measures keep health and morale up . . . absenteeism down.

Questions? Send for the free pamphlet shown below. It's a good summary of the personnel, traffic and maintenance considerations that go into modern washroom planning. Need more details? Your Scott Washroom Advisory Service consultant has them all. He has the know-how gained by the group of Scott trained specialists who have serviced over half-a-million washrooms.

Contact Scott Washroom Advisory Service, Scott Paper Company, Chester, Pa.





SCOTT

Symbol of Modern Washrooms

Trade Mark "Washroom Advisory Service" Reg. U. S. Pat. Off.

Washroom Advisory Service, Dept. G
Scott Paper Company
Chester, Pennsylvania

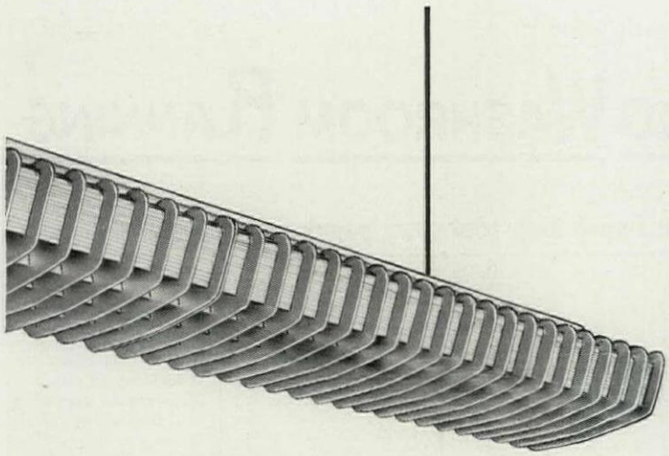
At no cost or obligation, please send me your study of personnel, traffic and maintenance problems, *"Plant Washroom Designing."*

Name_____

Company_____ Title_____

Address_____

City_____ Zone_____ State_____



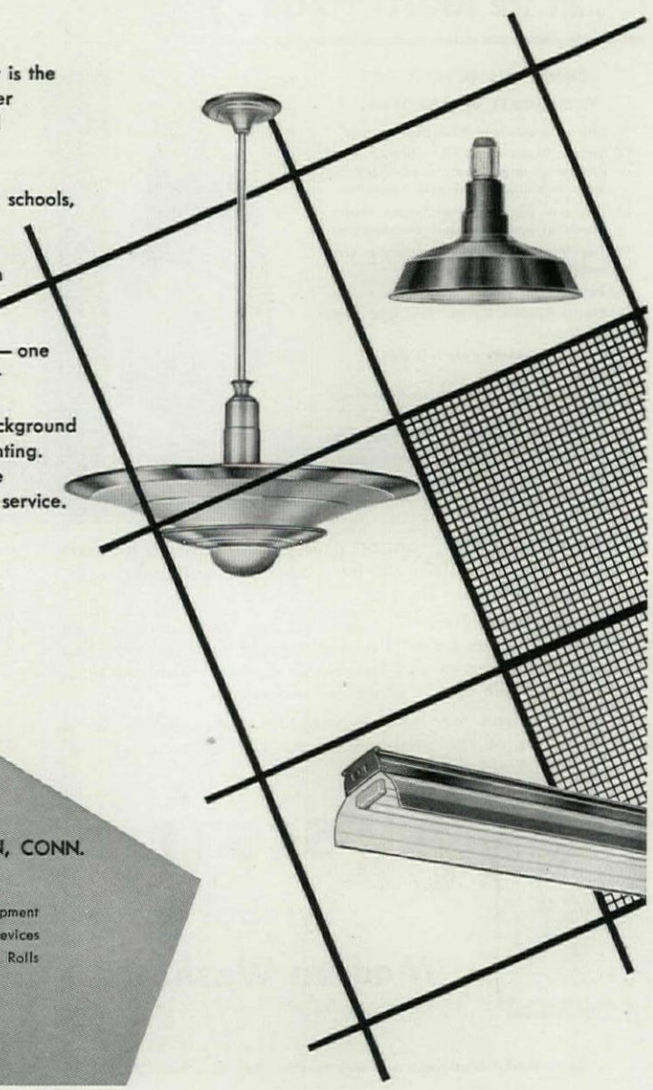
Nardin & Radocay

THERE'S ONLY ONE WAY TO GET COMPLETE LIGHTING SATISFACTION

Only one way — QUALITY EQUIPMENT. It is the economical way, too. That is why it is best to specify Miller lighting equipment. It is built on an 8-Point standard of quality construction, with engineering features that minimize cost of installation and maintenance.

Thousands of installations, in stores, offices, schools, factories and public buildings, have proven the enduring QUALITY of Miller lighting equipment, and its LOW OVERALL COST — cost of equipment, installation and maintenance — the important point to be considered in planning lighting.

For complete lighting satisfaction, SPECIFY MILLER — one source of supply for QUALITY equipment for the best use of Fluorescent, Incandescent, and Mercury-vapor lighting. Developed on a background for 107 years pioneering and progress in Good Lighting. Miller field engineers and distributors are conveniently located for nation-wide service.



THE miller COMPANY MERIDEN, CONN.
SINCE 1844

ILLUMINATING DIVISION: Fluorescent, Incandescent, Mercury Lighting Equipment
HEATING PRODUCTS DIVISION: Domestic Oil Burners and Liquid Fuel Devices
ROLLING MILL DIVISION: Phosphor Bronze and Brass in Sheets, Strips and Rolls



Valentine Theater in Toledo, Ohio. *Architects:* Rapp and Rapp, Chicago.

How to make a Good Impression

How does a person feel about a building he enters or leaves? Does he peg it as smart? Or dowdy?

The entrance has a lot to do with it . . . which probably explains the ever-growing use of *Tuf-flex** doors for stores, theaters, banks, hotels, apartments, offices and many other buildings.

These doors combine transparency with toughness. *Tuf-flex* doors are ¾"-thick plate glass, tempered to make them 3 to 5 times stronger than regular plate. They're made to stand constant usage.

They build traffic, too—a value store owners have discovered. These clear doors accent the invitation of the Visual Front—the wide-open front that has won such favor in modern store design.

All *Tuf-flex* doors are furnished complete, equipped with bronze or alumilited aluminum fittings, which are designed to receive standard pivot hinges and other builders' hardware. *Tuf-flex* doors are available in a variety of designs and hardware finishes to meet your requirements.

For full information—sizes, hardware and installation details—see your L·O·F Distributor. And mail the coupon below for a copy of our book on *Tuf-flex* doors.

*®

L·O·F GLASS

TUF·FLEX

Tempered

Plate Glass DOORS

MADE ONLY BY **LIBBEY · OWENS · FORD GLASS COMPANY**
6685 Nicholas Building, Toledo 3, Ohio

Libbey • Owens • Ford Glass Company
7351 Nicholas Building, Toledo 3, Ohio

Please send me a copy of your book showing uses of *Tuf-flex* doors, as well as your installation detail folder.

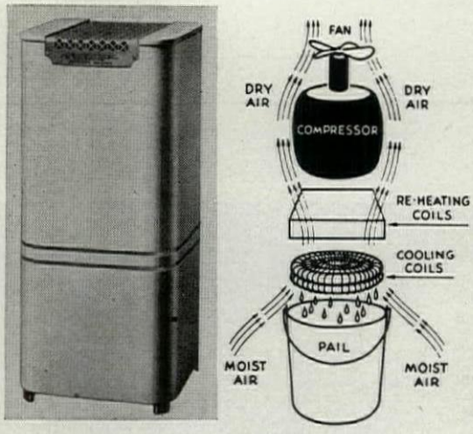
Name_____

Company_____

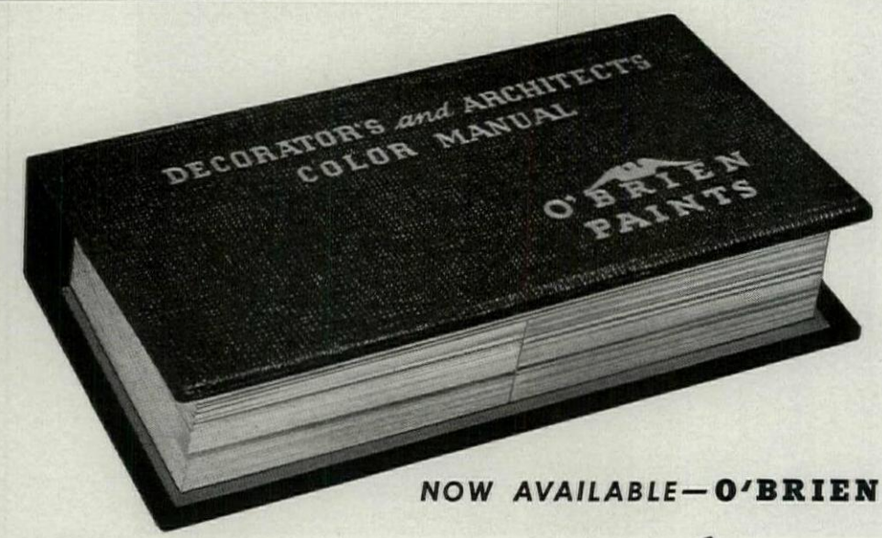
Address_____

catches the drops and can be slid out easily for emptying. Or, if desired, the Moisture Magnet may be placed over a basement drain. Operation is said to be noiseless and efficient, and to consume no more current than a household electric bulb. The unit is 30½" high, 13" deep. Its cabinet is constructed of tempered plastic-impregnated fiber and is finished in gray. The Moisture Magnet retails at $149.95. A 5-yr. warranty covers its power unit.

Manufacturer: Remington Corp., Auburn, N. Y.



Installed by being plugged into a wall outlet, the dehumidifier will remove about 14 pints of water from a room during a hot and muggy summer's day.



NOW AVAILABLE—O'BRIEN

Colors of '51

Selected to harmonize with 1951 fabrics, draperies, floor coverings!



Handy, pocket size. Full-page 6" x 3" swatches, split for easy comparison.

Send for your copy of the new *O'Brien Color Manual* —or call your O'Brien dealer, today! Presents a full range of over 100 authentic, up-to-the-minute colors, developed by O'Brien Color Stylists, working with leading color authorities! Simple! Easy to use! Ends color matching headaches! Complete mixing instructions, where needed, assure exact color you specify. Use O'Brien Colors of 1951 this year for beautiful interiors. All colors made with O'Brien's Liquid Velvet, America's *Most Washable* flat: most colors, with Satin Finish and Interior Gloss. The O'Brien Corp., South Bend, Ind.; Baltimore, Md.

See full-page, full color O'BRIEN COLORS OF 1951 ad in April, Better Homes & Gardens, House Beautiful, Living.

THE O'BRIEN CORPORATION, Dept. A-5
South Bend 21, Indiana
Rush my copy of new O'Brien Color Manual for which I enclose $1.75.

Name_____

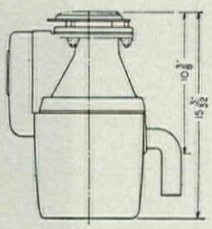
Address_____

O'BRIEN PAINTS
TOP QUALITY SINCE 1875

GARBAGE DISPOSAL UNIT can be connected to existing plumbing

Cutting installation costs by about 20%, the new Disposal MW-6 will fit any 3½ to 4" sink opening and can be rotated easily to line up with existing plumbing by means of a simple lock ring fastening arrangement. Finished in metallic gray and white paint, the model is cleanly styled with all wires concealed. Although about 2" shorter than previous units, it has a capacity of 2 qts. To use the appliance, the sink control is set to "on" and the cold water turned on. The Disposal takes about a minute to grind and flush away food waste from an average meal. Operating costs are said to be less than 10 cents a month. When off, the drain lock acts as a water-



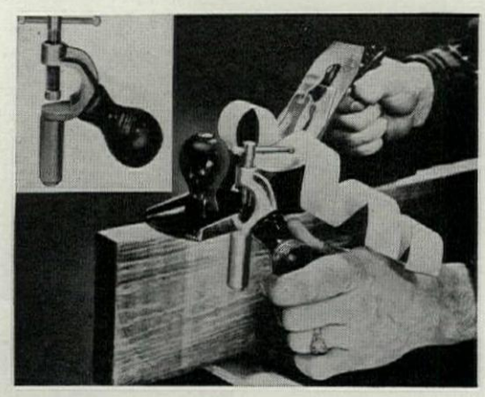


tight sink stopper. Where the disposers are to be used with septic tank systems, the manufacturer recommends a 500 gal. tank. Retail price for the MW-6 is $124.95.

Manufacturer: Hotpoint, Inc., 5600 W. Taylor St., Chicago 44, Ill.

PLANE GUIDE assures accurate square edges

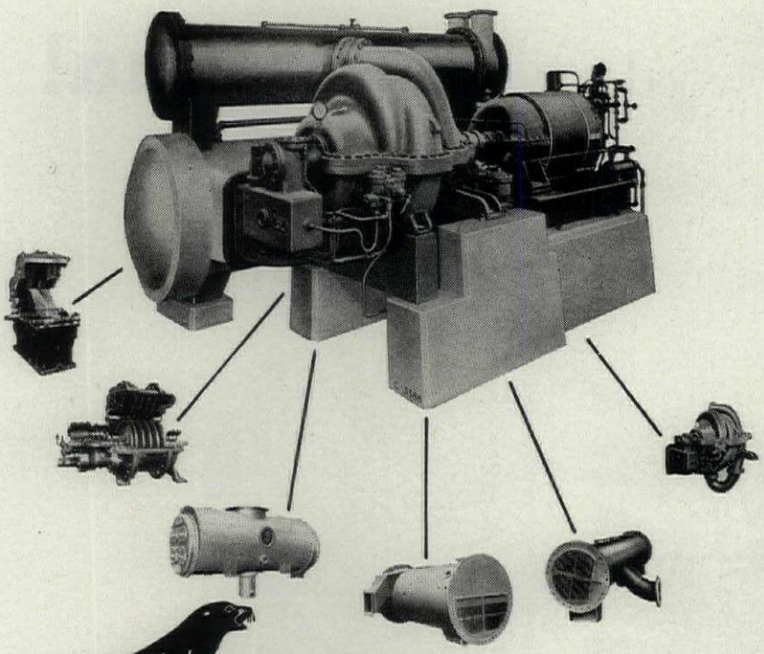
Even unskilled carpenters can plane perfectly square edges consistently with the Square-Ezy plane guide. This attachment, made in various sizes to fit standard planes, consists of a clamp with a free-turning cylindrical sleeve which extends below the base of the plane. The sleeve acts as a fence and keeps the plane at a 90° angle to the side of the board being planed. A hardwood knob on the side of the device enables



the user to put sideward as well as downward pressure on the plane. A uniform bevel also can be obtained by adjusting the angle of the plane blade. The Square-Ezy sells for $3.95.

Manufacturer: Bratton Co., Edwardsville, Kans.

(Continued on page 216)



Where do you get

UNDIVIDED RESPONSIBILITY

in an installation of centrifugal refrigeration?

Worthington will "wrap up a package".

Unlike other manufacturers of air conditioning and refrigeration equipment, Worthington *makes*—not just assembles—all the major components for each installation.

Compressor, condenser, cooler and such drive equipment as steam turbines, steam condensers, motors, and step-up gears—are all made in Worthington's own plant—each carefully designed for balanced operation with its companion components.

So the builder and owner can place full responsibility on the one supplier —Worthington.

Worthington centrifugal systems are used with most refrigerants and for any process—chilling water, brine, chemicals, lubricating oils—for temperatures as low as minus 160 F, capacities from 150 to 2600 tons.

A typical Worthington compressor feature is the arrangement of the volute passages and impellers to counterbalance the radial and axial thrusts, respectively, in the various stages.

Write for Bulletin C-1100-B14 on Worthington centrifugal refrigeration.



Worthington room conditioners for both heating and cooling are built to operate with chilled water or direct expansion cooling, capacities from 350 to 600 cfm for under-window installation.

PACKAGE UNITS SELECTED TO COOL HUGE OFFICE BUILDING



This is an excellent example of how Worthington's complete line makes it possible to select exactly right equipment.

The new office building at 488 Madison Avenue, New York—home of many famous magazines and large industrial firms—is air conditioned primarily by package units, assisted by a Freon-12 reciprocating system with chilled water and steam coils.

Purpose of using package units in a big building like this is to provide for a variety of conditions imposed by both the building and the type of tenants: air conditioning needed only on top floors during certain seasons, difference in sun load on various sections, certain tenants working late hours but only with skeleton forces.

Second through 20th floors are handled by 38 Worthington 20 and 25 ton Package Air Conditioners, two per floor. Basement, first floor and top three floors are handled by two Worthington 75-ton Freon-12 compressors complete with condensers, pumps, water coolers and five central station units with chilled water and steam coils. Total capacity is 1050 tons.

Builders and owners: Uris Bros. Consulting engineer: Henry Oehrig. Air conditioning contractor: Raisler Corp. All of New York.

RICE HOTEL MULTIPLIES COMFORT-COOLING WITHOUT REQUIRING MORE ROOM



Last year, Houston's Rice Hotel completed air conditioning its entire building, including a thousand guest rooms, dining rooms and meeting rooms, by installing three Worthington 600-ton centrifugal chilled water systems.

This equipment, utilizing Freon-11, replaced ammonia refrigeration equipment having a capacity of 350 tons, yet occupies no more space than formerly.

Worthington equipment was selected primarily because Worthington could provide 100% equipment of its own make. The compressors are driven by Worthington steam turbines and steam condensers.

Engineer: Reg. F. Taylor. Mechanical Contractor: Charles G. Heyne & Co. Architect: Kenneth Franzheim. All of Houston.

WORTHINGTON

AIR CONDITIONING AND REFRIGERATION

INVESTIGATE

MORE WORTH WITH WORTHINGTON

Consult Classified Telephone Directory for nearest Worthington distributor. Worthington Pump and Machinery Corporation, Air Conditioning and Refrigeration Division, Harrison, N. J., specialists in air conditioning and refrigeration for more than 50 years.

A.1.2

The Greeks had a word for it... εὐπάθεια!

(comfort)



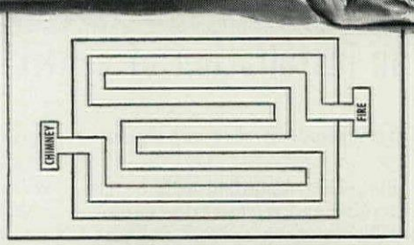
For the "comfort" of radiant heat today steel pipe is first choice—

Self preservation is the first law of nature and man's urge to seek comfort is part of it. Civilizations long extinct knew that, too. The ancient Greeks had a word for it which means the same but doesn't look nor sound as warm and friendly as our own word "comfort."

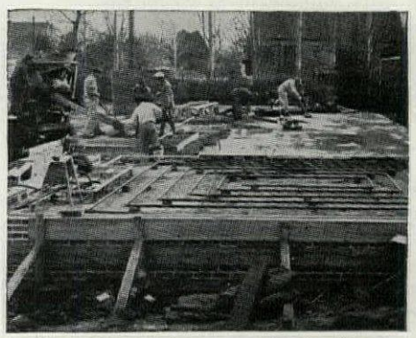
But in whatever language you say it, one of the ways of attaining comfort is by keeping warm, and the Ancients knew about radiant heating centuries ago. By passing smoke and hot gases from their fires through ditches and ducts, they warmed the floors and radiated heat throughout their homes.

Today radiant heating brings sun-like warmth to every room, in a completely scientific and effective way, by circulating hot water through embedded steel pipe coils. Proved through more than 60 years of service in conventional hot water heating systems, steel pipe has every quality required by modern radiant installations . . . low cost, strength, weldability, formability, and complete suitability.

Yes, if the Greeks had known about it they would have had words to say "steel pipe is first choice," too.



The ancients utilized channels beneath their floors to draw hot gases through from firebox to chimney, as shown above, thus warming floors.

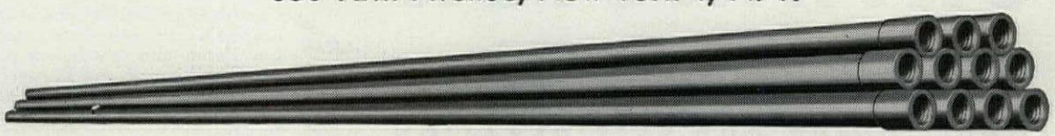


Today steel pipe coils are embedded in floors or ceilings during initial construction to provide advantages of radiant heating.

COMMITTEE ON STEEL PIPE RESEARCH

AMERICAN IRON AND STEEL INSTITUTE

350 Fifth Avenue, New York 1, N. Y.



ANOTHER ADVANTAGE OF BUILDING WITH HOMASOTE . . .

MAXIMUM SIZE, STRENGTH and INSULATING VALUE combined with LIGHT WEIGHT



. . . for the Emergency
. . . for New Home Construction
. . . for Modernization of homes, offices, factories, farm buildings

No matter what the emergency, Weatherproof Homasote always plays an important part in the construction picture. This famous insulating-building board—combining unusual strength with sizes up to 8′ x 14′—meets all types of military and civilian construction, temporary or permanent . . . barracks, warehouses, housing, field and ammunition shelters, field kitchens, camouflage, map mounting and road signs. Homasote's light weight makes it easy to handle; its strength and compactness permit easy portability without breakage.

For new home construction, Homasote provides the strongest insulation-board sheathing available. For interior, dry wall construction, the big sheets provide crackproof walls and an ideal base for either wallpaper or paint. The average room wall is covered with one piece—8 feet high and up to 14 feet in length! With its high resistance to air infiltration and moisture, Homasote has successfully withstood the greatest extremes of snow, hurricanes, tornadoes and floods—from the Aleutians to the Antarctic.

For modernization and repairs, Homasote finds many uses in all types of buildings . . . to finish an attic or add a room; for renovating porch ceilings; for factory office partitions; for storage and construction sheds, garages, play houses, tool houses, barns, roadside stands, dog houses, bath houses; for outdoor advertising signs; for boat and trailer interiors.

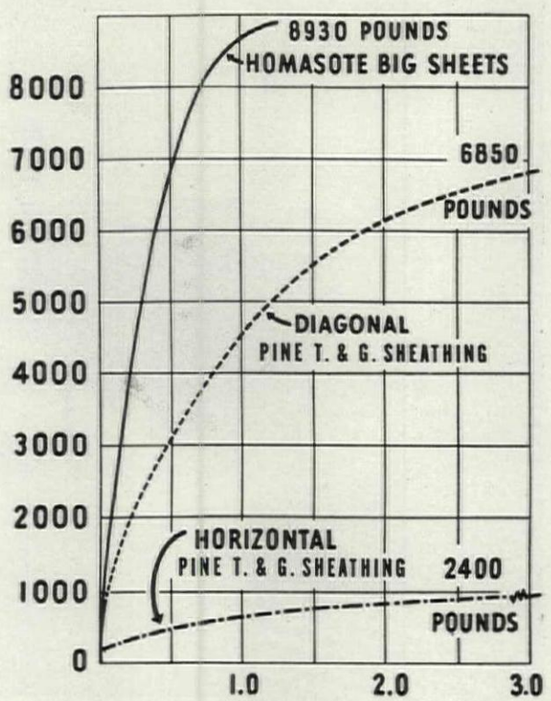
Write for literature and specifications folder showing how to use this outstanding product. *Please give us the name of your lumber dealer!*

HOMASOTE COMPANY, Trenton 3, N. J.



SEE OUR CATALOG IN SWEET'S

. . . in Big Sheets up to 8′ x 14′

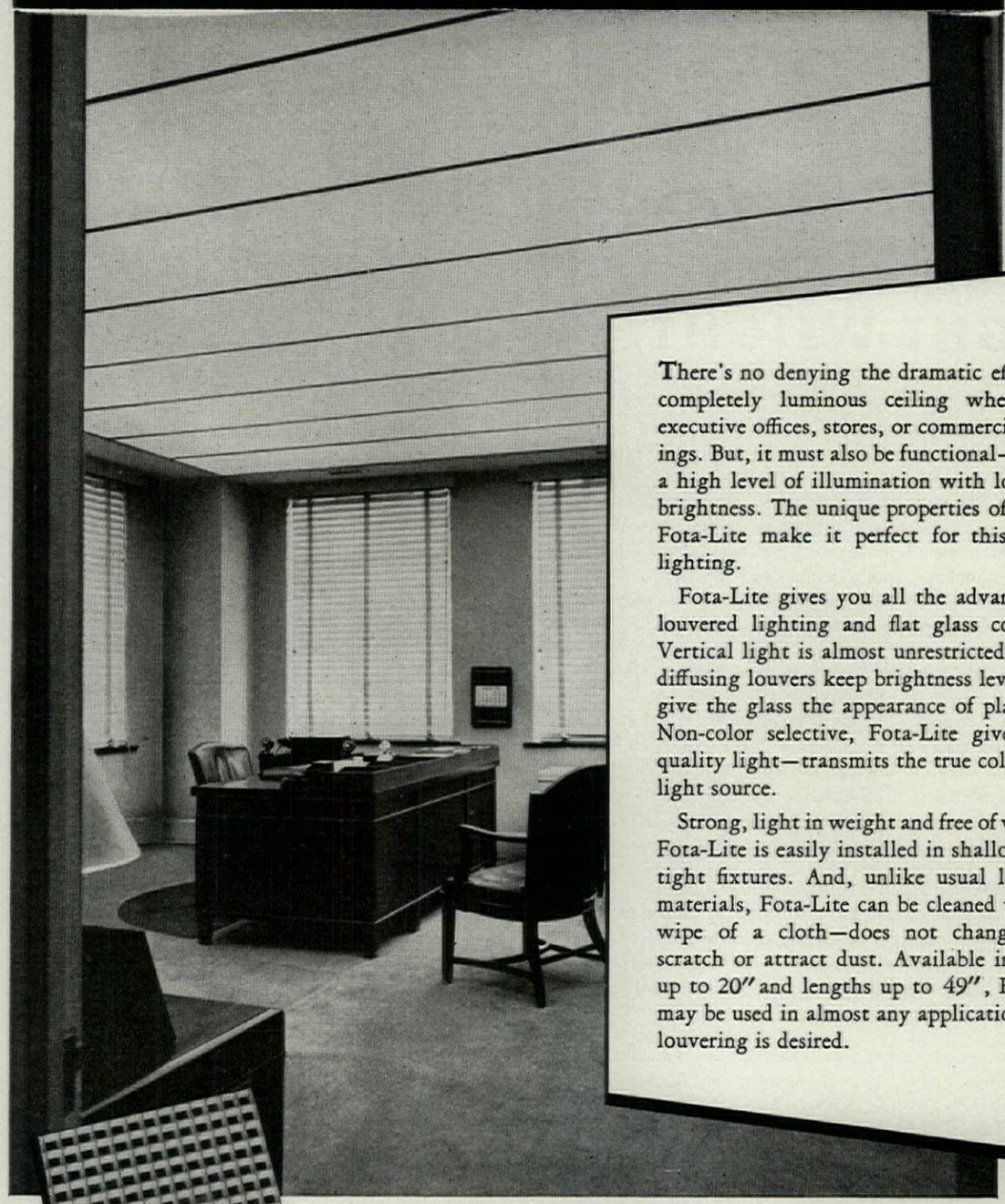


RACKING TESTS prove Homasote Sheathing 33.6% *stronger* than diagonal wood sheathing and 272% *stronger* than horizontal wood sheathing.

. . . oldest and strongest insulating-building board on the market

Nova Sales Co.—a wholly-owned Homasote subsidiary—distributes the Nova Roller Door, Nova-I. P. C Waterproofing Products, the Nova Shingle and Nova-Speed Shingling Clip and the Nova Loc-Nail. *Write for literature.*

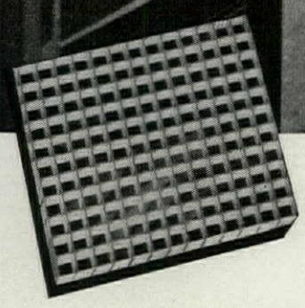
For Distinctive Shadowless Lighting . . .
CORNING FOTA-LITE



There's no denying the dramatic effect of a completely luminous ceiling whether for executive offices, stores, or commercial buildings. But, it must also be functional—provide a high level of illumination with low panel brightness. The unique properties of Corning Fota-Lite make it perfect for this type of lighting.

Fota-Lite gives you all the advantages of louvered lighting and flat glass combined. Vertical light is almost unrestricted, yet the diffusing louvers keep brightness level low—give the glass the appearance of plain opal. Non-color selective, Fota-Lite gives better quality light—transmits the true color of the light source.

Strong, light in weight and free of warpage, Fota-Lite is easily installed in shallow, dust-tight fixtures. And, unlike usual louvering materials, Fota-Lite can be cleaned with the wipe of a cloth—does not change color, scratch or attract dust. Available in widths up to 20″ and lengths up to 49″, Fota-Lite may be used in almost any application where louvering is desired.



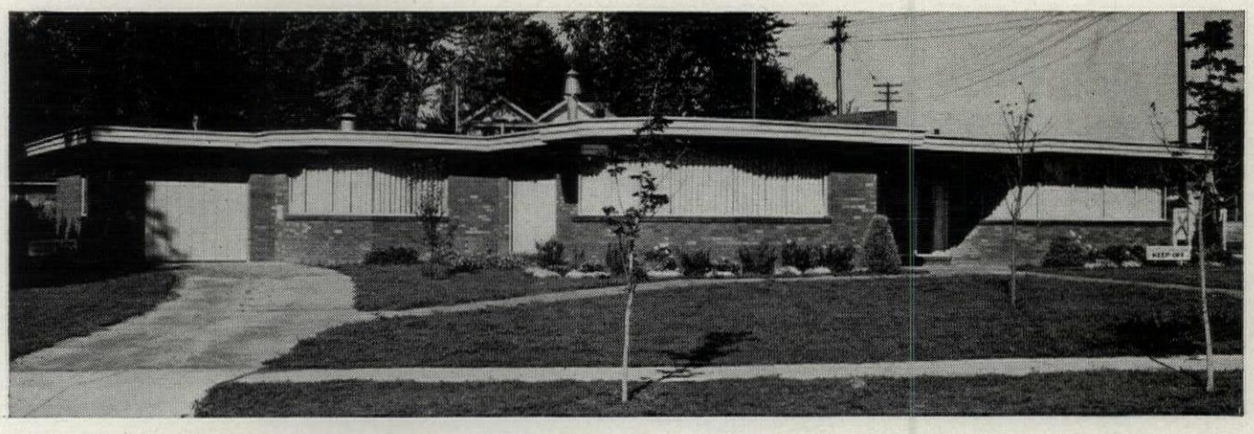
A remarkable new lighting medium, Fota-Lite controls the 45° cutoff by louvers photographically produced in a thin (⅛″) panel of glass. The tiny opal louvers are part of the glass itself —will not deteriorate with age or weathering—save metals—lower maintenance costs.

CORNING GLASS WORKS, CORNING, N. Y.

Corning means research in Glass

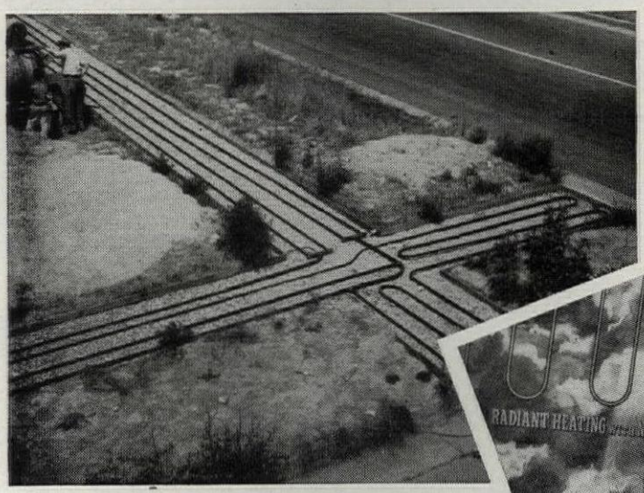
PYREX

1851 • 100 YEARS OF MAKING GLASS BETTER AND MORE USEFUL • 1951



A mile of pipe for a mile-high house!







Contains data for estimating heat losses, designing coil systems for floor *and* ceiling installations, typical coil patterns, testing procedures, fitting resistances, insulating techniques, pipe data and heat transmission tables.

• "Sun-Age Homes"* are well-known in mile-high Denver. Windows are big (over 40% of wall area). Plenty of storage space is built-in. The functional design makes for easy living. And—

Radiant heating is an important selling feature of every Sun-Age Home. Not just the interior, but the driveway and sidewalks of the house are heated with 6000 feet of NATIONAL *Steel* Pipe—the standard pipe for hot-water heating for over 60 years.

In the first 10 days that this sample home was displayed, over 8,000 adults visited it. *90%* of these people requested more information on radiant heating and snow melting. This intense public interest in the comfort and convenience of these systems has helped to sell a lot of Sun-Age Homes—just as it's helping to sell homes in every part of the country.

NATIONAL *Steel* Pipe is just the thing for an installation like this: It's economical. It's easy to weld. It's strong. Yet it's ductile enough to allow easy bending.

NATIONAL *Steel* Pipe has been widely used for radiant heating, so get the full particulars. This information is yours for the asking in our 48-page book, "Radiant Heating." Send the coupon now.

**Trade Mark, Reg.*

NATIONAL TUBE COMPANY, PITTSBURGH, PA.

COLUMBIA STEEL COMPANY, SAN FRANCISCO, PACIFIC COAST DISTRIBUTORS
UNITED STATES STEEL EXPORT COMPANY, NEW YORK

National Tube Company
Frick Building
Pittsburgh 19, Pa.

Please send your free Bulletin No. 19, "Radiant Heating."

Name_____

Company_____

Address_____

City & State_____

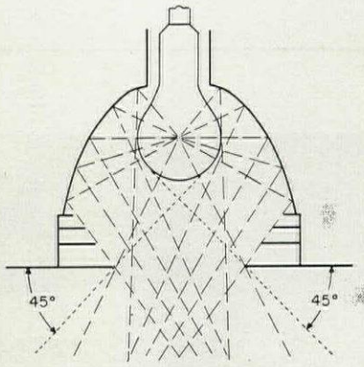
USS TRADE MARK

NATIONAL Steel PIPE

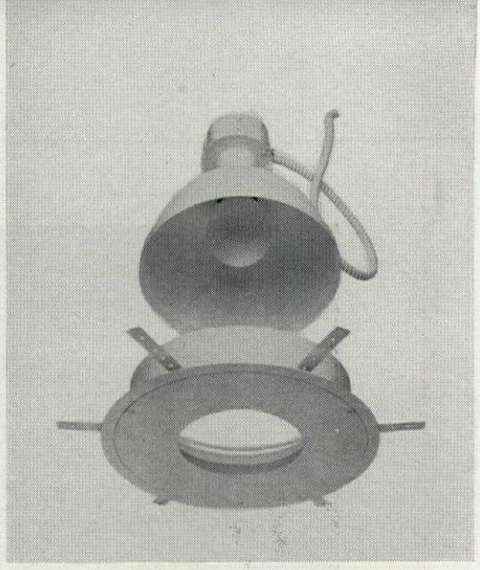
UNITED STATES STEEL

RECESSED LIGHT FIXTURE engineered for wide angle, low brightness distribution

Designed for use with inexpensive general service lamps, Gotham's new recessed Downlite comprises several noteworthy design features. When set in a plaster ceiling it is unostentatious because its metal trim is flush with the ceiling. In fact this trim can be painted over to give the visual impression that light is just coming through an aperture in the ceiling. The performance of the Downlite is its most important aspect. A polished compound curve reflector delivers all the light in a 90° cone. Annular horizontal baffle plates coated with a black matte finish are fastened near the lower portion of the interior to trap the light spill and help eliminate brightness at and around the opening. There is no brightness at any angle above 45° from the vertical; thus the fixture can be considered practically glareless. The Downlite is made in two sizes. Model 811, priced at $25.92, will accommodate a 100 w. inside frost lamp. Selling for $44.16, Model 831, will take a 200 or 300 w. lamp. No parts of the fixture need be removed while replacing a burnt-out bulb.



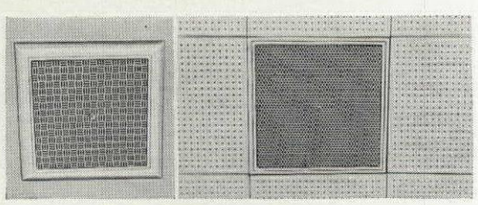
This simple recessed ceiling fixture limits the light distribution so that there is a low brightness contrast with surrounding areas.



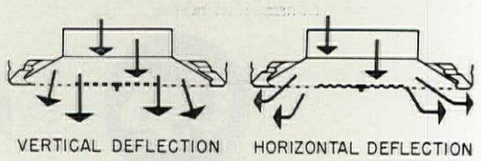
Manufacturer: Gotham Lighting Corp., Long Island City 1, New York.

SQUARE CEILING OUTLET is adjustable for horizontal or vertical air deflection

Two air conditioning outlets recently introduced by Barber-Colman feature easily regulated air distribution. One model is styled and sized to fit in a standard acoustical tile ceiling. It has a grille pattern which blends with perforated tile.



The other ceiling outlet has a geometric grille and a flange for installation in plaster ceilings. As normally supplied, the outlets provide full 360° distribution but can be ordered with air pattern control plates which may be used singly or in combination to give one, two or three way discharge. Either unit can be adjusted from vertical to horizontal air supply very simply after installation by turning a control disc in the center of the grille. When the disc masks the holes in



the outlet plate, air is deflected horizontally; when the holes are aligned with those in the mesh, air is discharged vertically. None of these adjustments alters the outward appearance of the

(Continued on page 222)



for lightweight concrete... use

WAYLITE AGGREGATE

Save up to 35% in deadweight... design up to 4,000 psi

When you want lightweight structural concrete with adequate strength, specify the use of Waylite aggregate.

Waylite is a cellular aggregate made by processing molten slag. Its air cells are completely sealed giving lightness and strength. Design for strength with Waylite as in ordinary plain or reinforced concrete. Handles similarly. Approved by Board of Standards and Appeals, New York City. Waylite Concrete 2,000 psi weighs 100 pounds per cubic foot . . . 4,000 psi Waylite weighs 108 pounds.

Waylite offers many important economies and advantages in structural design. Also widely used as floor and roof fills. See data in Sweet's—for additional information and quotations write The Waylite Co., 105 W. Madison St., Chicago 2, or Box 30, Bethlehem, Pa.

WAYLITE AGGREGATE

PAINE REZO DOORS

T. M. REGISTERED

are *Unconditionally Guaranteed*

and here's what makes that guarantee good



The World's Largest Mills

Devoted Exclusively To The Production of Hollow Core Doors



There are two sides to any guarantee. The words you read . . . and the resources that back them up. From this point of view consider the Paine Rezo Door — a door made and sold on the basis of *satisfactory service*, without reservations.

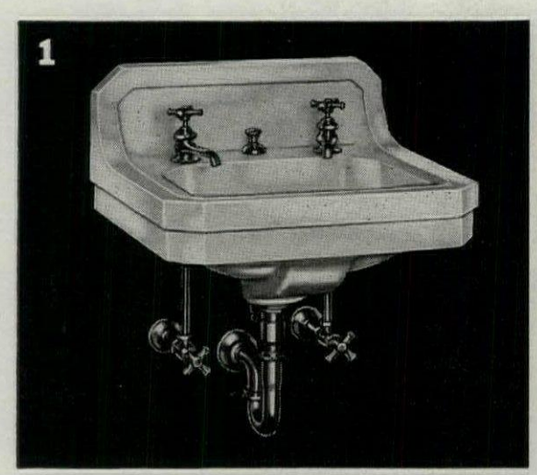
This unconditional guarantee has been time-tried and time-tested by more than 4,000,000 installations . . . a demand originating from architects and contractors so persistent and so repetitive that the world's largest mill work plants are now fully occupied producing Rezo doors exclusively.

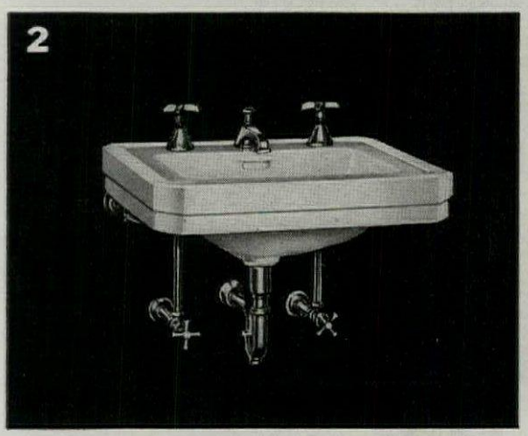
When your plans call for Paine Rezo doors, you're looking forward to a positive future. See SWEET'S catalog — or write for an illustrated data bulletin.

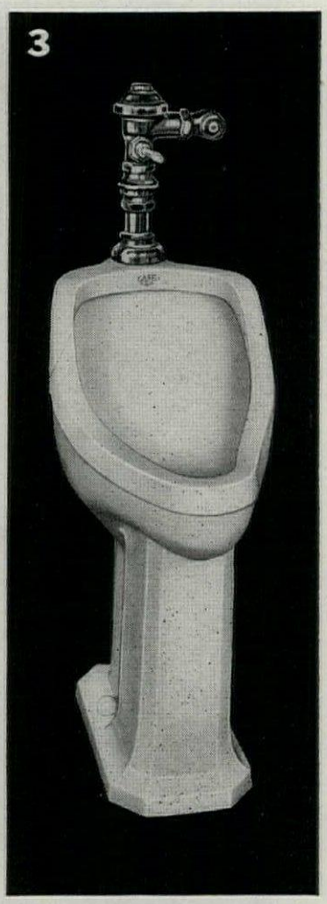
Manufactured by the

PAINE LUMBER CO., LTD. *Oshkosh Wisconsin*

ESTABLISHED 1853

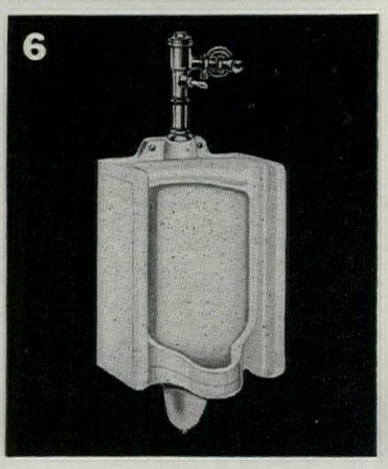












They make busy washrooms easier to keep **clean**

You'll get thanks every time, when you point out that the installation of Case quality washroom fixtures helps to hold down washroom maintenance cost.

It's easy to keep these fixtures clean and to *clean around and under them.* They are specially designed and made of finest vitreous china—highly lustrous and unsurpassed in permanence, sanitation, and resistance to acids and discoloration.

An added factor in long service life is the excellent mechanical construction of Case fixtures. Fittings are especially designed for the needs of individual fixtures. Fixtures are available with chair carriers—a wise safeguard in many installations.

Your Case distributor will do his best to serve your needs at all times. For his name, consult your Classified Telephone Directory under "Plumbing Fixtures"—or write W. A. Case & Son Mfg. Co., 33 Main St., Buffalo 5, New York. Founded 1853.

1 AVON* #900. Wall hung vitreous china lavatory with back. Square basin, front overflow, anti-splash rim.

2 CASE WYNGATE* #600. Lavatory. Square basin. Anti-splash rim, heavy wall hanger.

3 CASCO* #2335-A. Vitreous China Siphon jet pedestal urinal with chrome plated flush valve, vacuum breaker.

4 CASE #1600. Siphon Jet Flush Valve Closet Combination with elongated bowl.

5 CASE WALJET* #2100. Wall hung Siphon Jet Closet with hard rubber open front seat, concealed check hinge.

6 CASE CASCO* #2325-A. Vitreous China Wall Hung Washout Urinal with shields, integral flush spreader and spud.

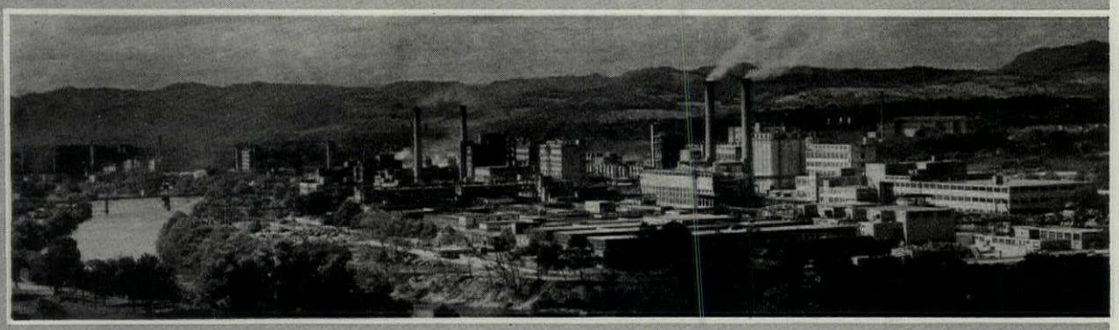
*®

Case

Fine Vitreous China

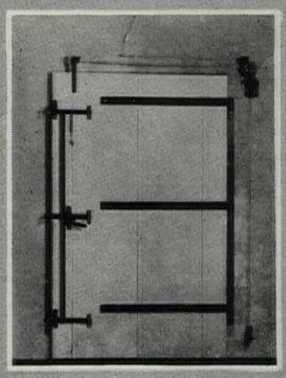
At Tennessee Eastman Company

DIVISION OF EASTMAN KODAK COMPANY



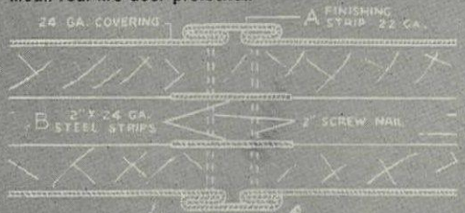
it's RICHMOND Fyrgard and Kalamein Doors

for **surer fire protection and better design**



Single-swing Fyrgard Door

Twice thicker steel side sheets mean real fire door protection



You will find many Richmond Door installations in this great, modern plant which is a large producer of cellulose ester plastics, acetate yarn and staple, and industrial chemicals. As the plant has continued to expand, Tennessee Eastman has continued to order Richmond Fyrgard Doors and Richmond Kalamein Doors. For years, Richmond products have been giving satisfactory service at Tennessee Eastman.

And so it is all over the country in plants that know and value the surer fire protection and better architectural design of Richmond Doors.

There are time-tested Richmond Doors for many industrial and commercial purposes — single- and double-swing or single- and double-slide Automatic Fire Doors — Kalamein Doors — Industrial Steel Doors. Also Unit Steel Frames.

If you are planning to use fire doors on any project, be sure to write for Service Sheet R5.

RICHMOND Fyrgard door

THE RICHMOND FIREPROOF DOOR COMPANY
RICHMOND, INDIANA
an affiliate of **THE PEELLE COMPANY**

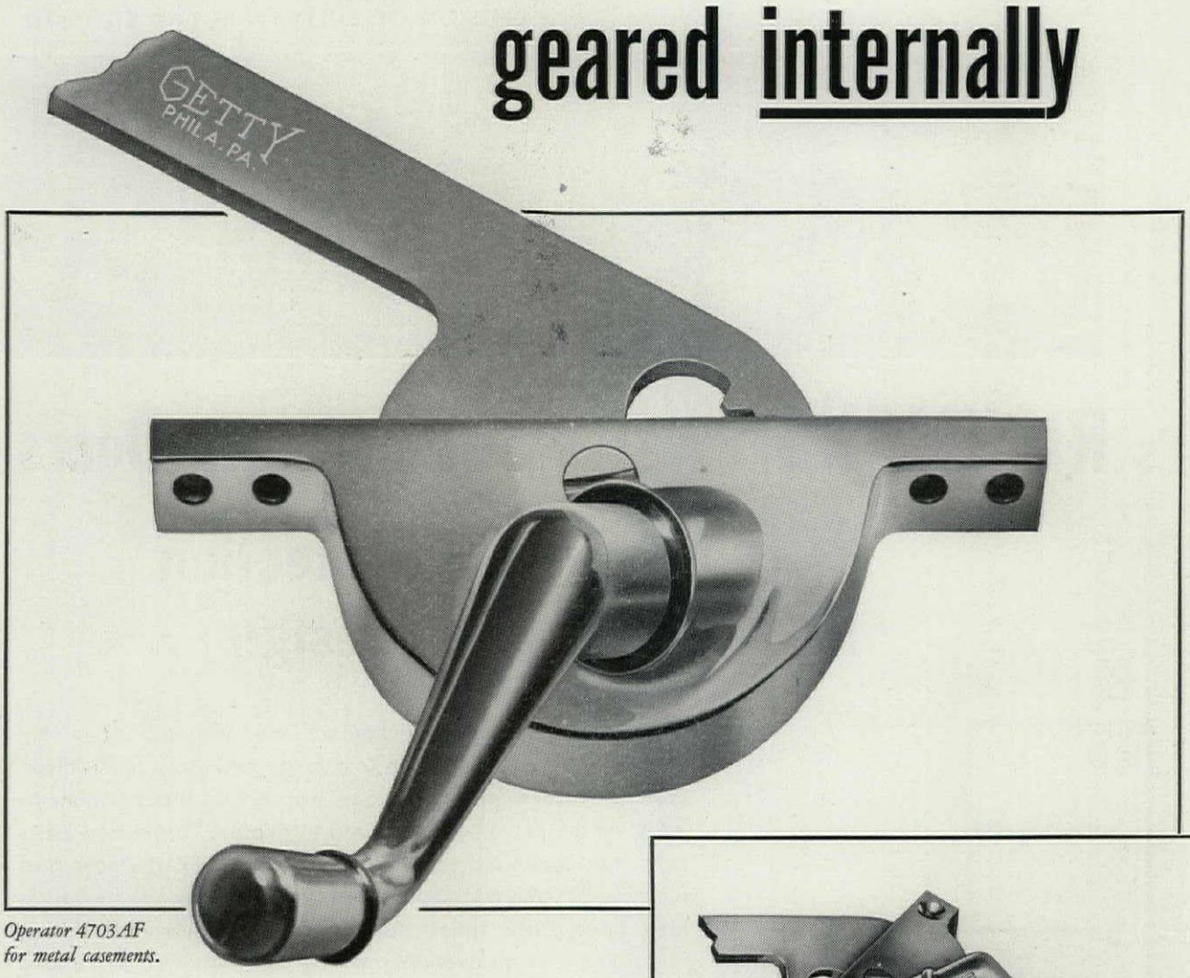
"it's **PEELLE-RICHMOND** *engineered"*

SEE OUR CATALOG IN SWEET'S

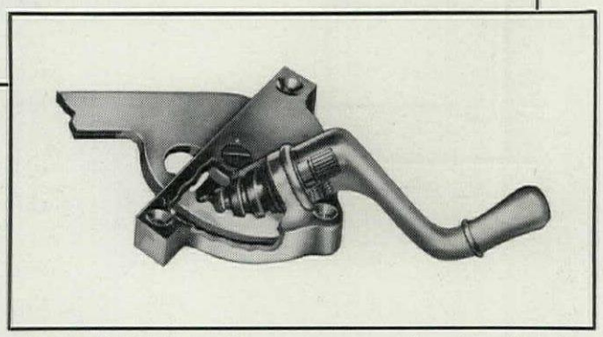
AUTOMATIC FIRE DOORS • KALAMEIN DOORS • INDUSTRIAL STEEL DOORS • UNIT STEEL FRAMES

THIS IS THE ONLY OPERATOR MANUFACTURED THAT IS

geared internally



Operator 4703AF for metal casements.



Operator 4703W for wood casements—cutaway shows internal gearing.

Internal gearing, an exclusive GETTY feature, provides greater power than any other method, because it permits the entire length of the worm to be engaged at all times with the gear teeth.

That's why this GETTY operator responds to the slightest turn, moves the casement window quickly and easily, locks it securely in any position, and provides years and years of faithful, trouble-free service.

Leading metal casement manufacturers will install GETTY operator 4703AF on request.

And so we ask architects and builders to add this small but significant phrase to their specifications and orders: "GETTY Operator 4703AF on all metal casement windows."

H. S. GETTY & Co., Inc.

3348 NORTH 10th STREET • PHILADELPHIA 40, PA.

see our CATALOG in SWEET'S FILE ARCHITECTURAL

GETTY OPERATORS ARE FOUND ON MORE CASEMENT WINDOWS THAN ALL OTHER OPERATORS COMBINED

In-wall

MULTIPLE USE-OF-SPACE EQUIPMENT



Activities area can be converted to lunch room for 200 in 8 minutes. It's the logical solution to the problem of high building costs and increased enrollments. May we send you complete information?

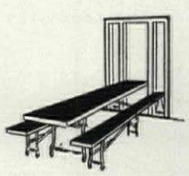
Schieber Manufacturing Co.
12738 Burt Road
Detroit 23, Michigan

In Canada
La Salle Recreations Ltd.
945 Granville Street
Vancouver, B. C.

see our CATALOG in SWEET'S FILE ARCHITECTURAL



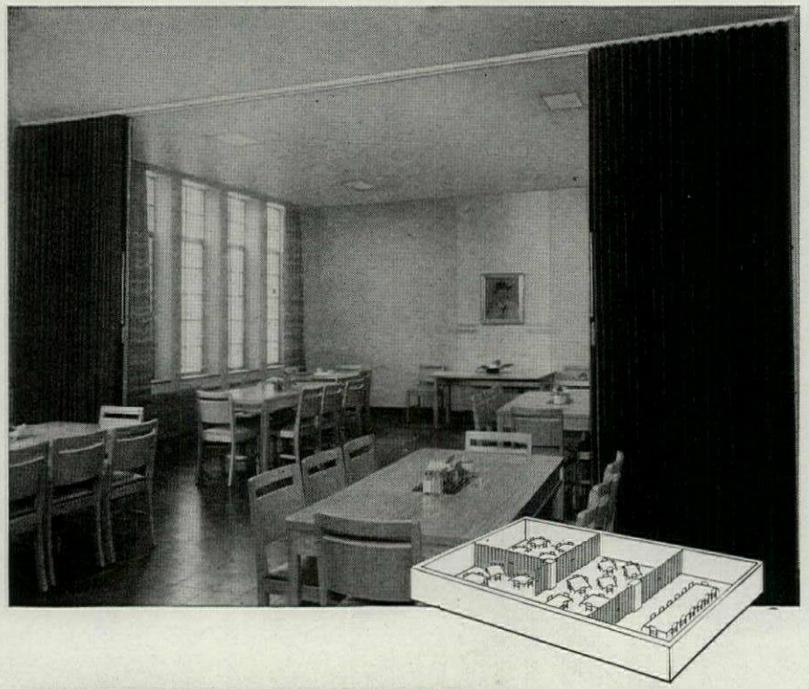
Easy to roll out from wall





Easy to roll back into wall

How many classrooms in a cafeteria?



"MODERNFOLD" DOORS have the answer

You're looking into a college cafeteria that leads a double life. At lesson time the "Modernfold" doors fold together to form much needed classrooms. At lunch time these steel-framed, accordion-type doors fold back to the wall—and quickly convert the classrooms into a cafeteria.

You keep clients happy when you give them more room—without having to add costly extra floor space. And that's exactly what they get when you specify "Modernfold" doors. As shown above, they're a "natural" for economical and flexible room division. And, as conventional doors, they *save the space that swinging doors waste.*

Economical? Definitely. "Modernfold" doors are moderate in first cost, and maintenance is practically nothing. Their handsome vinyl covering—in colors to match any decorating scheme—is fire-resistant . . . resists chipping, peeling, cracking, and fading . . . washes clean with soap and water.

For further information, mail the coupon or look up our distributor under "doors" in your classified directory.

Sold and Serviced Nationally
NEW CASTLE PRODUCTS
NEW CASTLE, INDIANA
In Canada: Modernfold Doors, 1416 Bishop Street, Montreal



the doors that fold like an accordion
modernfold DOORS
by NEW CASTLE

New Castle Products
P.O. Box 809
New Castle, Indiana
Gentlemen: Send information on "Modernfold" doors.

Name.....

Address.....

City.....*County*.....*State*.....

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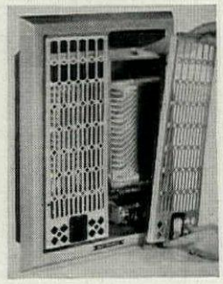
PRODUCT NEWS

unit. Approximate cost of the new outlet is about $13. Both models are made in a variety of finishes to match interior surroundings.

Manufacturer: Barber-Colman Co., Rockford, Ill.

WALL MOUNTED ELECTRIC HEATERS permit room-by-room temperature control

Equipped with a three position (high-off-low) switch similar to those used on electric ranges, these electric wall heaters can be regulated easily for varying temperatures throughout the house. Because the control is precise, operation is more economical than conventional *on-off* electric heaters. The new units are designed for wall mounting and come in four widths which fit between normally spaced studs. Installation is similar to that of a convenience outlet but in a bigger hole: the ruggedly constructed box is recessed into a wall opening 20½" high and 3⅞" deep, with the welded steel frame mounted flush against the finished wall.

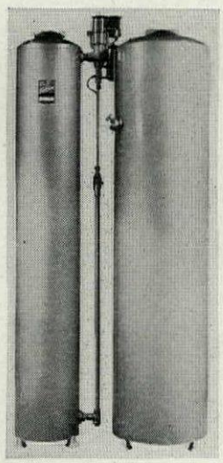


Prices of the new home heaters, with gray enamel frames and anodized aluminum grilles, range from $51 for the 1000 w. model having an hourly output of 3,413 Btu, up to $105 for the 6000 w. The line heats by both radiation and convection, emitting infrared rays and causing continuous circulation of heated air. The heating elements are of nickel chromium, supported through their entire length by ceramic columns. Large plated steel terminals are said to prevent burn-off. All models are approved by Underwriters' Laboratories.

Manufacturer: Westinghouse Electric Corp., Sunnyvale, Calif.

AUTOMATIC WATER SOFTENER has plastic lining

Lined with rust and corrosion resistant baked plastic, the Webb Hydrojet is a practically maintenance-free water softener for home use. Under normal water hardness conditions, the brine tank requires salting about once a year. The softener runs on 110-120 v., 60 cycle, and is engineered to operate at pressures as low as 15 psi. All fittings are of copper, brass or bronze. The complete equipment takes up a space 60" high, 17" deep and 30" wide. Price for the Hydrojet is $418, f.o.b. Los Angeles.



Manufacturer: Webb Mfg., 3454 Vosburg St., Pasadena 8, Calif.

(Continued on page 228)

OAK FLOORING IS PREFERRED by 85% of all prospective home owners for these reasons:



USE OAK: for low-cost homes

USE OAK: for medium-priced homes

USE OAK: for apartments

USE OAK: for luxury homes

- Oak is *durable.* It takes the weight of furniture and foot traffic better than any other flooring material.
- Oak is *economical.* It lasts the life of the house. No replacement of worn out spots is necessary.
- Oak is "*healthy.*" It has a natural insulating quality that works both in summer and winter. Also, Oak is so easy to keep clean.
- Oak is *adaptable.* No matter what type of house, what style of decorating, oak harmonizes better than any other floor.
- Oak is "*price-right.*" From low-cost to the most expensive homes, there is a grade of oak in every price bracket.

Oak is the only flooring that meets these five essential flooring needs —durability, economy, ease of maintenance, adaptability and healthfulness. That's why it is the overwhelming choice of 85% of all prospective home owners. National Oak Flooring Manufacturers' Association, Sterick Building, Memphis 3, Tenn.

OAK IS THE FLOORING THAT HAS EVERYTHING EVERYONE WANTS

There is a growing trend to show more Oak . . . Marie Stoskopf, A.I.D., Decorator. Photo, Hedrich-Blessing





How to Sell Yourself With The Houses You Build

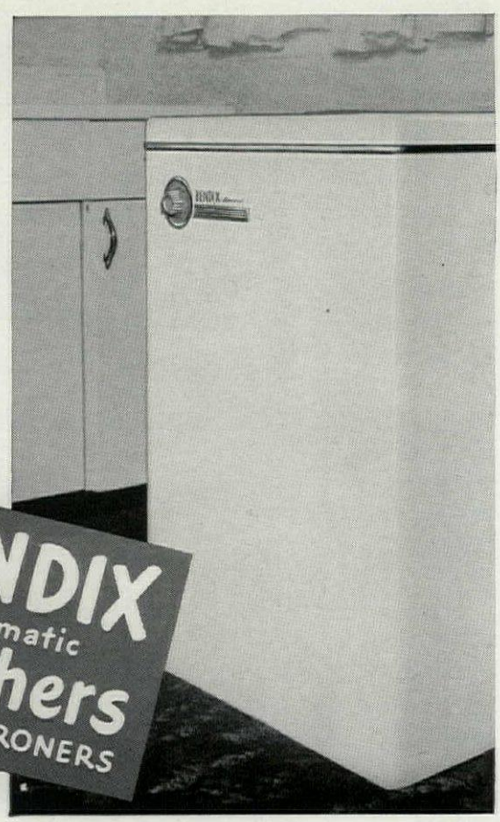
Clarence W. Gosnell
Director, National Association of Home Builders
Head of Clarence W. Gosnell, Inc., and Associates

Meet a builder's builder. A man who knows how to put his building dollars where they do the most good—for his customers and for himself. Bucknell Manor, in Fairfax County, Virginia, is a good example. 215 Gosnell-built homes are planned for good living—and extra value. And every one includes a Bendix automatic Washer.

"Why bother?" you say, "I can sell anything with four walls and a roof!" Sure you can—*today*. But when tomorrow comes, it's the builder who's sold himself as a man who gives solid values, careful planning, freedom from work who will continue to build and sell when the market swings the other way.

America's top-notch builders—its look-ahead builders—men such as Levitt and Gross and Gosnell and scores of others—plan a place *in the blueprint* for a Bendix automatic Washer, and, in many instances, a Dryer! A Bendix appliance in your homes adds only pennies per month on a package mortgage plan—yet it's one of the greatest "nudges to buy" the building industry has yet seen. Check on the Bendix story with your nearest Bendix distributor. Write us for his name.

See Bendix "Chance of a Lifetime" over ABC-TV—
Check your local paper for time and station.



Bendix is participating in the Good American Home program



BENDIX HOME APPLIANCES, Division Avco Mfg. Corp., South Bend, Indiana

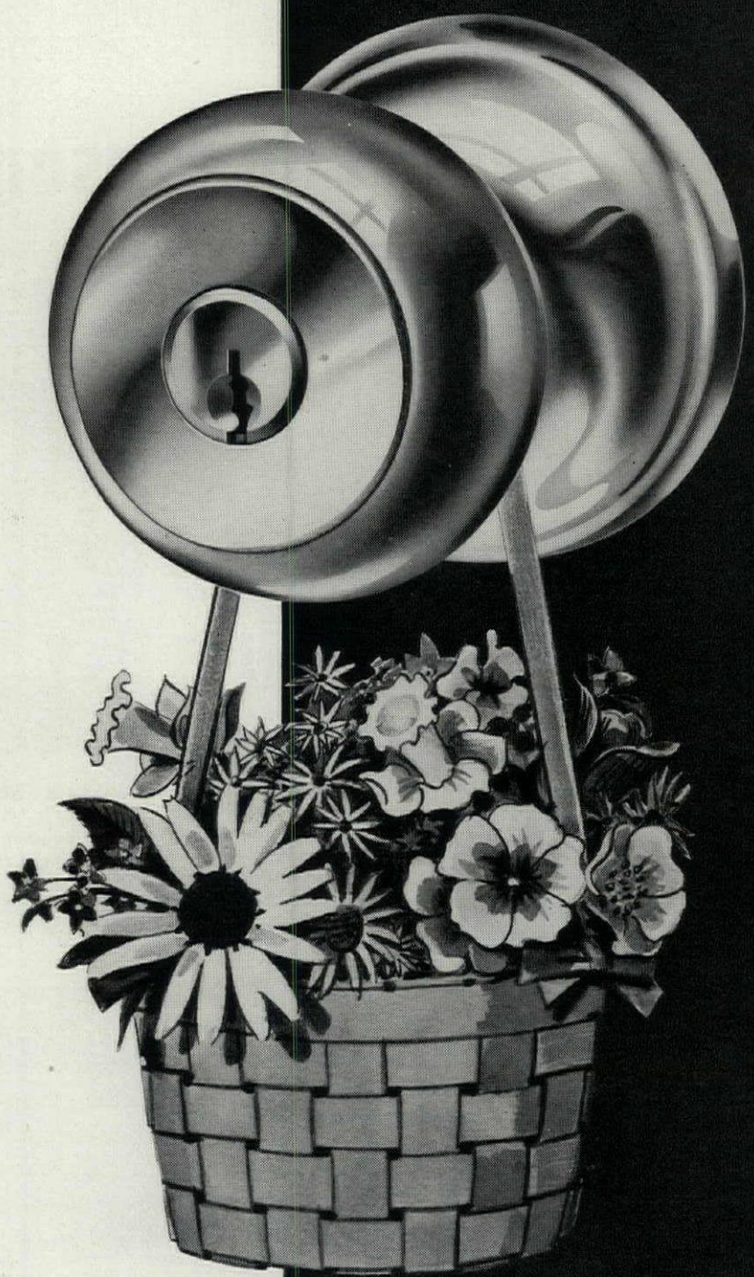
"Extras" that make a hit

RUSSWIN
Extra QUALITY
Tubular Locks and Latches

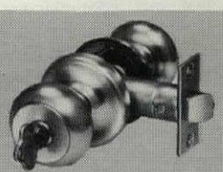
Check the many unique quality features of Russwin tubular locks and latches . . . the exclusive ball-bearing cylinder . . . the exclusive rack and pinion construction . . . the wrought steel case for working parts . . . check them all, right down the line. These add up to the quality *extra* which you can offer your customers at no extra cost. This means a better "buy" for your customers . . . better business for you.

Russwin tubular locks and latches are easy to install. They're available in smart designs and finishes for every door in the house. You can recommend them with full confidence that they're "tops" in quality . . . typically Russwin.

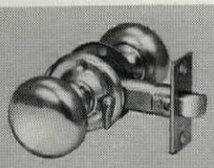
Have you a supply of the latest folder? Write Russell & Erwin Division, The American Hardware Corporation, New Britain, Conn.



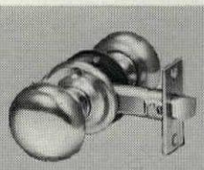
A MAY CUSTOM IN NEW ENGLAND . . . hanging a small basket with a gift, like flowers, on the door of a favored friend.



"Keynob" Locksets . . . Exterior Doors



Bedroom-Bathroom Locksets . . . with Automatic Safety Release



Inside Door Latchset

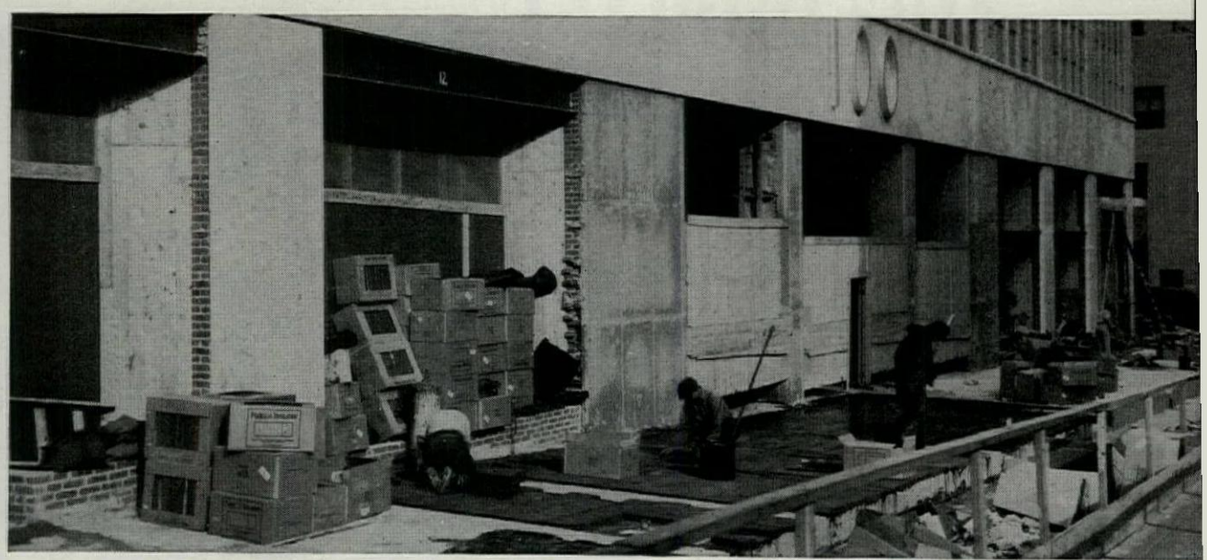
SINCE 1839

RUSSWIN

DISTINCTIVE HARDWARE

Proving the Economy of Quality

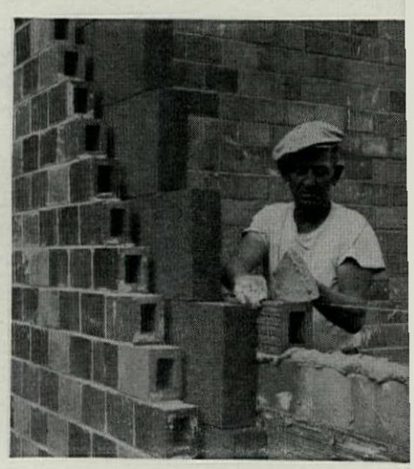
Four reasons for recommending



● Sidewalks around the new office building at 100 Park Avenue, New York City, are radiant heated to assure prompt melting of snow and ice. An important aid to the efficient operation of this system is the layer of PC Foamglas installed under the piping. Architects: Kahn and Jacobs, New York City.



● PC Foamglas is used to insulate this roof of the new, modern synagogue for Adas Israel Congregation, Washington, D. C. Architects & Engineers: Frank Grad & Sons—General Contractors: M. Cladny Construction Co., Inc.—Roofer: Warren-Ehret Company—all of Washington, D. C.



● PC Foamglas is widely used for free-standing walls and partitions and in corewall construction between inner and outer masonry as shown here at the new meat processing plant of Stadler Packing Company, Inc., Columbus, Ind. Foamglas acts as a long lasting barrier to vapor and heat transfer . . . helps maintain required operating temperatures. Architects: Johnson and McKenney, Columbus, Ind.

PITTSBURGH ® PC CORNING

FOAMGLAS cellular

. . . WHEN YOU INSULATE WITH FOAMGLAS . . . THE INSULATION LASTS!

PC Foamglas

THE LONG LIFE INSULATION

1 FOAMGLAS EMBODIES A BASIC INSULATING PRINCIPLE

It consists of still air sealed in minute glass cells, assuring constant insulation value.

2 FOAMGLAS IS MADE OF DURABLE MATERIAL

Glass has unusually high resistance to moisture, vapor, chemicals and many elements that cause other insulating materials to deteriorate.

3 FOAMGLAS IS ADAPTABLE

It is serving effectively on roofs and ceilings, in walls, under floors and sidewalks.

4 FOAMGLAS IS ECONOMICAL

Its long lasting, trouble-free effectiveness makes Foamglas the least expensive insulating material you can recommend.



The growing preference for this unique, cellular glass insulating material is evidenced by a long list of prominent users. We have published booklets in which illustrations of representative jobs supplement the informative text. Just send in the convenient coupon for your free copies and a sample of PC Foamglas.

PITTSBURGH CORNING CORPORATION
PITTSBURGH 22, PA.

← ● Its high compressive strength enables PC Foamglas to withstand normal floor loads when installed under wearing surfaces. Here, workmen are applying Foamglas on the floor of a film storage room at the new Eastman Kodak Company branch, Dallas, Texas. Foamglas also lines the walls and ceiling of this room. Architects: Thomas, Jameson and Merrill, Dallas, Tex.

PC Foamglas is composed of still air, sealed in minute glass cells. It is light-weight, incombustible, verminproof. The insulating properties of still air and the resistance of glass to elements that cause other insulations to deteriorate, make Foamglas an exceptionally effective, long lasting insulating material.

Pittsburgh Corning Corporation
Dept. C-51, 307 Fourth Avenue
Pittsburgh 22, Pa.

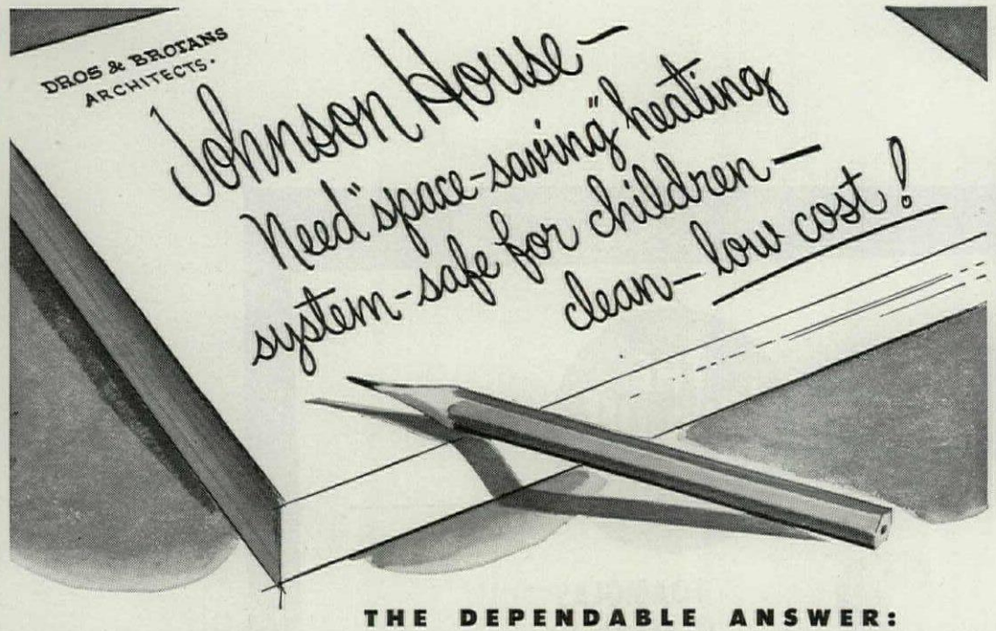
Please send me without obligation a sample of Foamglas and your FREE booklets on the use of PC Foamglas for: Homes ☐, Normal Temperature Commercial, Industrial and Public Buildings ☐ Refrigerated Structures ☐.

Name_____

Address_____

City_____ State_____

glass INSULATION



THE DEPENDABLE ANSWER:

Specify Stewart-Warner "Safety-Sealed" GAS HEATING

New Room-Size Units . . . Need No Chimney, No Ducts
No Electricity . . . Bring Zone-Controlled Heating Comfort
To Every Room With New Safety, Thrift, Convenience!

All of central heating's advantages—without central heating cost! No chimneys, no ducts required! Manual or thermostatic controls for safe, clean zone-controlled heat in every room! Is it any wonder why more and more architects and builders are choosing "Safety-Sealed" gas heating?

Highly flexible in use . . . fully automatic . . . each "Safety-Sealed" unit is a completely independent gas heating system. Installation—in any exterior wall of brick, wood or cement block construction—is quick, easy, really low in cost! Upkeep . . . maintenance? Always at a minimum. "Safety-Sealed" units have no moving parts to maintain or replace. Operate dependably for years on either natural, manufactured or LP gas.

Compact! "Safety-Sealed" units waste no floor or closet space. All-aluminum interior panel extends only 4 inches from wall surface. Connects directly to the small Lundstrum Vent on the exterior wall. Simple modern design suits any interior. Both 14,000 and 20,000 BTU capacity models are available.

New, Positive Safety! Only "Safety-Sealed" units provide the patented exterior wall vent that draws all combustion air from outdoors, then vents all combustion products outside for dissipation. Room air is never used for combustion. Walls are protected against damaging excessive humidity.



Model 991-14 (shown) 18" x 24"

Model 992-20 18" x 38½"

WRITE NOW for complete FREE information and specifications on this latest development in modern gas heating. Mail coupon below today!

STEWART Safety Sealed WARNER
DOMESTIC HEATING

MAIL COUPON TODAY!

Approved by American Gas Association. Also listed by Underwriters' Laboratories and accepted for Veterans' Housing and F.H.A. financing.

Stewart-Warner Corporation, South Wind Division
Dept. K-51, 1514 Drover Street, Indianapolis 7, Indiana

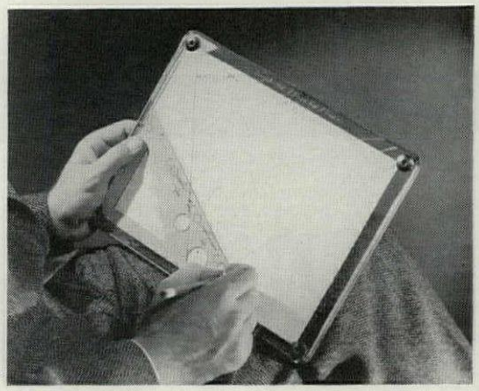
Please send me specifications and complete details on "Safety-Sealed" Saf-Aire Gas Heating Units.

NAME_____

ADDRESS_____

CITY_____ ZONE____ STATE_____

PRODUCT NEWS



PLASTIC DRAWING BOARD can be carried easily in briefcase

The Graphostat portable drawing board should have interest for architects and engineers who make small sketches in the field. Made of a single molded 9¾ x 12¼" piece of clear styrene plastic, the board has four corner clamps for attaching 8½ x 11" paper. It is unnecessary to use thumb tacks. The clamps are cleverly recessed into the plastic so that the triangle can ride freely over them without interference. Metal straight edges at two sides of the board (one vertical and one horizontal) are retractable so that the triangles can be moved over all four edges of the paper. Lightweight, the board can be carried easily in a briefcase. Triangles may be stored in recesses underneath the board and can be clamped securely in place. The high luster plastic presents an excellent long lived drawing surface with no thumb tack dents to cause bothersome drawing errors. The board is priced at $3.95.

Manufacturer: A. Patrick Co., 9 Grove St., Westwood, N. J.

PORTABLE MOISTURE DETECTOR reveals water content in building materials

Moderately priced at $75, this new meter can be used to detect the amount of moisture in wood, paint, plaster, concrete and other construction materials. Called the Delmhorst Model G, the instrument is small (4½ x 7 x 3¼") and weighs only 3¼ lbs. Its meter dial is large and legible, however, and gives the moisture content readings directly in percentages within a range of 7 to 35%. Electrodes can be interchanged for use with porous products such as wood and for surfaces—concrete, plaster, etc.—to determine moisture content before painting. An adjustable shoulder and neck strap enables the user to carry the instrument around comfortably, and facilitates a good reading position. Instead of the push button usually employed in a device of this type, the Model G has a switch which allows the operator free use of both hands once the detector is turned on. One standard B battery and one flash-light cell supply the power. When stored in its carrying case or when placed face down, the instrument turns itself off automatically.

Manufacturer: Delmhorst Instrument Co., Boonton, N. J.

(Technical Literature, page 290)

KAYLO®
INSULATING ROOF TILE



ROOF DECK FORMS A COMPLETED CEILING

Reflects Light...

Requires No Treatment

...No Painting

North Park School, Rapid City, South Dakota—Architect: Ewing & Forrette, Rapid City, South Dakota

Kaylo Insulating Roof Tile, with its combination of advantages, forms a better and longer-lasting roof deck—and a completed ceiling at the same time. The smooth under-surface of a Kaylo roof deck has a light reflection factor of approximately 80 per cent. The tile ceiling need not be painted.

Consider these additional advantages provided by Kaylo Insulating Roof Tile:

Incombustibility of Kaylo Tile protects against fire. The tile withstand building fire temperatures up to three hours and are still strong enough to be walked on.

Insulating Value eliminates the need for additional insulating materials under all but severe conditions. The tile provide insulating value equal to that of an inch and one-half of standard insulating board.

Structural Strength of Kaylo Insulating Roof Tile is more than adequate for typical roof loads.

Inorganic Composition of Kaylo Roof Tile, a calcium silicate (not glass), resists rot—moisture does not damage the tile.

Light Weight (only 5 lbs. per sq. ft.) permits the use of lighter, more economical supporting members and foundations. Kaylo Insulating Roof Tile provide simple fast construction of flat or pitched roofs. The tile are laid quickly and easily on steel sub-purlins or standard structural shapes, or may be nailed to wood joists. Standard roofing materials are used over a Kaylo roof deck.

See our CATALOG in SWEET'S FILE ARCHITECTURAL

For complete details on Kaylo Insulating Roof Tile, write Dept. N-117, Owens-Illinois Glass Company, Kaylo Division, Toledo 1, Ohio.

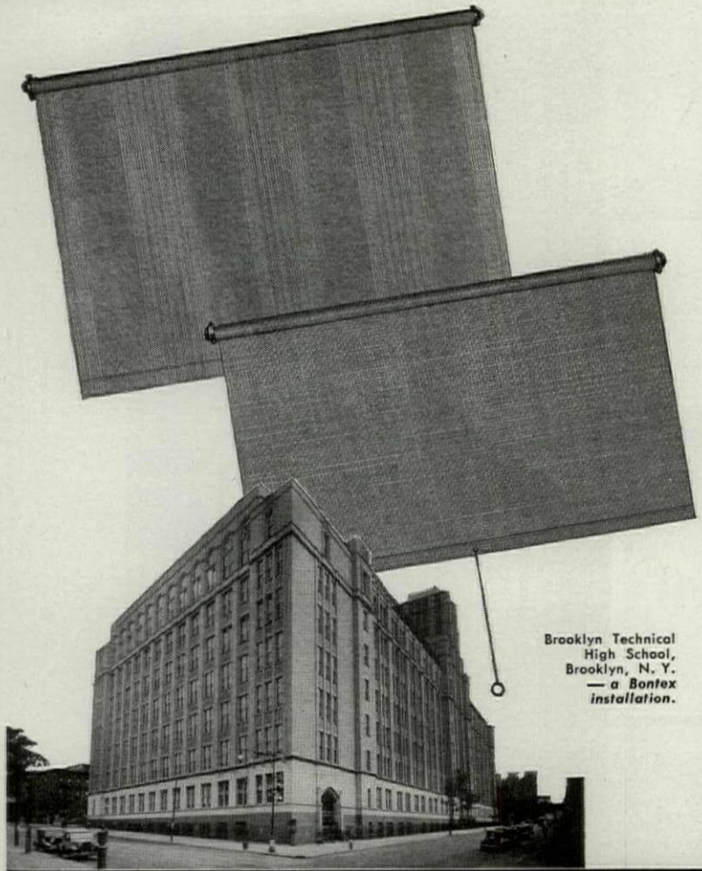


KAYLO® ... first in calcium silicate

...pioneered by OWENS ILLINOIS Glass Company

MAIN OFFICE: TOLEDO 1, OHIO—KAYLO SALES OFFICES: ATLANTA • BOSTON • BUFFALO • CHICAGO • CINCINNATI • CLEVELAND DETROIT • HOUSTON • MINNEAPOLIS • NEW YORK • OKLAHOMA CITY • PHILADELPHIA • PITTSBURGH • ST. LOUIS • WASHINGTON

Bontex window shades



Brooklyn Technical High School, Brooklyn, N. Y. — *a Bontex installation.*

better light . . . longer wear for every type of installation

The modern, complete Bontex line includes types of shades for every building, every purpose. Famous for beauty, long service and low-cost-per-year. Used in America's leading schools, hotels and hospitals . . . in finest apartments and homes.

There are Bontex Shades that let in soft, mellow light and Bontex Shades that shut out all light — Bontex pyroxylin shades, including a new darkening type — and Bontex vinyl shades that are flame resistant. Bontex Shades are the finest money can buy — tough and durable, won't pinhole, fray or crack. The colors are clear and uniform. The finishes are soft and beautiful.



Bontex Shades clean like new, can be scrubbed 20 times or more.

FREE Sample Book

Shows the complete Bontex line — newest types of shade cloth, sample swatches of all colors, miniature reproductions of the decorative printed patterns. Coupon will bring your Bontex Sample Book promptly.

Columbus Coated Fabrics Corporation, Dept AF-51, Columbus 16, O.

Send your 1951 Bontex Shade Cloth Sample Book

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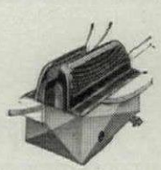
A. S. I. E. says

Coleman is the best of its kind

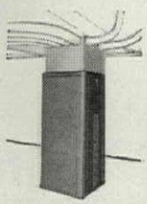
The American Society of Industrial Engineers has given The Coleman Company unusual recognition—a special Merit Award for the high quality of Coleman heating equipment. The Society has named it the outstanding line in America. Also noteworthy—this is the first time the Merit Award has been made to any manufacturer in the home heating industry. We are proud to be the first to receive it.

Comfort costs so little with a Coleman® America's leader in home heating

THE COLEMAN COMPANY, INC., WICHITA 1, KANSAS



FLOOR FURNACES



BLEND-AIR



SPACE HEATERS



GAS WALL HEATERS



WATER HEATERS



After a consultation with Columbus store planning service the result is this drug store that's the pride of Salt Lake City. Standardized Columbus floor and wall cases give a custom-built appearance and saved the client important money.

HOW THE COLUMBUS SHOW CASE COMPANY

helps the busy architect

If you are interested in shaving precious days from tight working schedules, without making a single concession in quality, it will pay you to talk with The Columbus Show Case Company.
Now the world's leading manufacturer of standardized store display units, Columbus renders a store planning service especially for architects. In fifty five years of assistance in store planning we have accumulated an extensive "warehouse of ideas," applicable to every class of retail trade, to every size store, to every merchandising motif.
Our experience can be yours, and for free. If Columbus Cases fit into your final plans, that's top-notch with Columbus. If not, no hard feelings, no questions asked. Our merchandise is display equipment . . . our stock-in-trade is service!

and here's proof

So that we can get down to brass tacks

MAIL THIS COUPON NOW

THE COLUMBUS SHOW CASE COMPANY
894 W. Fifth Ave., Columbus 12, Ohio

Gentlemen: I would like to know the "whys" and "wherefores" of your store planning service for architects.

_____Send your portfolio _____Send your representative

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Columbus salesmaster Cases

How You Save with the NEW Niagara Method of Air Conditioning

Using "HYGROL" Absorbent Liquid

Because it absorbs moisture from the air directly, the new Niagara Controlled Humidity Method uses less, or no, mechanical refrigeration for dehumidifying. You save first costs and installing of heavy machinery. You save space, maintenance expense, power; get easier, more convenient operation.

Using "Hygrol" absorbent liquid gives complete control of temperature and relative humidity. Especially, it is a better way to obtain dry air for drying processes, packaging hygroscopic materials, preventing moisture damage to metals, and obtaining better quality for chemical process and food products—or in obtaining better results in comfort air conditioning at lower refrigeration costs.

Filtered air is dehumidified by passing through a spray of "Hygrol" which removes airborne moisture. This liquid is non-corrosive; it contains no salts or solids to precipitate and cause maintenance troubles. It is continuously re-concentrated at the same rate at which it absorbs moisture, providing always the full capacity of the air conditioner, automatically.



Food Packaging under Controlled Humidity

Units provide a range of capacities from 1000 to 20,000 C. F. M. Multiple unit installations are in use successfully. Records of results are available. For further information, write Niagara Blower Co., Dept. AF, 405 Lexington Ave., New York 17, New York.

Grant Wilson

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ASBESTOS PROTECTED

- INSULATES DUCTS
- ABSORBS SOUND
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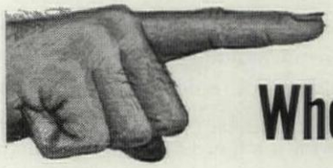
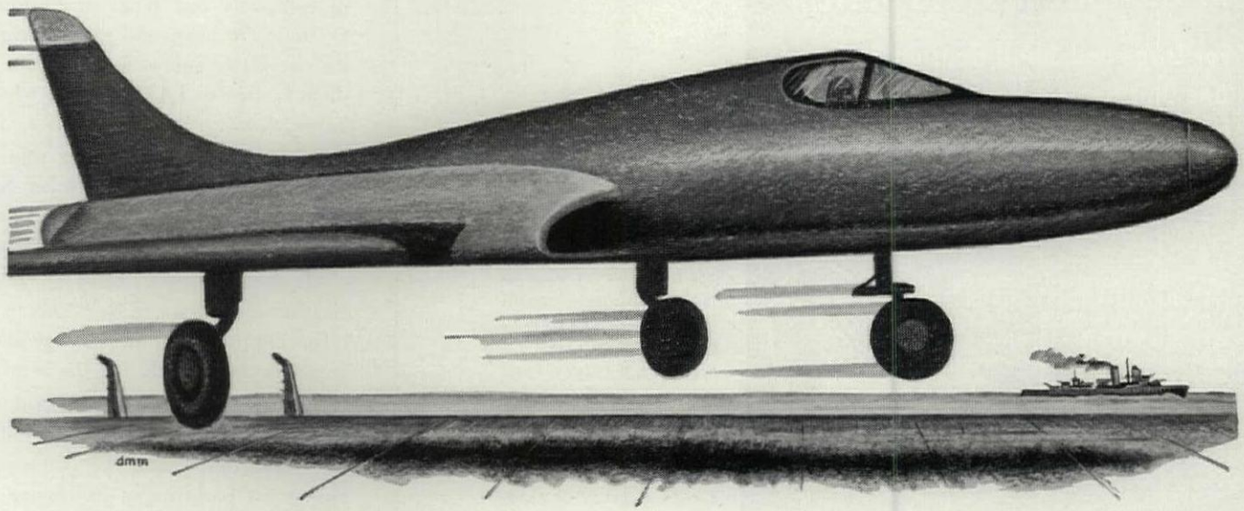


When Uncle Sam says, "GO!"



...let Barrett SPEED your Roofing Jobs!

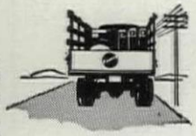
America's great armament program is going to call for a lot of speed in a lot of places. New plants will have to be put up—and old ones reconditioned—"almost over night."

This, in turn, is going to call for a great many new roofs. If you find yourself in need of a new roof in a *hurry*, you can't do better than to turn to Barrett. Barrett can give you the world's longest-lasting built-up roof in the shortest possible time. For Barrett *speeds* your roofing jobs in 4 important ways:

1 **Barrett speeds specifications.** Ready at hand are Barrett time-tested, scientifically calculated application specifications for almost every built-up roofing problem. These are so foolproof that Barrett* Specification* Roofs can be bonded for 20 years, and generally last much longer. Approved by the National Board of Fire Underwriters—Class A.



2 **Barrett speeds deliveries.** Strategically located supply points enable us to rush materials to your Barrett roofing contractor, and to your job when they are needed.



3 **Barrett speeds application.** Barrett does not have to rely on outside sources of supply for roofing pitch and felt. Because Barrett Specification* pitch and felt are made in our own factories, production can be controlled to meet demands. Your Barrett roofer can be sure that he will get the materials he wants when he needs them. No time lost on the job! Moreover, you can be sure that these materials will be of uniform high quality.



4 **Barrett speeds you the finest possible roof.** Skilled workmen make for fast jobs. Barrett Approved Roofers have had many years of practical experience, plus well-trained manpower, plus Barrett engineering help, to assure you the finest possible roofing job in the shortest possible time.



But don't wait until you're up against it before ordering necessary roofing work. Call in a Barrett Approved Roofer today, or write us.

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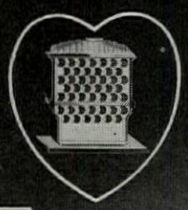
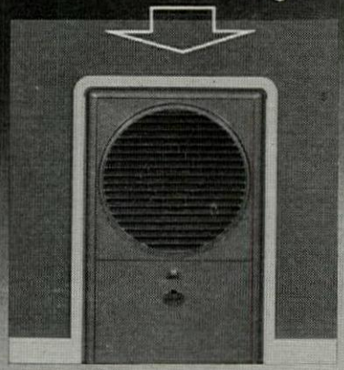
For Large and Small Housing Projects
One Unit Heats a House or Apartment
DISPLACES EXPENSIVE-TO-INSTALL DUCT SYSTEMS OR MULTIPLE INSTALLATIONS OF ORDINARY FLOOR, WALL, RADIANT, CIRCULATING HEATERS.

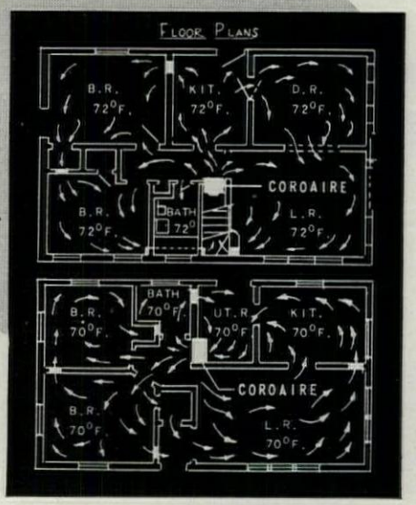
Exclusive patented feature —COROAIRE CAST-IRON VENTURI TUBE HEAT EXCHANGER—supplies 5 times greater heating surface —traps heat 5 to 1—unmatched efficiency and economy.



Completely automatic gas heat—forced circulation—humidification—filtration. NO COSTLY DUCT WORK... NO HARD-TO-OBTAIN SHEET METAL. Finished to blend into any decorative scheme. Installed cost less than a refrigerator or television set.



The new COROAIRE 90WM IN-THE-WALL Heating System...AGA approved...acclaimed by authorities and experts as the perfect answer to 3½ to 7 room, one floor, private, public, defense and military projects—homes or apartments.



Coroaire PATENTED The Scotch Heater

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Hi-Boy Furnaces...Hot Boy Space Heaters
Dept. PDM, 1422 Euclid Avenue,
Cleveland 15, Ohio

HOW TO SAVE STEEL

(Continued from page 113)

tions. Mr. Saxe says "it would have little relative effect except on very tall buildings or narrow buildings. Examples for interior bays, A, B and C hold good for both uniform and alternate bay loading.* The economies of D and E are figured for alternate bay loading.** For uniform bay loading, which can be used in relatively few types of buildings, Design D would cut beam and girder weights to 1,770 lbs. or 50% below A; Design E would cut them further to 1,433 lbs. or a whopping 59% below A!

Despite the much greater tonnage savings offered by D and E, Engineer Saxe reports Design C is cheapest in dollars in today's market.

"It should not be," he says, "but it is. Fabricators don't want to be bothered welding reinforcing plates, so they charge about twice as much as they should for the reinforcing."

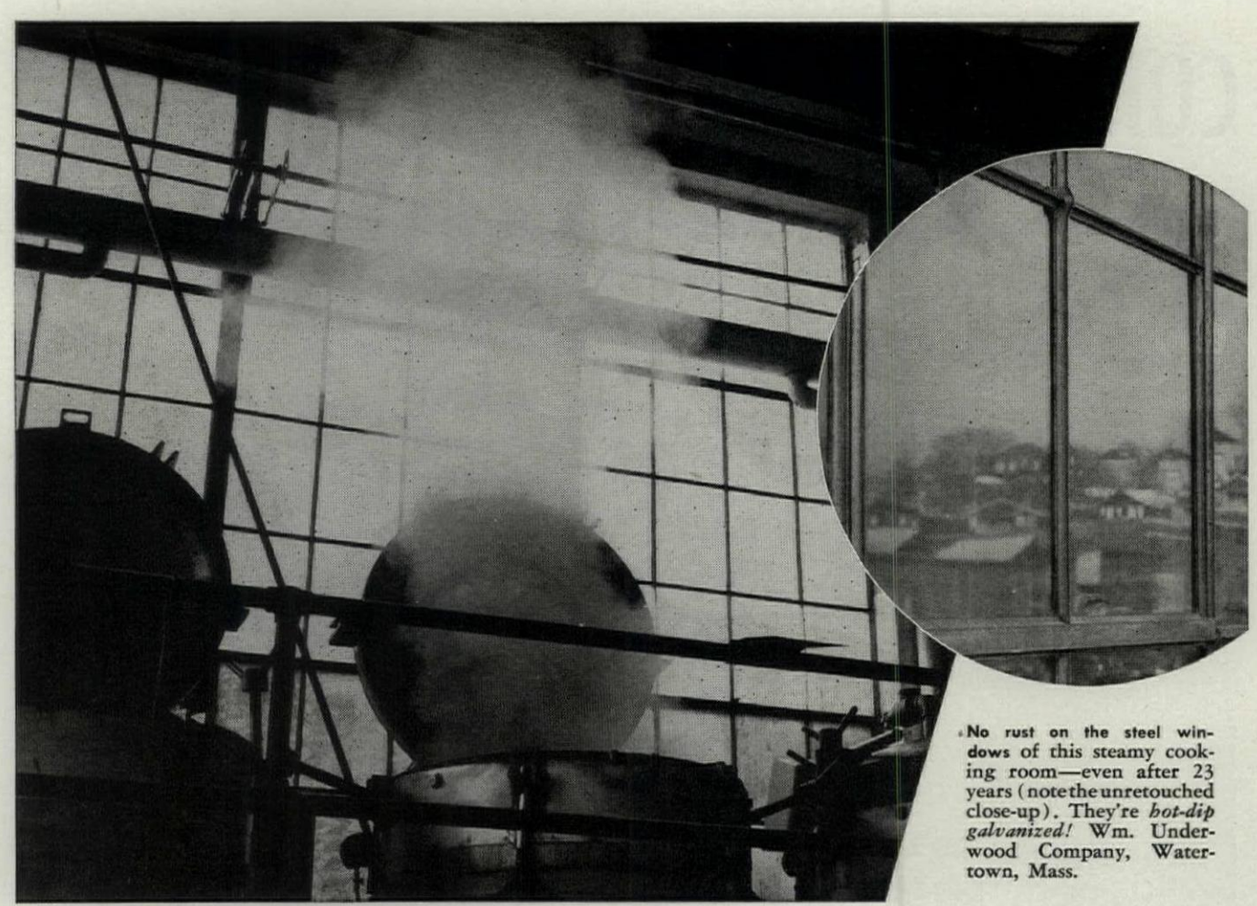
Saxe has designed some 1,500 welded steel buildings all over the East, including the new *Baltimore Sun* plant, the 465-unit Broadview apartment building in Baltimore and the 18-story Allied Arts office building in Lynchburg. "We used to design our jobs twice, once for riveting, once for welding, and then send both designs out for bids. Since the war we have never had a job on which the welding bid did not come in cheaper, so we don't often bother with a riveted design any more. For a simple design like C practically all the fabricators except Bethlehem quote the same price of about $225 per ton riveted or welded, so we can expect the same saving in dollars that we get in pounds. But when we design for reinforcing plates they run the price up so high that the 26% beam and girder tonnage saving in E over C ends up costing more money instead of less.

"If a builder can't save money by welding, it is usually because he has not paid his engineers to do a separate design for welding, has just asked welding prices on a design worked out for riveting."

Saxe also points out that the smaller steel members permit additional savings in the amount of concrete required for fireproofing.

Engineer Saxe's tonnage economy estimate drew little criticism from other firms, though one engineer did figure that Example A, the basis of the comparison, used slightly more steel than necessary because no standard shape fitted the theoretical minimum. Several builders commented that, however sound the theory, they had seldom been able to get welded prices as low as riveted.

* Live load to dead load ratio of 0-1.
** Live load to dead load ratio of 1.



No rust on the steel windows of this steamy cooking room—even after 23 years (note the unretouched close-up). They're *hot-dip galvanized!* Wm. Underwood Company, Watertown, Mass.

Even 23 years of steam didn't rust these steel windows

Those cooking caldrons spew out steam and soak the air with water. And back in one corner pans are washed with a steam hose.

Yet these steel windows in the Wm. Underwood Company, canned food producers, have not rusted in *23 years.*

Why? They were *hot-dip galvanized!*

Now here's the *really* big news! Fenestra* Engineers have developed a new hot-dip galvanizing system that does an *even better* job—and they've built a special new plant around it, the only plant of its kind in America. It has special tanks, special automatic controls—everything especially designed to give you the most *permanent, maintenance-free* windows made.

Galvanizing is done *after* assembly of window frames and assembly of ventilators (and after cleaning, rinsing, fluxing and drying)—so that every bit of exposed metal gets a locked-on protective coating. To make sure the zinc coating is uniform, windows are hung from a unique conveyor that completely immerses them in molten zinc in one deep dip. Then withdraws them at controlled speed.

Then the windows dip into the Bonderizing tank. Bonderizing gives them an attractive appearance and prepares the surface for immediate decorative painting if you *want* to paint them.

Check on these windows today. *Steel-strong windows made to STAY new* put real meaning in the term "maintenance free!" Call your Fenestra Representative (he's listed in the yellow pages of your phone book) or write to Detroit Steel Products Company, Dept. MB-5, 2251 E. Grand Blvd., Detroit 11, Michigan. *®

Steel-Strong Windows made to STAY new

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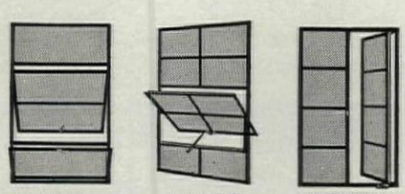
HOT-DIP GALVANIZED STEEL WINDOWS



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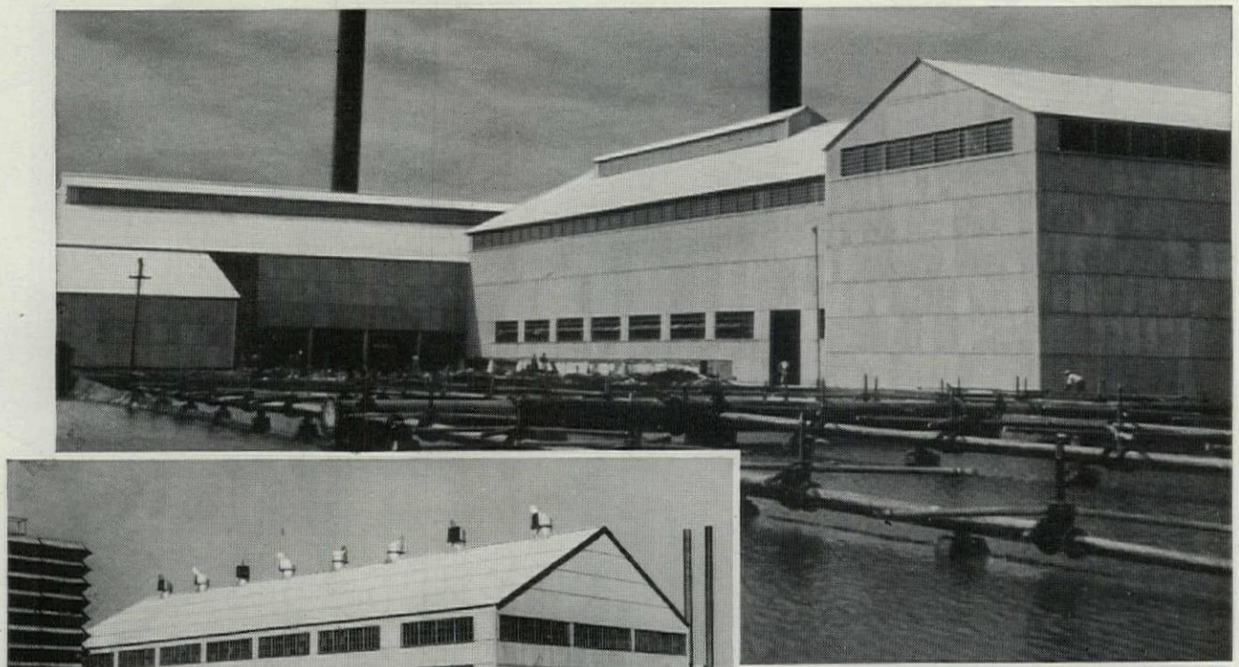
*Transite is a registered Johns-Manville trade mark



Above: Walls and roofs of Corrugated Asbestos Transite on a sugar refinery in the Dominican Republic

Left: High resistance to corrosive fumes makes Corrugated Transite a logical choice for the walls and roof of this gas plant in Texas

Long a favorite in the U.S.A., tough Asbestos Transite building sheets now have international acceptance

Fireproof, rotproof, weatherproof, Corrugated Asbestos Transite helps everywhere to achieve enduring construction, streamlined simplicity, lower construction and maintenance costs.

In war or peace, at home and abroad, Corrugated Asbestos Transite is a busy building material because it provides advantages that have universal importance.

These tough Transite sheets for walls and roofs are *maintenance-free* . . . can't rot, rust, or burn. Never need paint to preserve them . . . practically no upkeep, because they're made of materials that are virtually *indestructible*—asbestos and cement. The natural light gray color of Transite is attractive without further decoration.

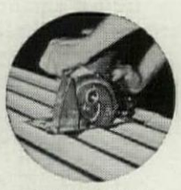
The large sheets go up fast, require a minimum of framing, lend themselves attractively to modern streamlined design. The corrugations cast pleasing shadow lines and enable you to develop architectural effects.

You can combine the Transite sheets with insulating materials for curtain walls. You can also use them to create beautiful and practical interior wall facings or partitions.

When need for alteration arises, the sheets are almost 100% salvageable. If you plan to build—*and particularly if you have a problem of industrial expansion for military defense*—investigate the possibilities of Corrugated Transite. Write Johns-Manville, Box 158, Dept. FM, New York 16, N. Y.



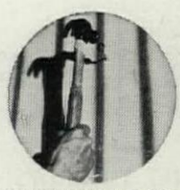
EASY TO FASTEN TO STEEL



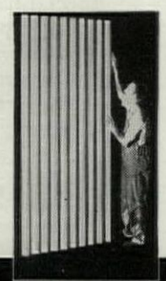
EASY TO SAW



EASY TO DRILL



EASY TO NAIL TO WOOD



Johns-Manville *Asbestos* **CORRUGATED TRANSITE**



New Vinyl-Plastic Asbestos Floor Tile

developed by Johns-Manville

Now you can have a more beautiful lifetime floor! Ideal for kitchens and cafeterias. Greaseproof, unharmed by strong soaps, easily kept spick-and-span.





● Terraflex, a development of Johns-Manville research, is entirely new and different. Its bright colors and rugged characteristics are obtained by blending beautiful, clear, vinyl resins with *indestructible asbestos.*

Unlike other resilient floorings, J-M Terraflex is unharmed by strong soaps and caustic cleaning solutions —cannot "wash out." Requires no scrubbing, is not harmed by spilled oils and greases, moisture or dampness. Does not crack, curl, become loose or brittle, or shrink around edges. Does not become fuzzy or scratched, or lose its sheen from constant wear. Beautiful pastel colors keep their *first-day newness* for a lifetime.

The square tile-like units come in a wide range of marbleized colors. See the J-M Approved Flooring Contractor in your area. He is listed in the classified phone book. Or write for our free brochure on Flooring. Johns-Manville, Box 158, New York 16, N. Y.

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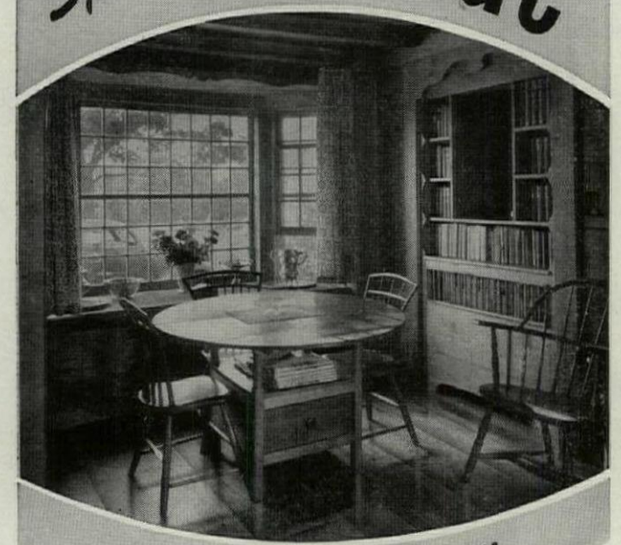
Other J-M products include Acoustical Ceilings—Movable Walls—Corrugated Transite®—Built-Up Roofs—Etc.

Specify shellac



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Gives a satin-smooth natural finish to

FLOORS, PANELING, ALL WOODWORK

- *Won't Scratch or Mar*
- *Will Not Darken with Age*
- *Outwears Other Finishes*

UNEQUALED WHERE A NATURAL WOOD FINISH IS DESIRED

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Shellac is Easy to Apply — Easy to Maintain
dries fast, simple to retouch and keep beautiful

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of the Shellac Manufacturers Assn., Inc.
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Please send, without obligation, "Standard Specifications on the Use and Application of Shellac."

Firm Name_____

Address_____

City and Zone_____ State_____

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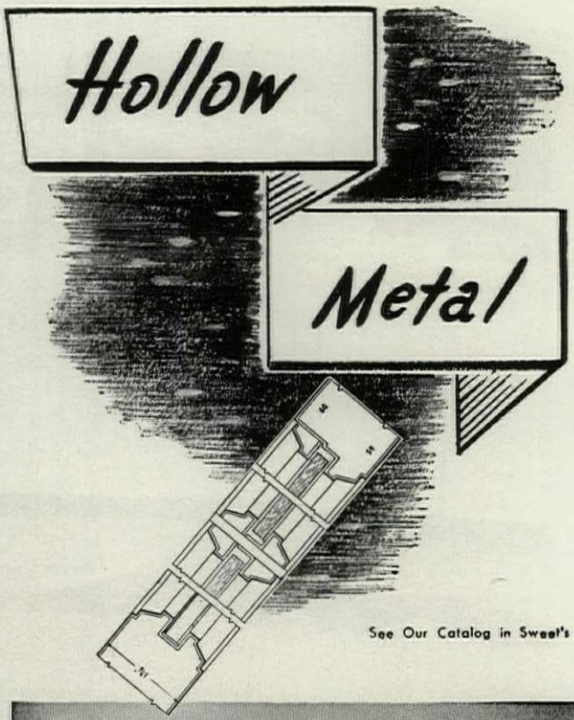
Hollow Metal



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JAMESTOWN METAL CORPORATION
104 BLACKSTONE AVENUE JAMESTOWN, N.Y.

DODGE Vinyl-Cork TILE



LOW UPKEEP

For detailed information and test data write for catalog.

The 100 per cent clear vinyl surface is non-porous—does not collect dirt or grit. A Dodge floor never requires waxing or polishing. The only beauty care it needs is ordinary soap and water.

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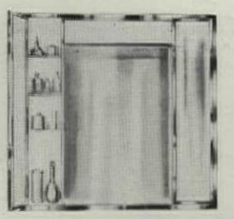

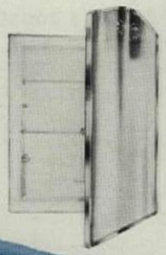

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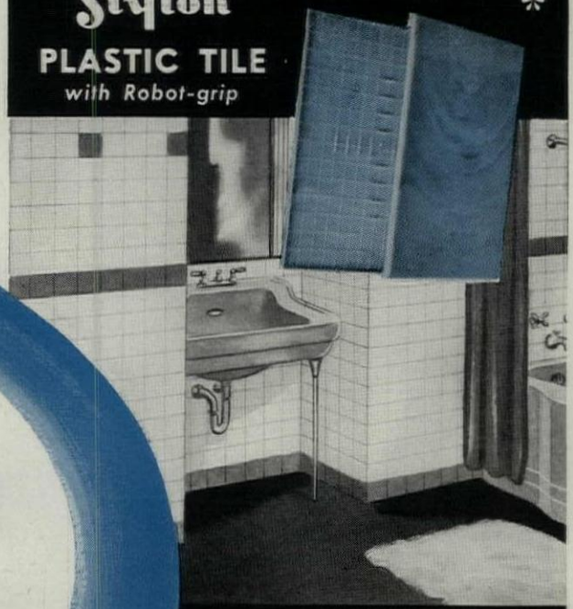

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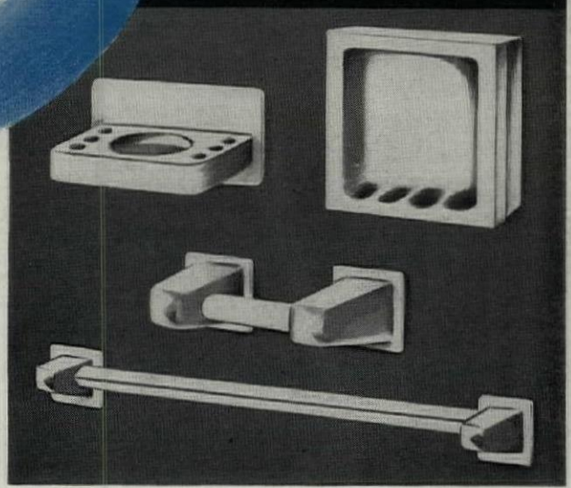

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CODES VS. PROGRESS—building officials, preoccupied with their defense of today's codes, are reluctant to look ahead to tomorrow's possibilities

In its March issue Building Standards Monthly, *a magazine for building officials, criticized the article* Codes vs. Progress *by Robert L. Davison in the December 1950 issue of* THE MAGAZINE OF BUILDING.

Reproduced below is the Building Standards Monthly *article—annotated in rebuttal by Robert L. Davison and followed by a more detailed discussion of some of the arguments raised by that magazine.*

The Building Standards Monthly *article apparently was inspired by an urge to defend the Uniform Code and the Basic Code from* THE MAGAZINE OF BUILDING'S *critical observations about obsolete and outmoded codes. Those observations were not aimed at those two codes, but at many of the 2,200 codes, particularly the older ones.*

Facts bear out the contention of the original article that some regulations in the older building codes, when applied to modern methods and materials, have acquired a restrictive meaning which was not contemplated at the time these codes were written. Building Standards Monthly *assumes that* THE MAGAZINE OF BUILDING *article intended to prove that contention. It did not. Its objective was to present "a codeless look at tomorrow." It suggested that high-heat-resistant steels now being developed (but not yet economically feasible for use in building construction) may "tomorrow" afford reasonable safety without the application of fire-protection currently required by codes. The article in* Building Standards Monthly *analyzes tomorrow's potentialities in the light of today's materials.*

MARCH 1951
Vol. XX No. 3
BUILDING STANDARDS Monthly

Codes *Against* Progress?

THE accompanying article, "Codes Against Progress?" was written by the authors in answer to an article, "Codes vs. Progress," by Robert L. Davison, appearing in the December issue of "Architectural Forum, the Magazine of Building," which points out the obsolescence of all United States building codes and gives a strong recommendation for the use of various types of non-combustible constructions and assemblies, many of which no self-respecting building code would permit, neither would the industry fabricating these various types of construction recommend them for use as suggested by the author for multi-storied buildings.

The article by Mr. Cravens and Chief Boone is presented in answer to the sweeping charges of building code obsolescence by Mr. Davison and is not intended to discredit the industry which unfortunately was involved in Mr. Davison's obvious and apparently superficial search for material to support his thesis. It should be pointed out that the industry in question does not recommend the use of non-combustible constructions or assemblies that do not afford the necessary fire-resistive ratings for use in fire-resistive types of buildings—Editor.

Part I

THE BUILDING OFFICIALS' POINT OF VIEW

By ROLLAND P. CRAVENS
Code Consultant
Pacific Coast Building Officials Conference

IN the "Architectural Forum," December, 1950, there appears another article* using the old theme that building codes are obstructing modern architectural design. The author bases most of his arguments on the theory that steel floor systems and high strength steel alloy spandrel beams do not need the fire protection specified in all building codes for fire-resistive buildings. He states that fire tests are unrealistic when compared with temperatures which actually occur in fire.

This statement is made without supporting evidence other than a chart showing temperatures of an actual burn-out where the combustible contents in a room were 7.3 pounds per square foot. This tells us nothing new because many similar tests previously made indicate that the standard fire test temperature curve is equivalent to the temperatures resulting from a fire in a room with combustible contents equal to about 20 pounds per square foot. It is well known that the contents of most buildings are considerably less than the loads for which the building was designed. This applies both to floor loads on the structural members and to fire hazard loads from combustible contents.

It would be as reasonable to design the floors for a live load of 7.3 pounds per square foot as to design the fire resistance on the same basis. Where fire tests are actually unrealistic is in the test panel construction. Fire tests are made on relatively small panels whereas the building is constructed with panels large in area and broken by openings and inserts.

The author calls building codes antique because they do not permit steel floor units without fire protection below. It is asserted that these panels will not cause a serious failure in case of fire, although they might sag in a catenary if exposed to severe fire conditions. A fire condition far less than severe would be sufficient to raise the temperature of such a floor system to the point of failure. In a large room, covering many bays, exposed steel panel sections would be a hazard to the entire structure of the building. The sagging

*"Codes vs. Progress," by Robert L. Davison, Research Director, Howard T. Fisher and Associates.

Bureau of Standards, Technical News Bulletin, July, 1926.

This was the maximum movable property in any one bedroom and bedroom closet. The average combustible content per apartment was 3.4 lbs. per sq. ft. (Source: p. 21, BMS 92, Bureau of Standards.)

This is equivalent to a layer 10" deep of loosely stacked kindling and cord wood. (If there were no voids the wood would qualify as mill construction which many codes rate as more fire resistant than unprotected steel.)

Concentrated furniture *storage* is equivalent to no more than 15 lbs. per sq. ft. (p. 5, BMS 92.)

We agree window openings should be included in the test panel to obtain a *realistic* appraisal of the safety factor of any type of exterior wall which is to have windows. *No* wall would then meet present-day code fire tests.

How much? 5-7.3 lbs.? What supporting evidence is there that such floors would cause the building to fail under a real fire or realistic fire test?

(Continued on page 242)

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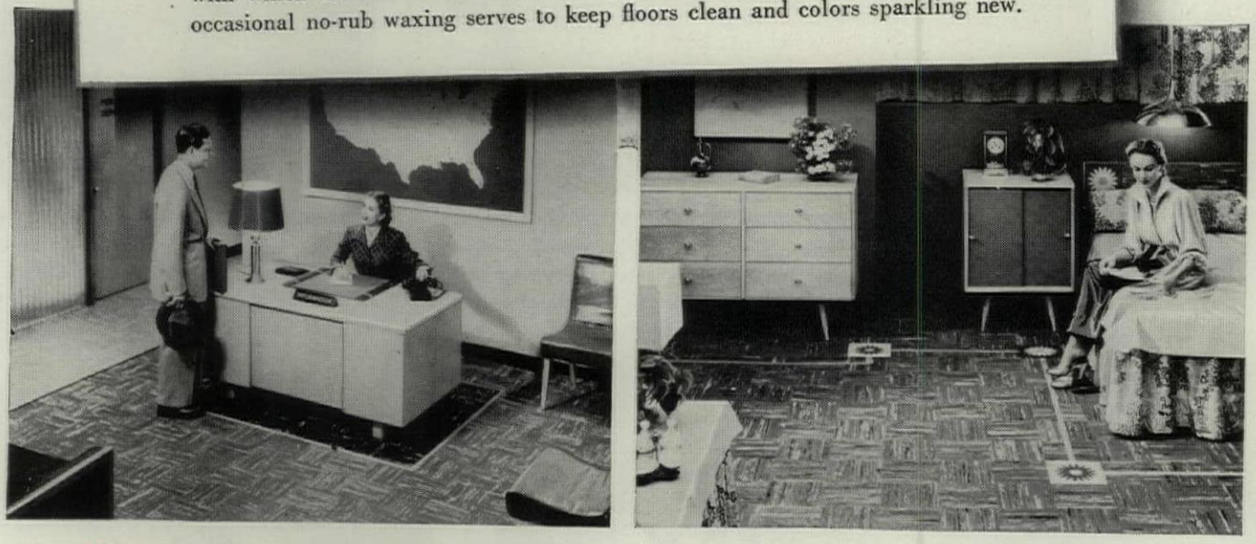

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Here's Mrs. Duffy telling her neighbor, Mrs. Coment, that their builder, Mr. Oman, had telephoned and asked whether he could call to discuss her reactions to the all-electric kitchen . . . said he believed such information from people in the development would be invaluable in planning his future homes.



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"It's amazing to me, Mr. Oman, to see all the food that can be stored in the G-E Refrigerator, and it's so *easy* to keep everything in place. Furthermore, it's a thoroughly *dependable* refrigerator."



"Thanks, Mr. Oman, for selling me a house which included all these fine appliances at a time when they could be put into my mortgage at such low additional cost. All my friends wish *they* had a G-E Kitchen for only $3.50 a month!"



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CODES vs. PROGRESS

floor systems would tend to pull the supporting beams laterally and buckle the columns. If the attachment welds joining the decking to the beam were strong enough to resist the tension which might be as much as 10,000 or 15,000 pounds per foot, the compression flange of the beam would collapse, taking away all support from the columns.

We do not believe that any competent architect would design a building for his client wherein the floor systems would sag and droop in a fire no greater than that resulting from a full waste basket, a pile of unpaid bills, and yesterday's racing forms.

Firemen who have the job of entering these buildings and extinguishing the fires do not approve of unprotected metal for structural purposes in multi-story buildings. The fact that no building code approves a construction of this type more probably denotes its undesirability than the obsolescence of the codes. The use of an unprotected incombustible material such as steel is not prohibited by the codes for use in any building where the height and area justify an unprotected structure.

The author has mentioned an isolated example of a building code placing an arbitrary limit on the spacing of concrete joists. That building code is the one in effect in Worcester, Massachusetts. Having ferreted out a single arbitrary requirement found in one particular code, the author concluded that codes in general obstruct designers of new material and construction. Sandwich panel walls are illustrated with the statement that these are excluded by our antique codes and that this product of U. S. ingenuity has been banished to Fairbanks, Alaska, where the code is not obsolete. This may be true of codes in backward communities but it is not true about codes in effect in the numerous cities using the Uniform Building Code. The Basic Building Code, which more recently entered the field, also permits this type of construction. These codes will accept any system of construction that is shown to be equivalent in safety to standard systems in general use.

Some of the panels illustrated have already been approved by the Pacific Coast Building Officials Conference under its research program for use in cities adopting the Uniform Building Code.

In an accompanying report Doctor Michael Watter suggests a light gauge spandrel beam of stainless steel to consolidate the functions of structure and skin into what is termed a "startlingly light panel" typically four feet high and 22 feet long for office buildings and weighing only 380 pounds. He further states that it would require no fire protection, citing as evidence the tensile strength of 13-3 stainless steel high temperatures. The load upon the spandrel is taken at 700 pounds per foot.

Building designers will hardly be startled at the use of light gauge steel for structural members, for codes permit that, but they certainly should be startled to learn that no fire protection is needed. The stability of a structural flexural member depends on its resistance to lateral buckling of the compression flange and is not closely related to the tensile strength. A formed steel beam 22 feet long, four feet deep, and fixed at the ends would develop a warped personality with uncertain tendencies when exposed to high temperatures. The chart showing the relationship between tensile strength and temperature does not predict the actual performance of the beam when exposed to fire.

Building codes are popularly blamed for blighting all our bright new design concepts when the real trouble often lies in the owner's budget. Designers are led to choose a low-cost light-weight truss of standard structural shapes because this type of spandrel weighs little more than the stainless steel spandrel suggested, costs much less, and is easily fabricated. Modern codes such as the Uniform Building Code do not require heavy masonry fire protection around these structural members. Plaster or light-weight aggregate concrete may be used.

It is about time the critics of the codes recalled a fundamental of government. Building regulations are a legislative problem subject to local legislative choice. City councils are free to choose a building code consistent with their ideas of local needs. If they wish, they are free to provide protection ranging from no code at all to one that is highly restrictive and which would provide complete fire protection. Most cities select a reasonable building code which will provide a reasonable degree of fire protection. They usually are wise enough to rely on the judgment of the many rather than the opinion of the occasional dissenter. It would not be necessary to debate these little absurdities if this basic legislative function were kept in mind. The people acting through their legislative bodies are entitled to a reasonable code providing reasonable protection.

The author makes one statement with which we are in complete agreement. That statement is: "There are no obsolete building codes in Fairbanks, Alaska." The city of Fairbanks, Alaska, has adopted the 1946 edition of the Uniform Building Code.

No competent architect would want to design for a client with that amount of "unpaid bills." The modern building is not used for storing cord wood.

The height "for residential buildings of other than the fireproof type has been variously placed at 3 to 6 or 7 stories." "The increased safety with incombustible floor and other subdividing interior construction has been abundantly indicated by the fire record." (P. 20, BMS 92)

. . . if tested with 25% window openings.

Good!

If an old-type unprotected and uninsulated sheet-steel building survived two burn outs and subsequently was used for storage purposes by the Bureau of Standards for many years, it seems reasonable to hope that stainless steel might withstand a burn out test of 7.3 lbs. per sq. ft. *Realistic* tests should be run on this member.

In any real fire, it is the window head—the tension member—which is exposed to the maximum temperature.

In reporting the talk by Architect George Caleb Wright before the Annual Convention of Building Officials Conference of America, *Building Standards Monthly* for August 1950 said: The architect "meets the building inspector with a code book in his hand. Again I beg you, have a bit of understanding sympathy. As a case in point, I might cite the curtain wall. . . . The many approaches to this problem which appeared in THE MAGAZINE OF BUILDING for March indicates a vast amount of thought being given to curtain walls. Under present conditions, in some cities, many of these interesting solutions to the curtain wall problem will stop in the building commissioner's office. I know that, most generally, the deterence in solving problems of this type is the code and not the official."

Or tests may limit the design of steel structures to 16,000, 18,000, 24,000 or 200,000 per sq. in. tensile strength. It is to be hoped that this choice will, to an ever-increasing degree, develop code provisions by reference to scientific standards which can only be based on tests, not opinions.

Good!

(Continued on page 246)

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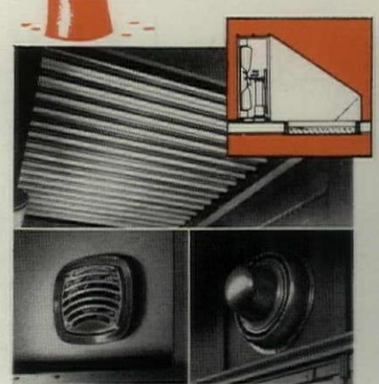

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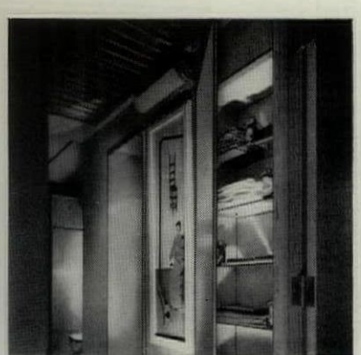

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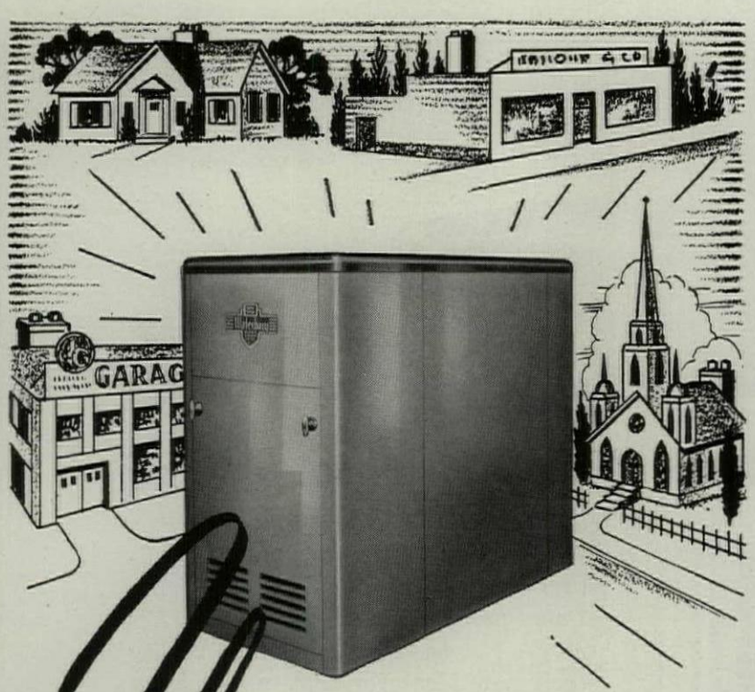

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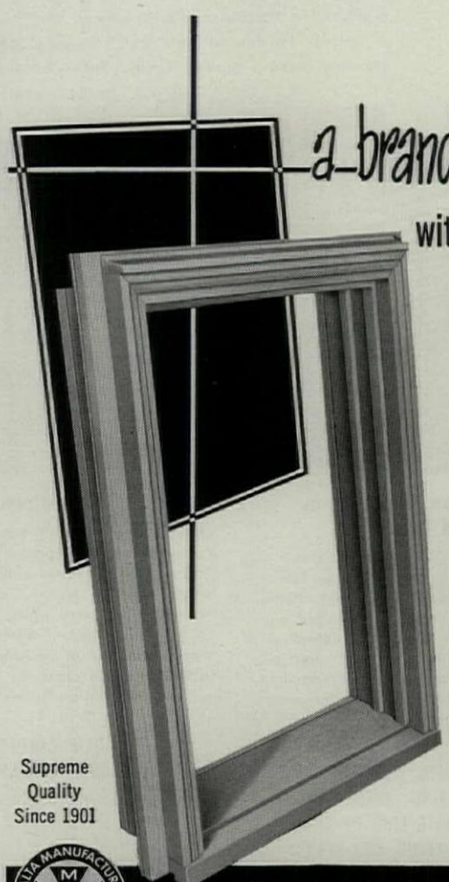

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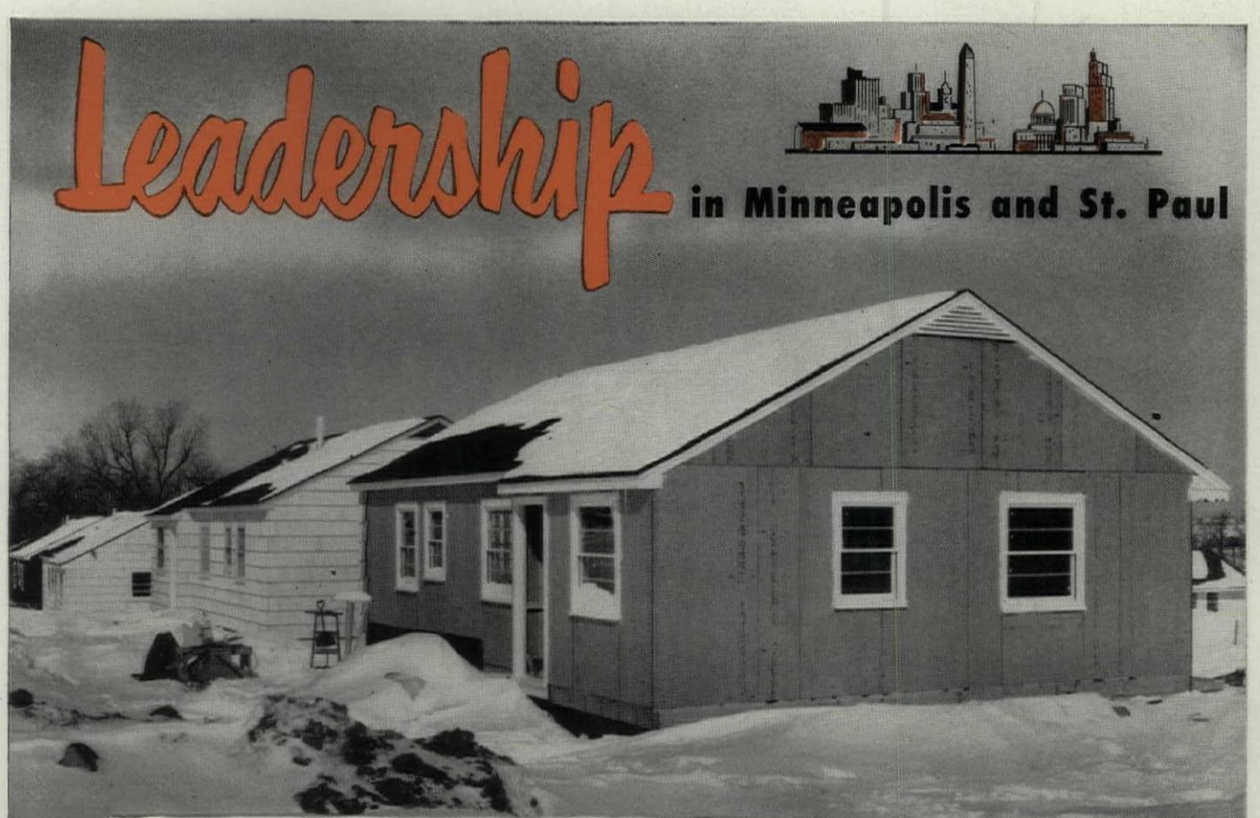

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Refer to Sweet's File, Architectural Section—10a/In

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CODES vs. PROGRESS

Although use of unprotected steel has a very real fire-safety value through its fire-prevention qualifications, it is not the intent of THE MAGAZINE OF BUILDING to substitute today's unprotected steel for fire-protected steel in buildings of such height or use that fireproof or fire-resistive construction is needed.

Fire protection authorities agree that some of the fire resistance requirements of building codes are more severe than necessary. The *Building Standards Monthly* article takes exception to some of THE MAGAZINE OF BUILDING'S statements to that effect and merits a more detailed rebuttal:

"Without supporting evidence etc."

Report BMS 92 of the National Bureau of Standards gives the average or representative combustible content of various occupancies as determined from actual surveys. The average or representative combustible content per sq. ft. of floor area for the several uses, as developed from those surveys, is less than 10 lbs. for residential, school, institutional and assembly occupancies, and less than 15 lbs. for office occupancies.

"Combustible contents equal to 20 lbs."

The temperatures of the ASTM standard fire test curve increase as the time of fire test exposure increases. An occupancy with combustible content equal to 20 psf represents a fire exposure of 2-hr. severity as measured by the standard test curve, according to the correlation established by the National Bureau of Standards. That degree of hazard exceeds the representative hazard that prevails in all the occupancies cited above. Consequently noncombustible construction having less than 2-hr. fire resistance would afford adequate fire protection against the hazard prevailing in those occupancies. In many light occupancies there is little likelihood of a bad fire if the structure itself does not contribute fuel.

"Live load of 7.3 per sq. ft."

The purposes of structural regulations and of fire protection regulations are vastly different. The former must provide safety under normal service conditions; the latter must provide safety under an emergency fire condition which may never occur. Structural members are always at work carrying a load. On the other hand, while fires occur somewhere in the U. S. at the rate of about one a minute, the chances of there being a severe fire in the average building—a fire which would test the full fire resistance of the structural members—is about one in one thousand years.

Therefore, good reason exists for designing floors to resist lighter fire loads than structural live loads.

"Fire tests are actually unrealistic"

According to Report BMS 92 of National Bureau of Standards (p. 19), "fire-resistance ratings are based on the performance of members near the lower range in size. For the larger size of members used in all but the upper stories of such high buildings, there would be considerable increase in fire resistance above the nominal ratings for the same kind and thickness of protecting materials. Also, the structural continuity inherent in the type of construction increases the margin of safety on stability above that indicated in test furnaces for comparable fire exposure and loading of segregated columns, beams, and floor and wall assemblies."

There is little justification for discrediting the ASTM standard fire test.

(Continued on page 250)

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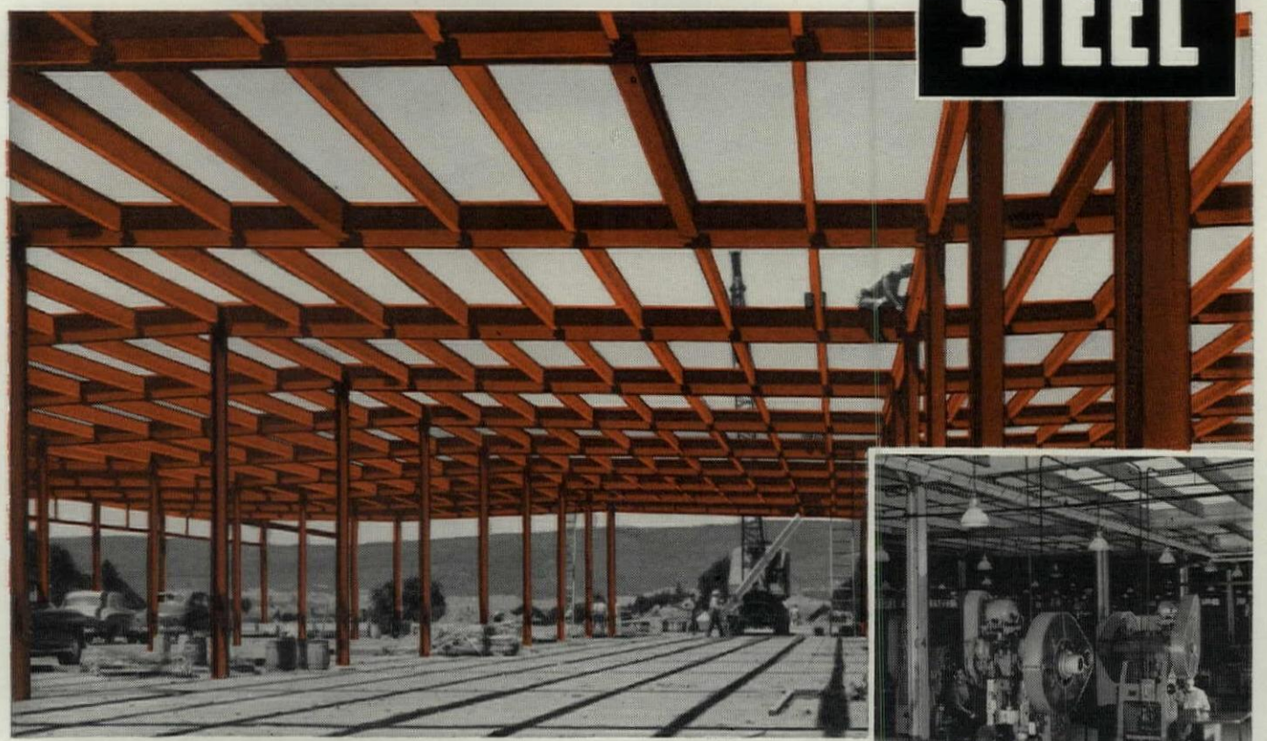

A typical example of steel framework in one of the LIFE plant buildings. Junior Beams contribute vitally to the ease and speed of construction.

Interior view of completed plant occupied by the Eastern Mfg. Div., The Trane Co., showing Junior Beam roof purlins in the economical ceiling construction.

JUNIOR BEAM ROOF PURLINS SAVE TIME AND MONEY IN CITY'S PLANT CONSTRUCTION PROGRAM

The citizens in the area of Scranton, Pa., have embarked on a farsighted program of industrial plant construction. They call it Lackawanna (County) Industrial Fund Enterprise—LIFE. Its aim is to attract new industries which will provide the district's unemployed with sorely-needed jobs.

Early in the program, the Anthracite Bridge Company, Scranton, worked out an economical building system which has been used in almost every new plant erected.

J&L Junior Beams play an important role in making this low-cost, speedy construction possible.

For example, in Building No. 1 of LIFE's program light-weight Junior Beams were installed as roof purlins. A five-man crew with a light truck-crane plus another five-man "bolting-up" crew erected the entire steel framework of the 180' x 460' building *in less than 10 days!*

The uniformity of Junior Beams made them readily adaptable to variations in design, and their ease of handling further speeded construction—two factors that *saved time and money on the job.*

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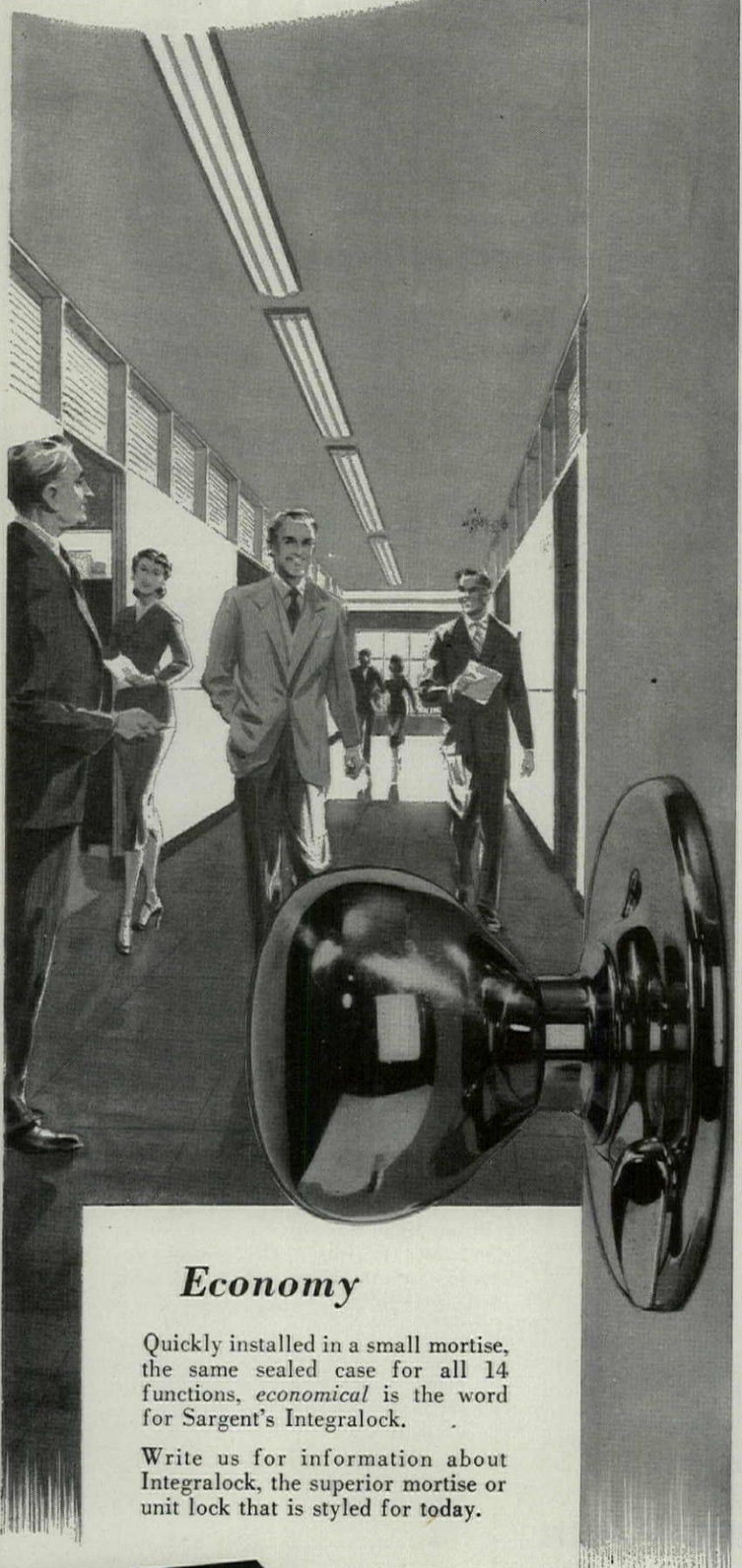

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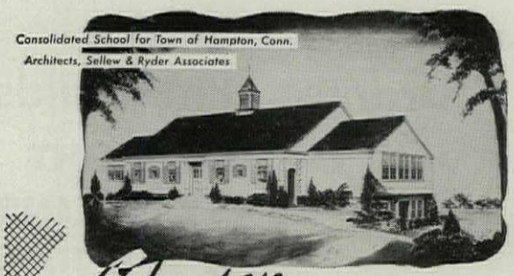

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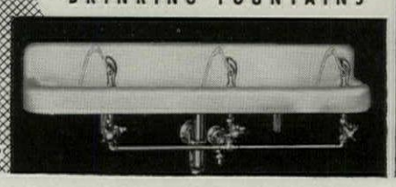



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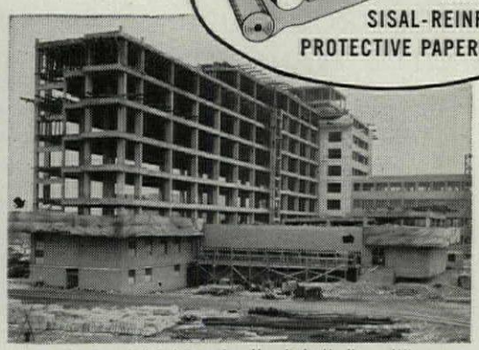
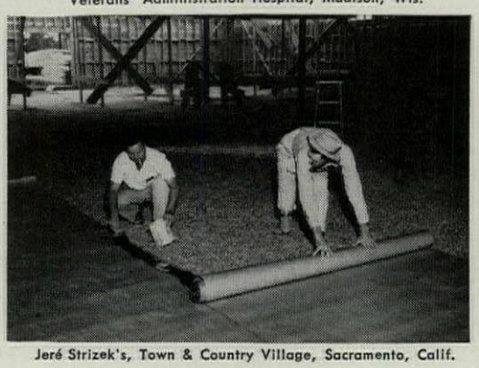


Veterans' Administration Hospital, Madison, Wis.



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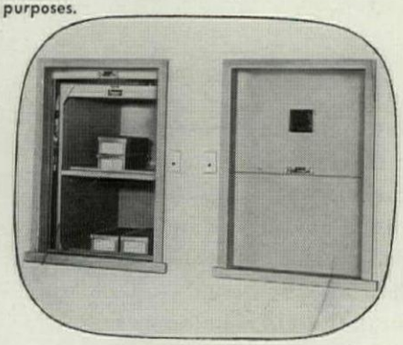

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CODES vs. PROGRESS

"Floor systems would sag and droop"

Actual burn-out tests conducted by the National Bureau of Standards (residential and garage occupancy) show that today's unprotected steel is capable of withstanding successfully fire exposures in occupancies where the combustible content is relatively moderate. But "time is everything in a fire"; the most valuable fire-safety attribute of today's noncombustible or unprotected steel structure is its fire-prevention value. It deprives fire of fuel in the critical incipient stage, thus preventing spread of fire, giving better opportunity for control of the fire, and giving better opportunity for the safe egress of occupants—important safety factors.

Today's steel actually has greater strength at temperatures of 600°-700° F. than at 70° F. and will safely carry full design load (which it seldom is required to do during a fire) at temperatures of about 1,200° F. Today's unprotected steel is not a substitute for fire protected construction, but it does have real fire-safety value in preventing small fires from becoming big. It eliminates about 15 lbs. of fuel per sq. ft. of floor area that would be added were the interior construction of wood—reducing the total potential severity of fire hazard by about 1½ hrs.—an important fire-fighting consideration.

The National Board of Fire Underwriters Code recognizes these safety factors; it allows one-story structures of unprotected noncombustible construction for uses where large or "unlimited" areas are required.

"Firemen . . . do not approve"

The ASTM fire test (ASTM-E119) bases fire ratings of steel girders and steel columns on their well-established ability to support full design load at temperatures of 1,000° F. average and 1,200° F. maximum temperature during fire exposure—temperatures far higher than those that would cause death of the occupants of buildings or firemen exposed to them.

"In one particular code"

Most of the building codes of the U. S. (the older ones) still require 4-hr. masonry exterior walls, a requirement which now prohibits the use of curtain wall assemblies, irrespective of their fire-resistance qualifications.

"A warped personality"

Why require a high degree of fire resistance for the nonload-bearing spandrel wall located directly below a glass window through which fire can enter a building immediately?

"Fairbanks . . . adopted the 1946 edition"

It is unfortunate the 1949 edition of the Uniform Code was not adopted.



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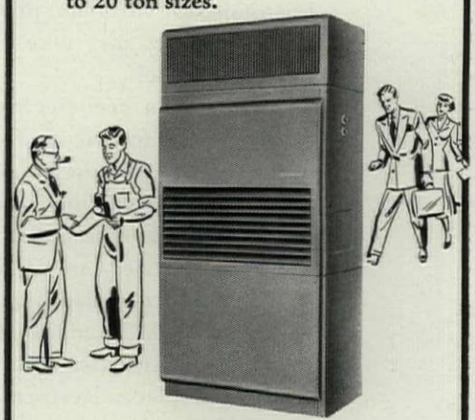

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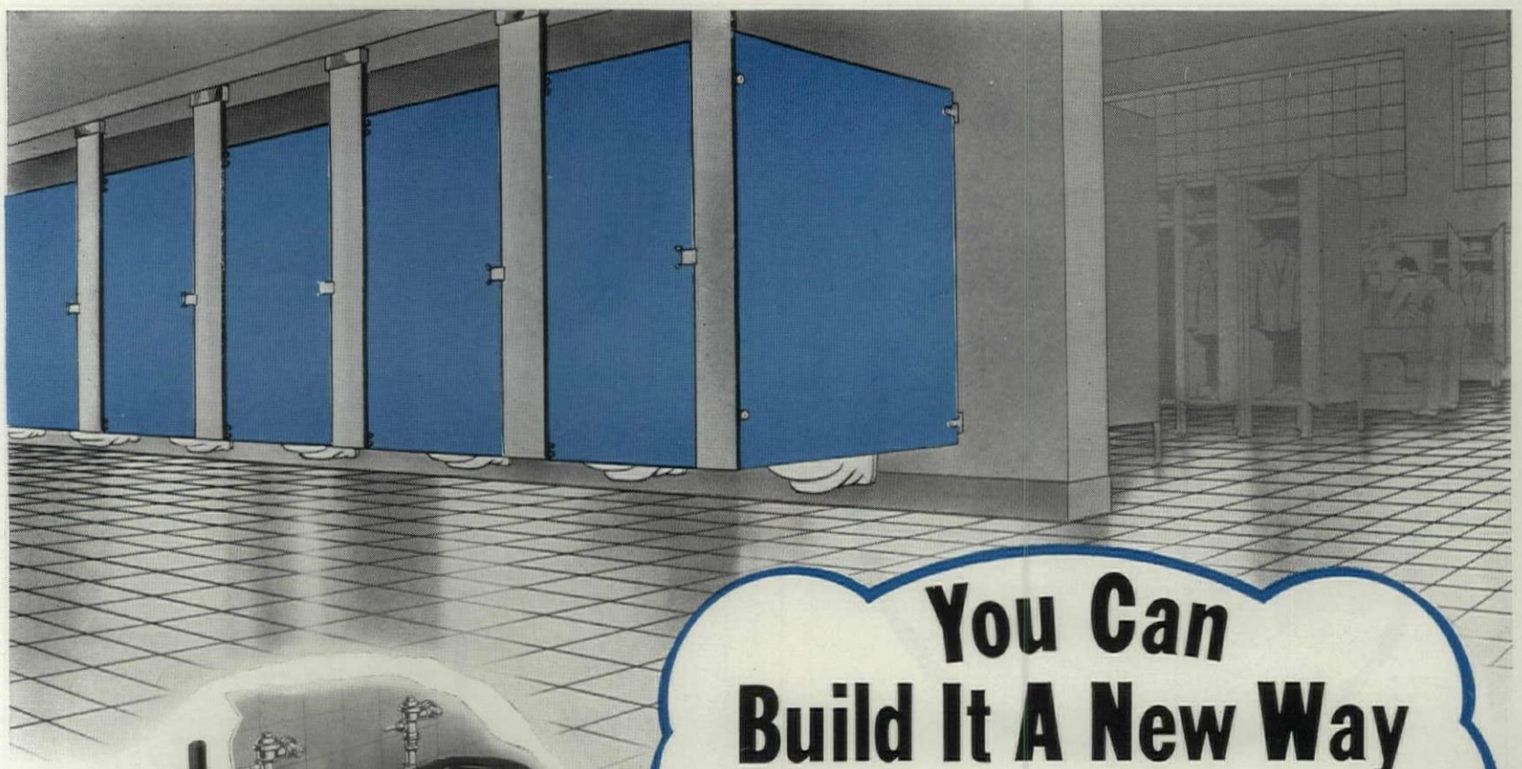

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And Get Roominess That Is Otherwise Unobtainable



Fixture-Bare Floors Reduce The Cost Of Cleanliness

Immaculate cleanliness is no problem in toilet rooms with fixture-bare floors—where plumbing fixtures are off the floor, because there is nothing to interrupt the sweep of the broom and the swish of the mop. Fixture-bare floors reduce the day-by-day dollar cost of maintenance of cleanliness to an all-time low while lifting sanitation to a new high. Specify wall type plumbing fixtures—they give toilet rooms a roominess that is otherwise unobtainable.

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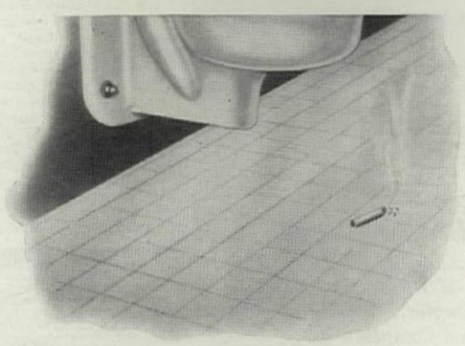

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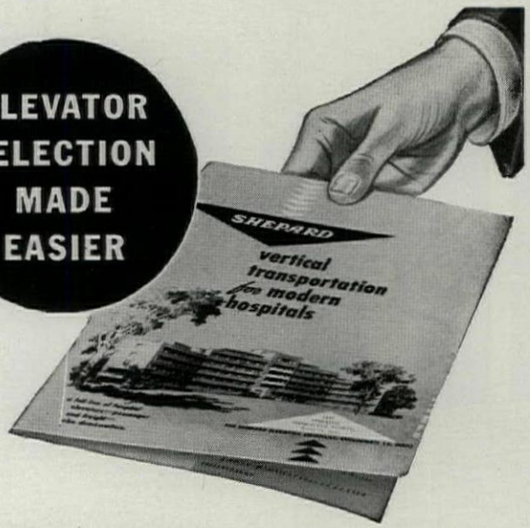

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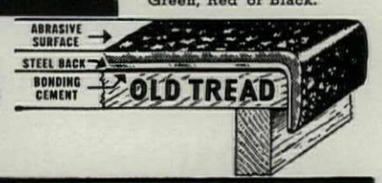

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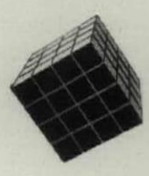
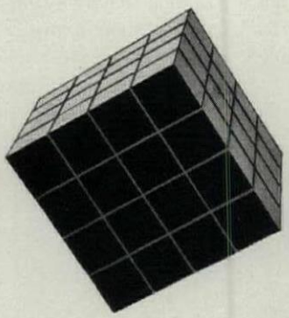
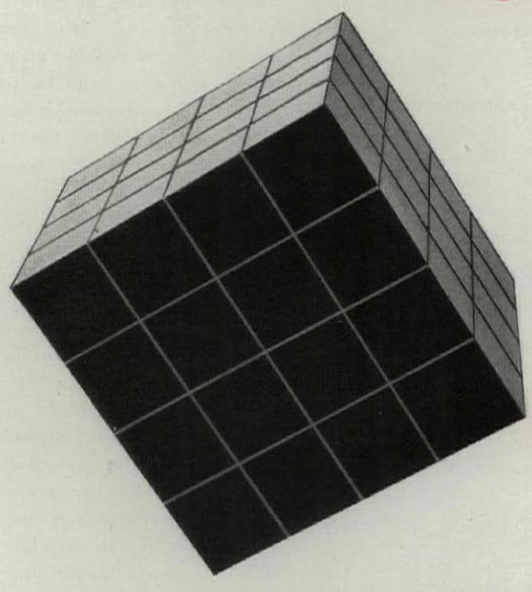
that grew



and grew





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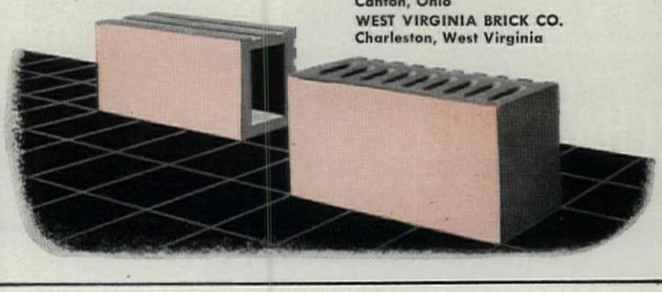

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WASTE VS. HEALTH

(Continued from page 113)

Proposed plumbing code sane but conservative

"The *Plumbing Code* recently prepared under the joint sponsorship of the American Public Health Association and the American Society of Mechanical Engineers represents a marked advance in reasonableness and sanity. It should be considered the absolute maximum of justifiable requirements at the present day.

"In the future even this code should be made much less exacting. It contains a section on 'Vents and Venting' which requires that the seal of every fixture trap in a plumbing system shall be protected by an individual vent (or back vent). This is to avoid the possibility that the rapid discharge from a fixture may siphon the trap of that fixture and permit temporary connection with the air inside the plumbing system. Under the 'sewer gas' theory this would be a deadly hazard, but in the light of modern hygienic knowledge the danger of disease transmission is illusory. . . . Those who continue to subscribe to the discredited 'sewer gas' theory would do well to review the studies made many years ago showing that, as regards the hazard of bacterial infection, a person who placed his mouth at the top of a plumbing stack and breathed the air from it for 24 hours would inhale no more colon bacilli than . . . found in a quart of New York City drinking water.

House traps but not garbage pails

"It is reasonable to insist on a main trap in the house drain. . . . It is equally reasonable, as some cities do, to prohibit all traps on main house drains. . . . It is quite impossible, however, to justify on any valid health basis the very considerable cost involved in individual venting of each fixture trap to avoid the possibility of an occasional temporary break of a fixture trap seal. If such a break occurs, its only effect might be a musty odor, immediately correctable by refilling the trap.

"A great need exists for comprehensive research not only on plumbing design but also on the usefulness and practicability of new materials that give promise of cutting installation costs. Plumbing codes should be made as flexible as possible to encourage progress in the use of new materials and methods. Reduction of the size of soil pipes should be given careful consideration. . . . A real opportunity exists to make very substantial reductions in plumbing installation costs without sacrificing health protection."

Although garbage grinding should not increase the sewage load by more than 10%, automatic disposers attached to sinks are still outlawed in many communities. The report considers this type of disposal of organic wastes ideal from the standpoint of disease control, and states that "the day may come when the garbage pail will be as outmoded as the outdoor privy."

Defects in present laws

The report maintains that the manifold problems brought about by codes can be solved not by tossing regulations aside altogether but by substituting *performance* codes for the *specification* codes. "It can safely be said that most of our existing building codes are out of date, lacking any provision for many essentials of healthful housing, and in other respects unreasonably restrictive, thus increasing the cost of home construction.

"There has been an increasing demand for a form of regulation which will state the standard or objective of health or safety to be achieved, leaving it to the ingenuity of science, invention, the designer, and the production industry to devise acceptable ways of achieving these objectives. The Committee heartily supports this movement, and the suggestions and recommendations throughout this volume can find effective expression only under this more flexible type of regulation, commonly called a "performance" code.

(Continued on page 256)



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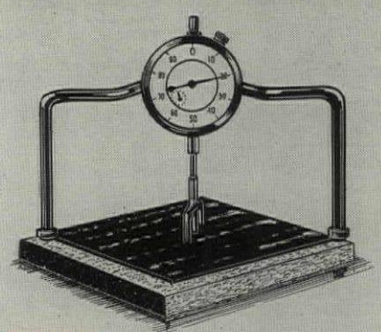

CURLING

After being in contact with moisture for 120 hours, MATICO Tile, above, must conform to rigid specifications for curling. Here the degree of curling is being measured after exposure.

To guard your priceless asset—the confidence and good will of your clients—MATICO maintains a constant control over quality. Every few minutes, production samples of MATICO are sent to the MATICO laboratory where they are subjected to the exhaustive tests shown here. Any sample that fails to "measure up" is immediately rejected, along with the entire lot from which it came. If necessary, production is halted completely until the cause can be corrected.

The result of this careful control of MATICO quality is an economical, durable, colorful asphalt tile flooring you can specify, with full confidence that it will deliver outstanding performance. And you can count on MATICO for every type of installation—schools, stores, restaurants, hospitals, industrial plants, theatres, government buildings, and for every-room flooring of private homes.

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GET TO KNOW MATICO

See our insert in Sweet's File Architectural, section 13 g/Mas.
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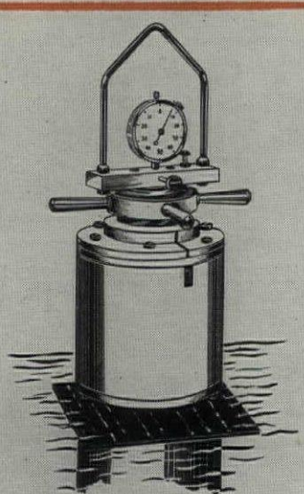
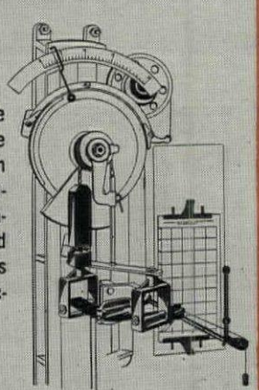
INDENTATION

Testing MATICO production samples with the McBurney indentation tester. Tiles are first brought to a temperature of 77° F. by keeping them in water for ¼ to ½ hour.



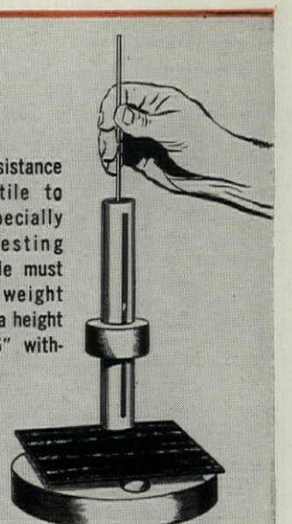
FLEXURE

MATICO tiles from the production line are tested for flexure in the MATICO laboratory. Tile must withstand a specified load and not show less than specified deflection.



IMPACT

Determining resistance of MATICO tile to impact on specially designed testing equipment. Tile must withstand a weight dropped from a height of 4½" to 6" without cracking.



DEPT. 65

MASTIC TILE CORPORATION OF AMERICA

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1-R38

Framing by load, not whim

"Many codes stipulate minimum sizes for wood framing members regardless of the loads imposed upon them. They require minimum wood floor joists of 2 x 8″ dimensions; some even require 2 x 10″, when for certain spans in floor construction 2 x 6″ or even 2 x 4″ [*sic!*] joists can be used with safety. Similarly, many codes establish maximum spacing for joists, rafters, and studs regardless of the loads imposed or the structural members used. Requirements of this sort have tended to limit the development of new materials which would permit wider spacing with safety. Few codes recognize the difference between load-bearing and non-load-bearing partitions, and require all to be of load-bearing construction or design. Since load-bearing partitions comprise less than 50% of the partitions used in residential construction, the lack of distinction handicaps development. The recent development of storage walls and prefabricated closets indicates possibilities in this field.

"Live-load requirements in many codes are excessive. Most codes stipulate floors capable of supporting live loads of 40 lbs. per sq. ft. for residential construction; some require 60 lbs. or more. Many codes require that floors of public corridors or stairs support a minimum of 100 lbs. per sq. ft. This requirement was formulated basically for commercial buildings and is scarcely necessary for garden-type apartments where the contemplated concentration of persons in the hall or on the stair would never require a loading comparable to that of a theater or office building. These requirements, when excessive, are reflected in the over-design of all the structural members of the building.

"Many codes stipulate minimum ceiling heights in excess of the requirements for healthful living. Standards which stipulate ceilings higher than 7 ft. 10 in. cannot be justified on this basis and serve to increase building costs.

"The device of the 'factor of safety' is familiar in building codes—the unwillingness to grant full strength to materials. . . . Nationally recognized standards for the strength of many materials exist and should be recognized in all codes. . .

"The code regulation that a residence must have a basement excludes the economy of adequately designed basementless houses, now demonstrated to afford safe and comfortable living conditions in many parts of the U. S. Neither need foundation walls be exclusively of concrete. Unit masonry construction, pier and curtain wall construction, or floating slab construction are all suitable alternatives which should be acceptable. . . .

"Requirements that chimneys must be of masonry construction have delayed and discouraged the manufacture of improved chimneys with decreased fire hazard and improved draught characteristics. Whereas wood must be kept 2 in. away from masonry chimneys, several prefabricated chimneys are now being marketed, with the Underwriters' Laboratory label, which may be placed adjacent to combustible construction, may be supported on wood framing, and provide better draught conditions, particularly for intermittent firing, which is characteristic of most automatically-fired heating equipment.

Standardization for simplicity, economy

"Even if present codes were reasonable and adequate, they are open to criticism for the lack of uniformity in their requirements in different areas. This is a very serious factor in the present period of high cost of construction. It retards the simplification of inventories of the manufacturer and the distributor. It deters standardization in methods of construction. It causes unduly costly construction in some areas, because standards are higher than necessary, and permits low standards in other areas, to the detriment of the occupants and the community. . . .

"Present codes are, therefore, based on traditional methods of construction and place unnecessary obstacles in the way of new development. . . . On the other hand, the requirements of many

(Continued on page 260)

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The architect, builder, and owner — everybody profits with AMWELD. Architects recognize these well-known products blend with all types of architecture and provide lasting beauty. Builders know because they meet today's modern and exacting construction standards, insure perfect fit, and require much less installation time. Owners profit because of their beauty, low cost, and a lifetime of trouble-free service.

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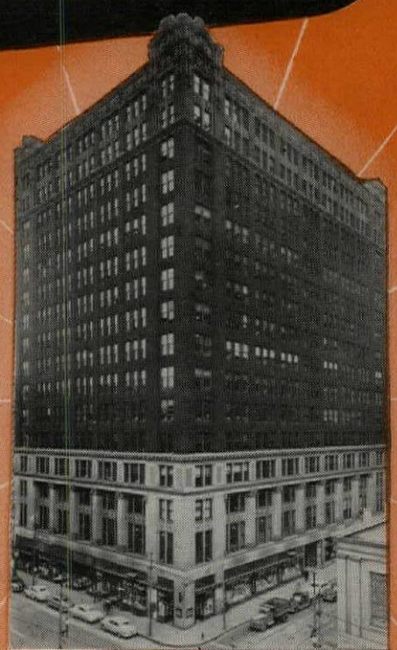
Pittsburgh's Chamber of Commerce Building is a typical example of a commercial building that felt the pinch of an out-dated and inadequate electrical distribution system. Constantly increasing tenant demands for power made electrical modernization imperative if the building's economic life was to be maintained. The owners, through C. C. McKallip and Co., Agents, looked for an electrical system that could be easily and economically installed, yet meet all the future power requirements of the building tenants. They discovered National Electric "Lo-Loss" Feeder Bus met all these requirements—and more.



Electrical Engineer, James Paul Warner

"Lo-Loss" Busway was chosen for this application because of its *proved flexibility* as a riser bus in commercial buildings . . . its light weight . . . its ease of installation. Factory fabricated sections required minimum space and saved installation time—both of prime importance to any modernization job. Now, branch circuit take-offs can be made at various floors, eliminating separate circuits and long conduit-cable runs from the main switchboard. Minimum voltage drop is assured by insulated copper bars on close centers.

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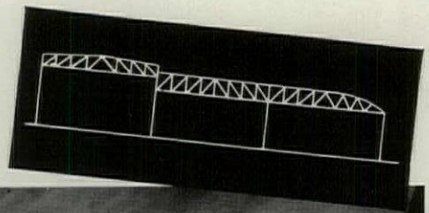
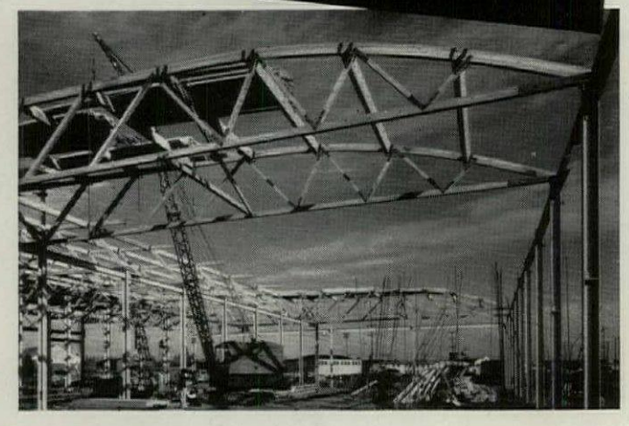
Pacific coast plant of Grinnell Company, manufacturers of automatic fire sprinkler systems. Area 1⅛ acres; trusses of 60-foot span combine features of parallel chord and bowstring types.





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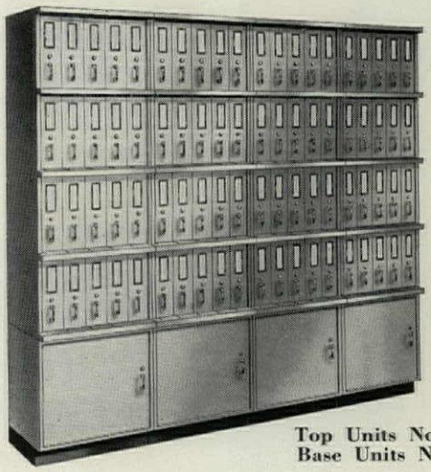

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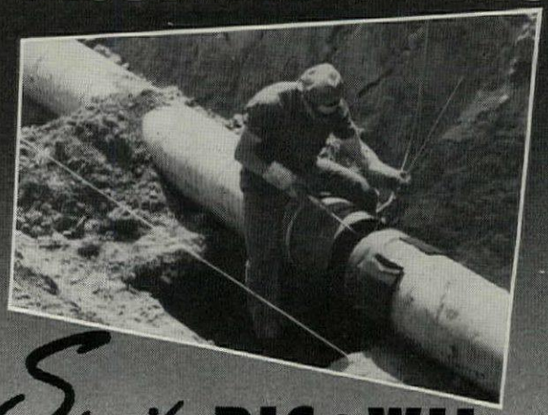

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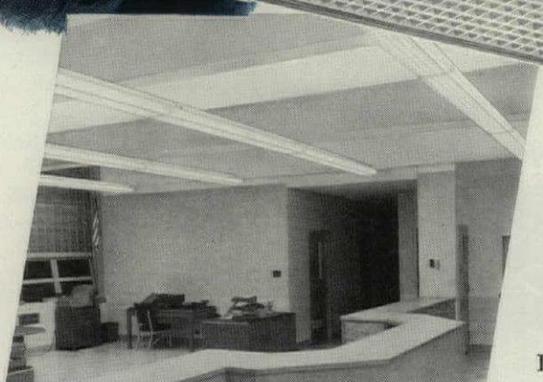

The "Officer"—Leader's finest fluorescent fixture for all commercial interiors where beauty of appearance is as necessary as lighting efficiency. Available for 2, 3, or 4 40-watt lamps (VL-240, VL-340, VL-440) also for Slimline lamps in lengths from 48" (VL-448) to 96" (NHC-280, NHC-380, NHC-480).



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WASTE VS. HEALTH

codes are too low, because they do not incorporate the results of recent investigations, such as the ventilation of walls, attic crawl spaces to prevent condensation; or they permit the use of fire escapes which experience has shown do not provide adequate exit facilities." . . .

"On the other hand, we have not developed, or at least only to a very small extent . . . any body of law or standards for law to cover the less obvious structural factors as they affect health: dampness and deterioration resulting from condensation, for instance; or audibility between adjacent apartments; or the quality and penetration of daylight; or the heat gradient in rooms." The report points out that many building refinements (which it considers essential standards for healthful living but are often labeled "luxuries") can be provided at little or no extra cost *if* the expensive construction practices needlessly necessitated by antique building codes can be eliminated.

Heating and ventilation, illumination, and noise control are covered authoritatively in three chapters well illustrated by diagrams and charts.

The structural means for meeting basic physiological demands should not only be of interest to health experts but of great practical value to architects and lighting engineers.

Another section deals with household equipment and facilities for food handling and laundering with regard to design and placement for efficiency and avoidance of physical and mental fatigue. It contains some data on comfortable working heights for various household duties which may be surprising to advocates of well groomed counter tops leveled 36". Home accidents and their avoidance through proper design are also treated.

The first chapter, *The Structural Framework of the Dwelling*, was drafted by architect and city planner Henry S. Churchill. C.-E. A. Winslow, Chairman of the Committee on the Hygiene of Housing and Professor Emeritus of Public Health, Yale University, wrote *Problems of Heating and Ventilation* and *Provisions for Sanitation in the Home*. Donald Y. Solandt, Professor of Physiological Hygiene, University of Toronto, contributed *Provision of Adequate Illumination*. Richard H. Bolt and Robert B. Newman of the Acoustics Laboratory at Massachusetts Institute of Technology collaborated on the chapter *Control of Noise*. *Equipment Essential for Good Housekeeping* was prepared by Enid Sater Ross, Housing and Household Equipment Div., Bureau of Human Nutrition and Home Economics, U. S. Department of Agriculture. National Safety Council's Director Thomas Fansler wrote the section on *Safety in the Home*. The final chapter *The Development of Legal and Administrative Standards for Dwelling Construction* was contributed by Howard P. Vermilya, Vice President, American Homes, Inc. and Charles S. Ascher, Professor of Administrative Law, Brooklyn College. Although each section was prepared by an authority or authorities in the particular field discussed, the book has a continuity in its frank and often blunt approach and in its practical idealism.

Construction and Equipment of the Home is the third work of a trilogy. The first volume, *Planning the Neighborhood*, which dealt with site and environment, was published in 1948. The second was put out last year. Entitled *Planning the Home for Occupancy*, it analyzed internal space arrangements. This current report concludes the series.

Although each chapter of the book was prepared by an authority or group of authorities in the particular field discussed, the book has a continuity in its frank, often blunt approach and in its practicable idealism. The language is plain—even in the technical sections on acoustics and lighting—but the facts are elemental, not elementary. Perhaps it was from long crusading experience that APHA learned those most effective expository writing devices—simplicity and directness. Perhaps it is just that they believe what they say. M.N.G.



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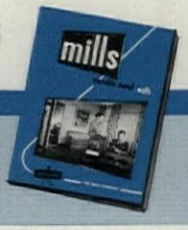


Immovable **walls, "frozen space", handicap any building. Why not investigate the possibility of installing Mills Movable Metal Walls *now*? Write for Mills Catalog No. 51 and specific recommendations to meet your specific space needs.**

How important is fire resistance?

For the architect who must meet not only building code requirements but also the client's budget, it's good practice to look realistically at fire resistance in acoustical materials.

Consider cost

In recent years, the importance of incombustible acoustical materials has been overemphasized in many cases. Since their cost is often twice that of combustible tiles, price can easily get out of line with value received. For example, it would obviously be unwise and uneconomical to insist on an incombustible material for use in a room containing such highly inflammable articles as draperies, furniture, carpets, and wood paneling. Acoustical materials—as only one of the interior finish materials—couldn't be expected to do the whole job of making the room "fire safe" under such conditions.

Fire safety in public buildings

Safeguarding human lives against fire is always vitally important. For this reason, incombustible acoustical materials should always be used in public buildings in corridors, staircases, areas near elevator shafts, entrance- and exit-ways, and other critical places that might affect the spread of fire. This is also true of theatres, night clubs, and other places where a great many people are concentrated in a relatively small space.

The real answer to the question of fire safety, however, lies in the basic structure of a building. If that building has a frame of steel and concrete, for example, the hazard of fire is greatly reduced. The soundness of its supporting members has much more to do with fire safety than any one of the interior finish materials it contains.

What about building codes?

Many cities have added provisions to their building codes governing the use of acoustical materials. These codes vary from city to city, some placing more emphasis on fire resistance than others. They usually refer to the federal government's classification system of fire resistance in acoustical materials. The chart on this page shows this system and the ratings of Armstrong's Acoustical Materials—Cushiontone, Travertone, Corkoustic, Arrestone, and Perforated Asbestos Board.

Most codes offer considerable freedom in the selection of materials. Let's look briefly at the main provisions of the building code of a large eastern city: In a building that's rated fireproof, with fireproof walls and doors separating the rooms from each other and from corridors and elevators, up to 2,000 sq. ft. of perforated wood fiber tile—like Armstrong's Cushiontone—can be installed per room. It must be applied directly to a solid fire-resistive surface. If the tiles have a fire-resistant finish—recognized as "slow-burning" by Federal Specification SS-A-118a—up to 5,000 sq. ft. per room can be installed. Wood fiber materials are not permitted in corridors or stairways, adjacent to elevator shafts, or in rooms of public assembly.

In buildings classed as non-fireproof, up to 3,000 sq. ft. of wood fiber material per room can be used providing the amount isn't more than 50% of the area of any floor. The code requires that tiles be installed over plaster, gypsumboard, or other incombustible material. Up to 6,000 sq. ft. of wood fiber tile per room can be installed if the material has a slow-burning paint finish.

This typical code makes it clear that architects, though limited to an extent, can still use sound judg-

THE CLASSIFICATION OF ARMSTRONG'S ACOUSTICAL MATERIALS

INCOMBUSTIBLE	Arrestone—perforated metal pan with mineral wool pad	
	Travertone—fissured mineral wool	
	Perforated Asbestos Board—asbestos tile with glass wool pad	
FIRE RETARDANT	None	
SLOW-BURNING	Cushiontone—perforated fiber tile with fire-resistant paint finish	
	Corkoustic—100% cork tile	
COMBUSTIBLE	Cushiontone—perforated fiber tile without fire-resistant paint finish	

These classifications have been established by the U. S. Federal Specification No. SS-A-118a, Paragraph E-3c, published by the Bureau of Standards.

ment in selecting proper acoustical materials. For example, it refers to the use of fire-resistant paint. Most building codes—and the federal government—recognize that the special fire-resistant paint finish on Armstrong's Cushiontone, a wood fiber tile, will render it "slow-burning." Thus on many jobs where a combustible material such as Cushiontone offers more desirable physical characteristics than one that's incombustible, this special finish makes it a satisfactory choice.

The code above also recommends the use of fire-resistant backings. Plaster, plasterboard, gypsum lath, and gypsum sheathing all provide good properties of fire resistance—enough to meet many needs under building codes. They often contribute more to fire safety than the acoustical material itself. Your Armstrong Acoustical Contractor can suggest proper installation methods and acquaint you with local provisions, if any.

Other factors

There are many other factors that should not be overlooked in selecting an acoustical material. One of them is the frequent difficulty, at present, in obtaining incombustible tiles because of material shortages. Many acoustical materials which are classed as slow-burning may well be used to satisfy fire safety requirements.

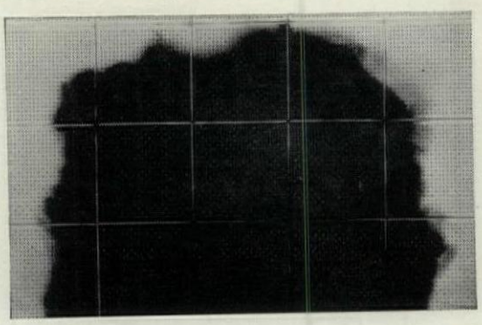
Other important considerations in the selection of a material are acoustical efficiency, beauty, moisture resistance, light reflection, insulation value, installation methods, and maintenance.

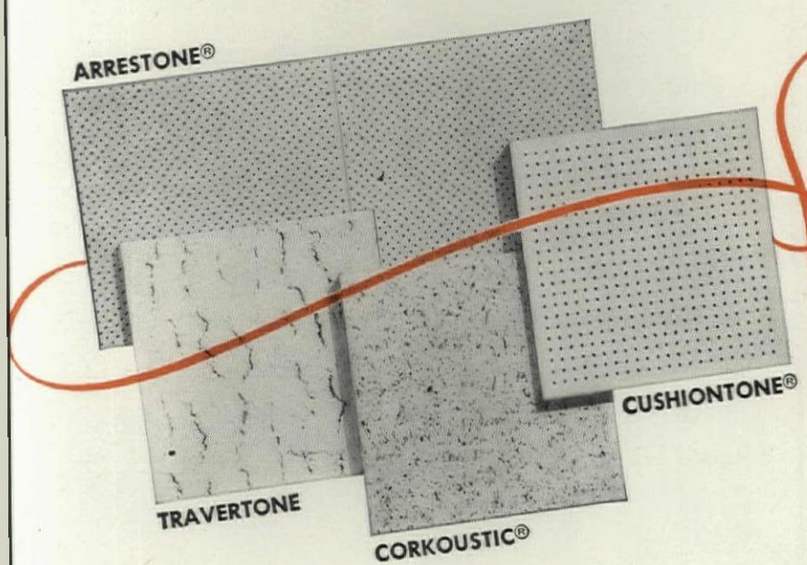
SEND FOR FREE BOOKLET, "How to Select an Acoustical Material," which answers many other questions about sound conditioning. Write directly to Armstrong Cork Company, 5405 Stevens Street, Lancaster, Pennsylvania.

Cushiontone's slow-burning paint finish prevents flames from spreading in Hartford Hospital fire

The corridors of a new hospital in Hartford, Connecticut, were sound conditioned with Armstrong's Cushiontone, having the slow-burning paint finish. Ten days before the hospital was scheduled to open, a fire broke out in a basement room. This room contained furniture wrapped in excelsior and paper, which is highly combustible. The blaze became hot enough to crack the plaster, blister and peel the paint on the door, and break the glass in the door. The flames surged through this opening and into the corridor, but the Cushiontone ceiling prevented the fire from spreading beyond this point. The acoustical tile itself was charred in 3-foot semicircle but did not burn.

When flames are applied to Cushiontone's special slow-burning paint finish, the tiles char and blacken but do not readily burn or aid spread of flames.





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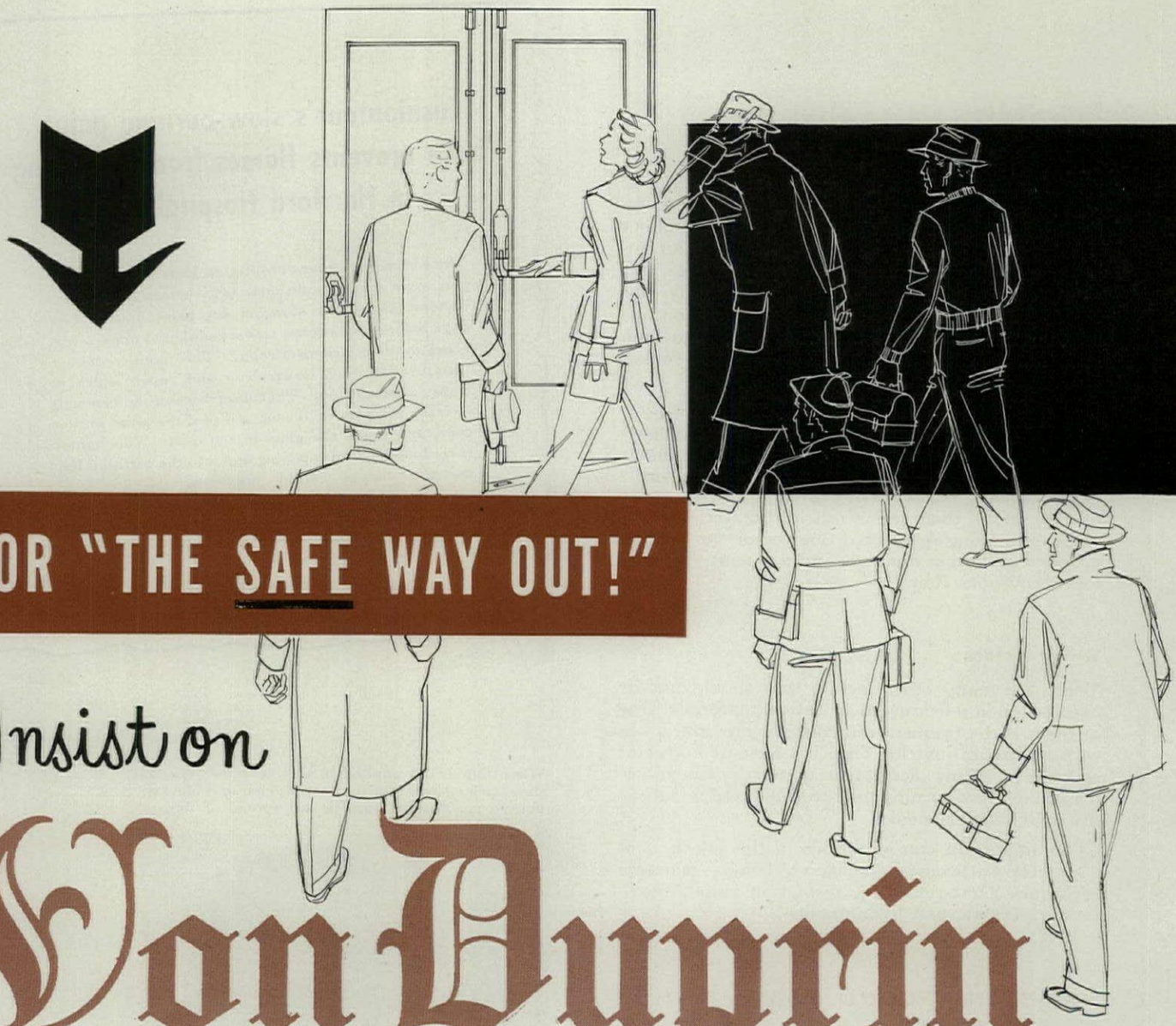

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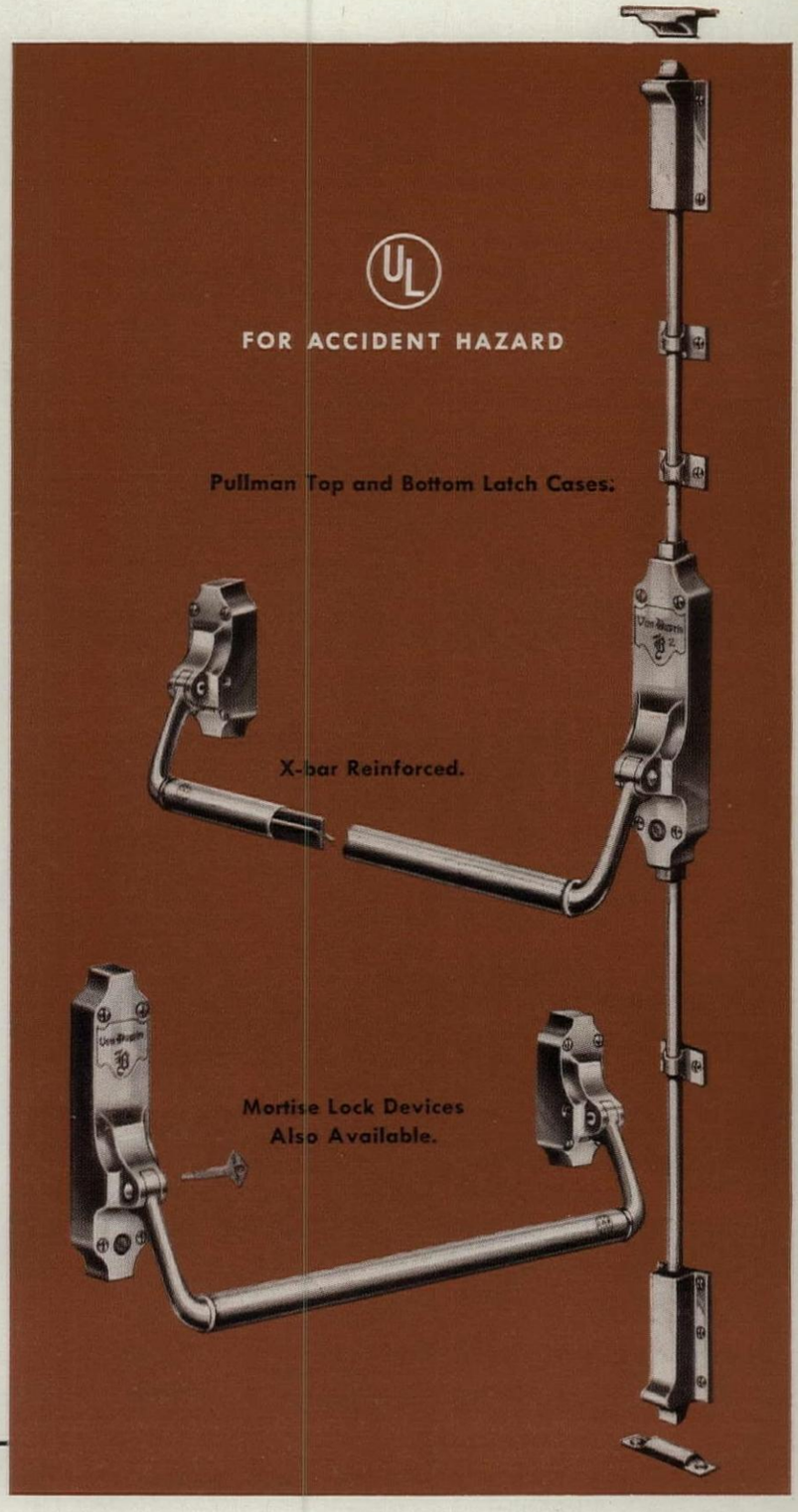



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PREFABRICATION

(Continued from page 137)

Although the turn of the century brought many attempts at precutting and packaging (including an ill-fated effort by Sears Roebuck), prefabrication did not become a real movement until the early Thirties when the country tried to build itself out of the Great Depression, and the challenge of prefabrication tempted Big Business into the field. (Such big names as these entered the field in one way or another: U. S. Steel, Bethlehem Steel, American Car & Foundry, Pullman, Celotex, Johns-Manville, U. S. Gypsum, American Radiator, General Electric and Weyerhaeuser.) While Big Business gradually backed out, it neverthless fostered the development of several prefabricators which for a long time ranked as the industry's leaders: 1) General Homes Inc., 2) Houses Inc., whose key personnel later parted company to form 3) Gunnison Housing Corp. and 4) American Houses Inc.

Many of the early entrants into the field embarked on grandiose schemes for rehousing America in metal, but by the late Thirties, these ambitious technical efforts had been discarded in favor of more conventional wood construction, the production goals had been trimmed to more modest levels and the prefabrication operation itself had been reduced to mere panel assembly. By 1940 only about 30 firms were left and only about 10,000 houses had been produced in the preceding five years—less than 1% of the nation's total output of single-family, nonfarm houses in that period.

The Thirties were nevertheless an important formative period in the history of prefabrication. Author Kelly summarizes them thus:

"These . . . were the characteristics of prefabrication in the Thirties: a huge amount of interest, but few houses; active participation in various ways by non-commercial institutions, government agencies, and the large corporations; a profusion of structural ideas only a few of which were technically and economically sound; and the failure of these to achieve real commercial success on a large scale because no one had yet brought together enough intelligence and capital to develop an integrated building organization whose operations extended from the procurement of materials through manufacturing to selling, financing, erecting, and servicing the home. Among the firms which sold houses on a continuing basis there were several noticeable traits. There had been a retreat from steel to wood, and from flat roofs and battens to Cape Cod cottages. On the average, more and more was being included in the house package, though as yet few companies had gone beyond the shipping of wall panels and either panelized or precut floor and roof members to the packaging of a complete house with all materials and mechanical equipment. There was, furthermore, a very minimum of prefinishing. And, in the field of distribution, there were at least two emerging patterns, besides those of the firms which catered to such specialized shelter needs as vacation cottages and oil field dwellings. One was the dealer organization, exemplified by Gunnison, through which many dealers sold houses one at a time to a customer at a time; the other was the array of contractors and operative builders through which American Houses was selling its product in large groups to an anonymous market."

Prefabrication in wartime

In the early Forties prefabrication went to war and gave a good account of itself in filling the need for houses which could be put up fast with a minimum of labor and could later be demounted and moved. The industry shifted into high gear and in 1941 alone produced more than 18,000 units. Of the 100 companies in the field, at least 20 had more than 1,000 houses behind them and were fabricating more than 100 per month. The CIO hopped on the prefabrication band wagon and for the first time made extensive, if temporary, inroads on AFL's balliwick in the building industry. The industry's growth was further signalized in 1942 by formation of the Prefabricated

(Continued on page 268)



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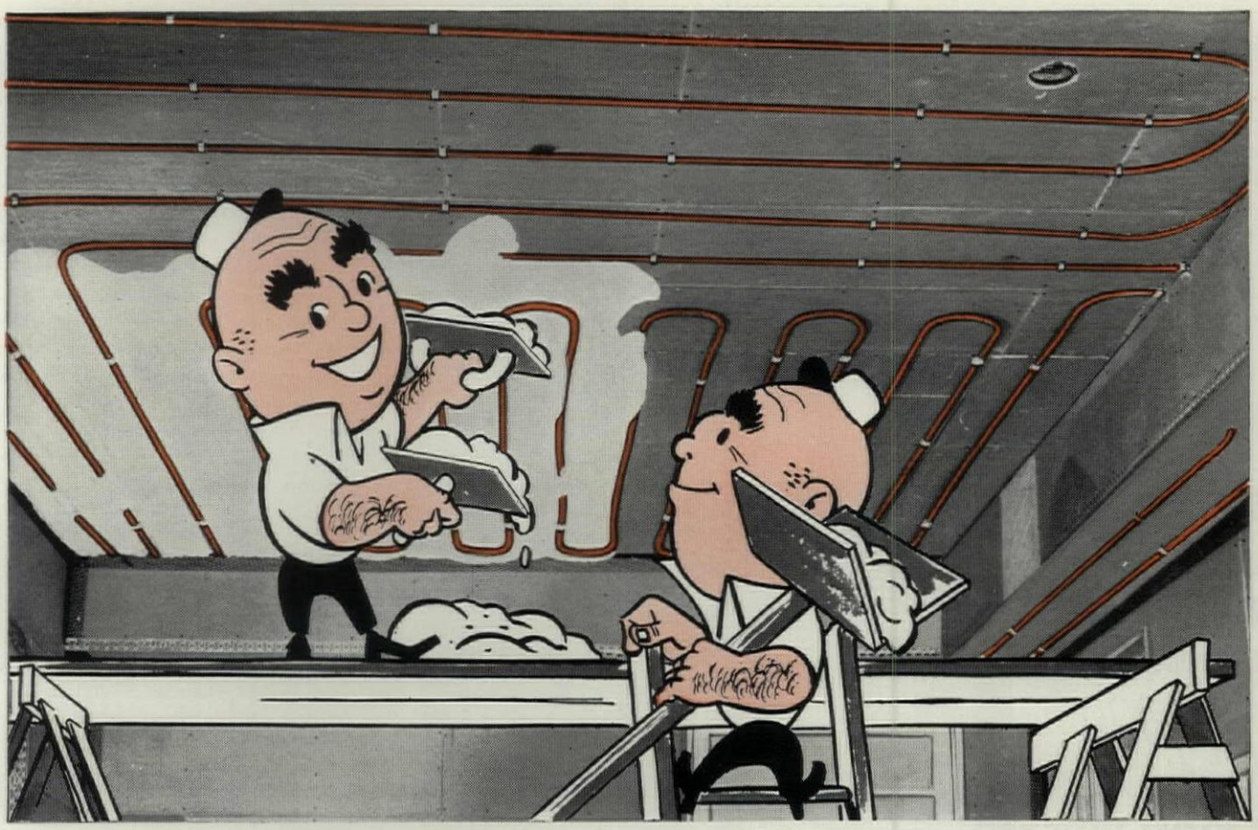

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Home Manufacturers Institute, an association.

While prefabrication may have accounted for 200,000 units during the war (one-eighth of the total), the biggest contribution was made by builders who employed advanced on-site techniques (some admittedly borrowed from the prefabricators) to build huge projects in jig time and at low cost. Thus, the war period saw more home building progress than prefabrication progress. From the nation's wartime housebuilding experience emerged the big local builder—not the big central prefabricator, as had been expected. Comments Historian Kelly:

". . . The contributions of the 'established' prefabricators (as of 1940) in 'know how' were perhaps less valuable than their general knowledge of the building operation. This may be a sign of their weakness at the beginning of the war period, for other firms with little or no previous experience in prefabrication found it possible to enter the field and to build quite as readily, quite as successfully, and quite as profitably, as the established prefabricators. It is probably also an illustration of the fact that emergency production for a single consumer—a government at war—requires a pattern of operations very different from that suited to the private sale of houses in normal times. To be sure, in industries other than housing persons with no previous experience in the field were successful operators, notably, for example, in shipbuilding. But it is hard to think of an industry in which this was so markedly the case as in prefabrication. After a decade or more of gestation, the industry had not arrived at the point where it could make a really unique and major contribution. . . ."

Spoon feeding by Government

At the close of the war the prefabricators still numbered close to 100. But not for long. The ranks swelled when the National Housing Agency granted priorities for materials to such manufacturers—by the end of 1946 they totaled 280, many of them prefabricators more in name than fact. They produced 37,200 houses in 1946, 200 more the following year. Meanwhile, Housing Expediter Wilson Wyatt and RFC had used production loans to inspire the launching of several new prefabrication ventures of a radically different concept (Lustron, et al) and had tried to prod the old-line companies into increased production with guaranteed market contracts.* But these Government efforts failed. By the end of 1947 the number of active prefabricators was again less than 100 and says Kelly, "in the wake of the failures there had grown a profund skepticism regarding all that went by the name of prefabrication—especially in banking circles." But Kelly is not completely discouraged: "This purging of the prefabricators was somewhat reminiscent of early years in the automobile industry, and, if the outcome is as healthy, there may still be cause for optimism."

One reason prefabrication has had a tough time in recent years is the rapid growth of the large scale operative builder who was nursed on FHA's revolution of mortgage finance and who cut his teeth in the war housing program. Today he matches the prefabricators' costs and thus steals his thunder.

"For a one-house project the prefabricated house will typically show some cost advantage, perhaps as much as 10—20%. As the size of the project increases, the cost advantage of the prefabricator is apt to decrease and the nature of the so-called 'conventional' construction process will change, the site builder adopting more and more of the techniques used by the prefabricator until, in the very large projects of the operative builder, the prefabricator typically offers no cost advantages. The most efficient housebuilding (as measured by cost per square foot) has been done in such large projects. . . . Although the pre-

(Continued on page 274)

* The government entered into 20 such contracts for 61,700 houses. Only 3,000 houses were produced and the government lost $3 million in the deal.

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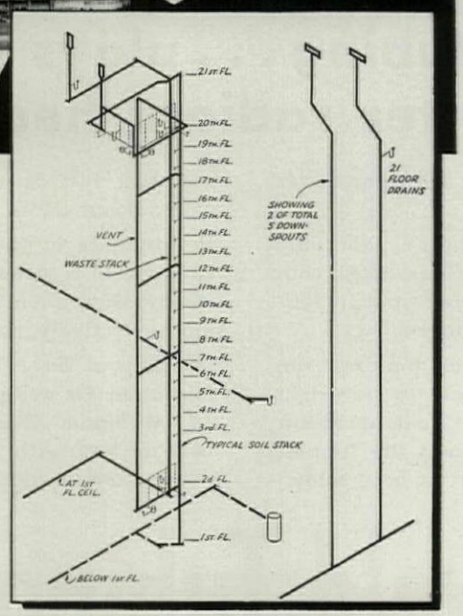

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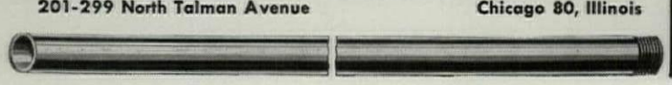



Above: Coral Kalistron in elevator corridors of Crowell-Collier Building, New York City. Blue Kalistron covers corridor chairs. Architects—Leonard Schultze and Associates.

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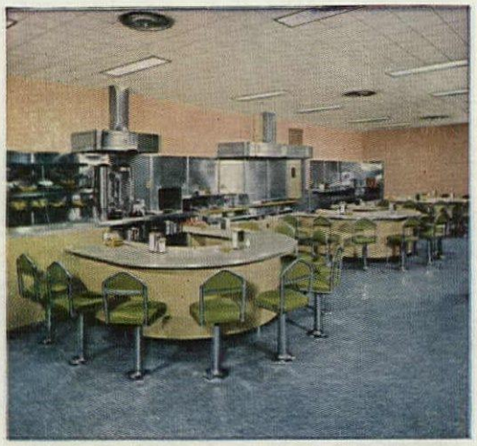

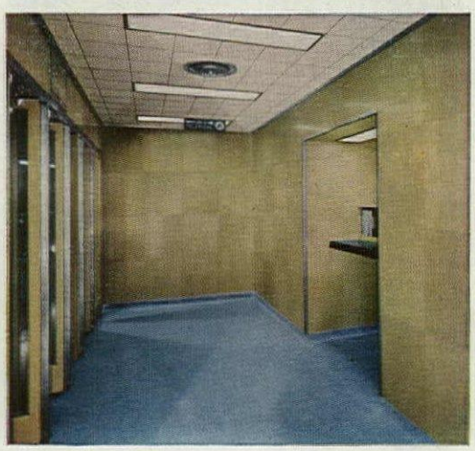

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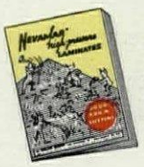

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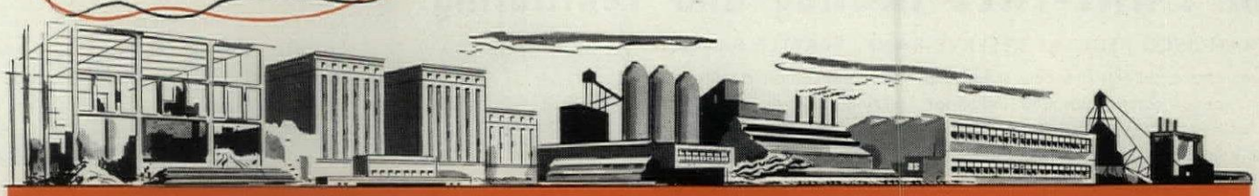

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fabricator has not often been able to produce at lower costs than the big operative builders working in the great metropolitan areas, he has clearly demonstrated his ability to compete with the lowest-cost housing produced in the smaller urban areas where the operations of such large builders cannot be continuously sustained."

How much prefabrication

Why has prefabrication taken so long and had such a difficult time progressing as far as it has? One answer lies in the small proportion of the total housebuilding operation which is actually handled in the factory and, in turn, the prefabricator's limited influence on the ultimate cost of his product. Kelly's studies indicate that the average prefabricator's package represents only about 48% of the value of the finished house, exclusive of land and improvements, and that only about 35% of the package was actually created by the prefabricator. Thus the prefabricator's contribution measured by value added in manufacture amounts to only about 18% of the retail price of the house—and substantially less when the cost of land and site improvements is considered. (This figure compares with 32% in the auto industry; 49% in furniture manufacture and 70% in machine tool making.) Says Kelly: ". . . his contribution is so small that his production position, from a cost point of view, might be termed precarious. Although this situation may not have been too well understood by some of the more enthusiastic proponents of prefabrication during recent years, it was pretty generally appreciated by members of the industry."

The relative importance of the house factory may also be measured in terms of labor. The typical prefabricated house (24 x 32′) represents about 250 man-hours of factory labor and 450 man-hours of site labor, exclusive of grading, utilities and foundation. (A conventionally built house of comparable size usually requires at least 1,500 man-hours of site labor.) In other words, only one-third of the work is done in the factory. And, labor saving in the factory is partially offset by the fact that factory overhead normally runs 100% or more, while overhead on the site seldom goes above 10%.

These statistics indicate the prefabricator's difficult position: He must rely on his performance of a small part of the total building operation — factory fabrication — to beat the conventional builder's costs. And more often than not he merely meets these costs.

Why prefabricators fail

Immediately after the war several hundred companies took steps to enter prefabrication. Most of them either failed to get into production or failed later. Why? To find out, Kelly checked 100 of these companies including those generally considered to be among the soundest. Of these 42 had failed, including 12 which never got into production. Three took a second look at the marketing problems and gave up without trying, two could not find licenses for their production schemes, one (Fuller's round house) lacked capital and FHA approval, another was scared off by high labor and material costs, three suffered from inexperienced and unintelligent management, four tied up their money in plant costs and wound up with insufficient working capital, four attributed their failure to material shortage and one failed to re-open after his plant burned down.

However, more than any other reason, marketing was given as the sole or contributing reason for the failures, and several of the companies still in operation frankly admit they were faced with marketing problems of large proportions.

In the rash of failures which has pock-marked prefabrication's past, Biographer Burnham Kelly has uncovered at least one hopeful sign: "One midwestern dealer . . . preferred to do business only with companies which had gone through bankruptcy. They were the only ones, he said, which understood very clearly the facts of life in the prefabrication business, and with them he felt the chances of success looked good."

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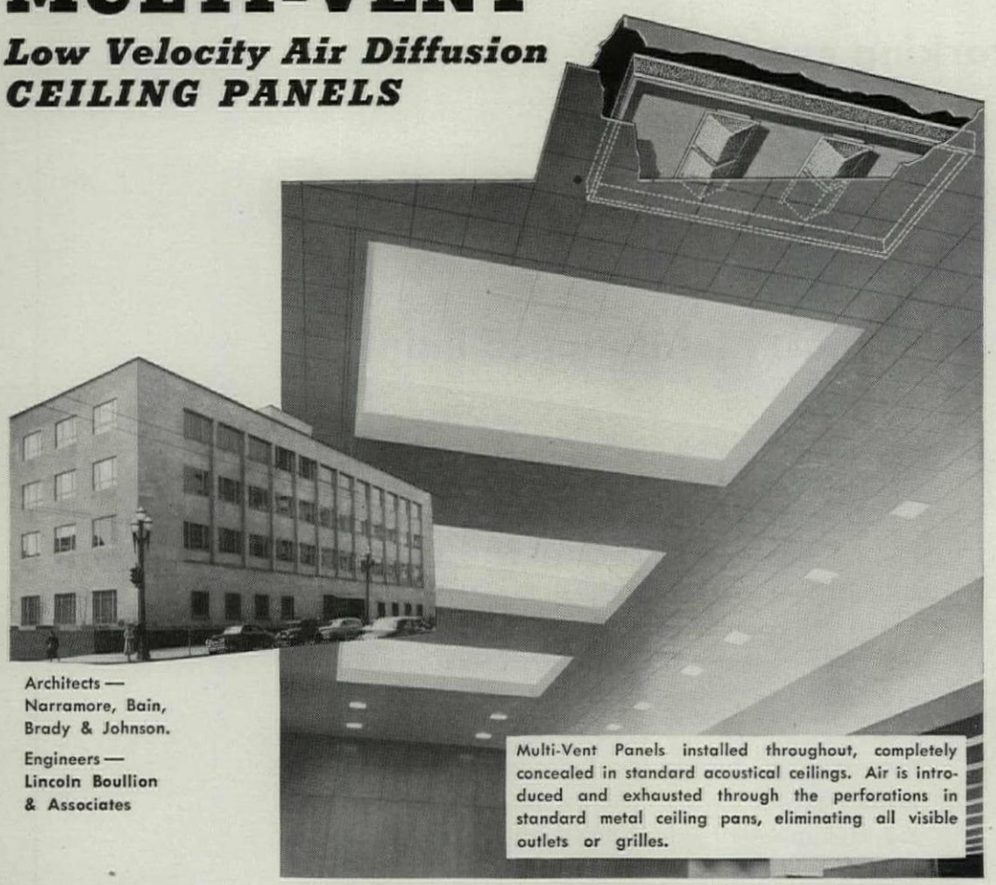

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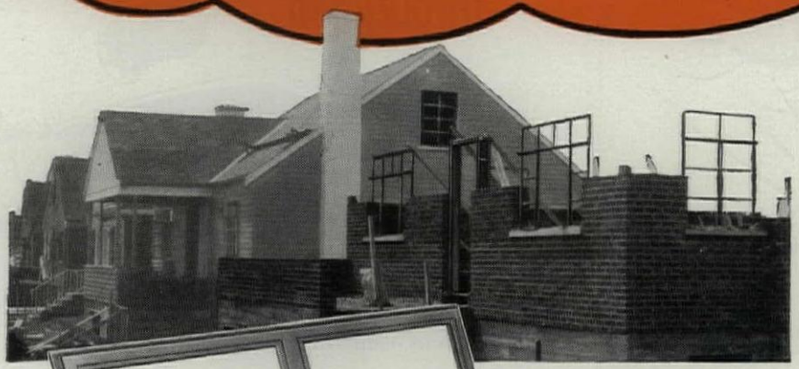



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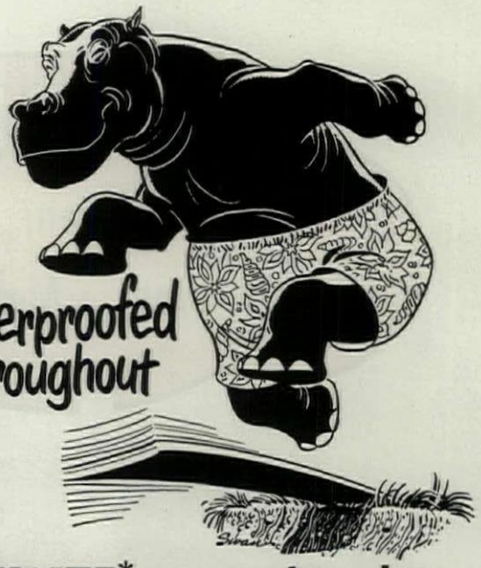

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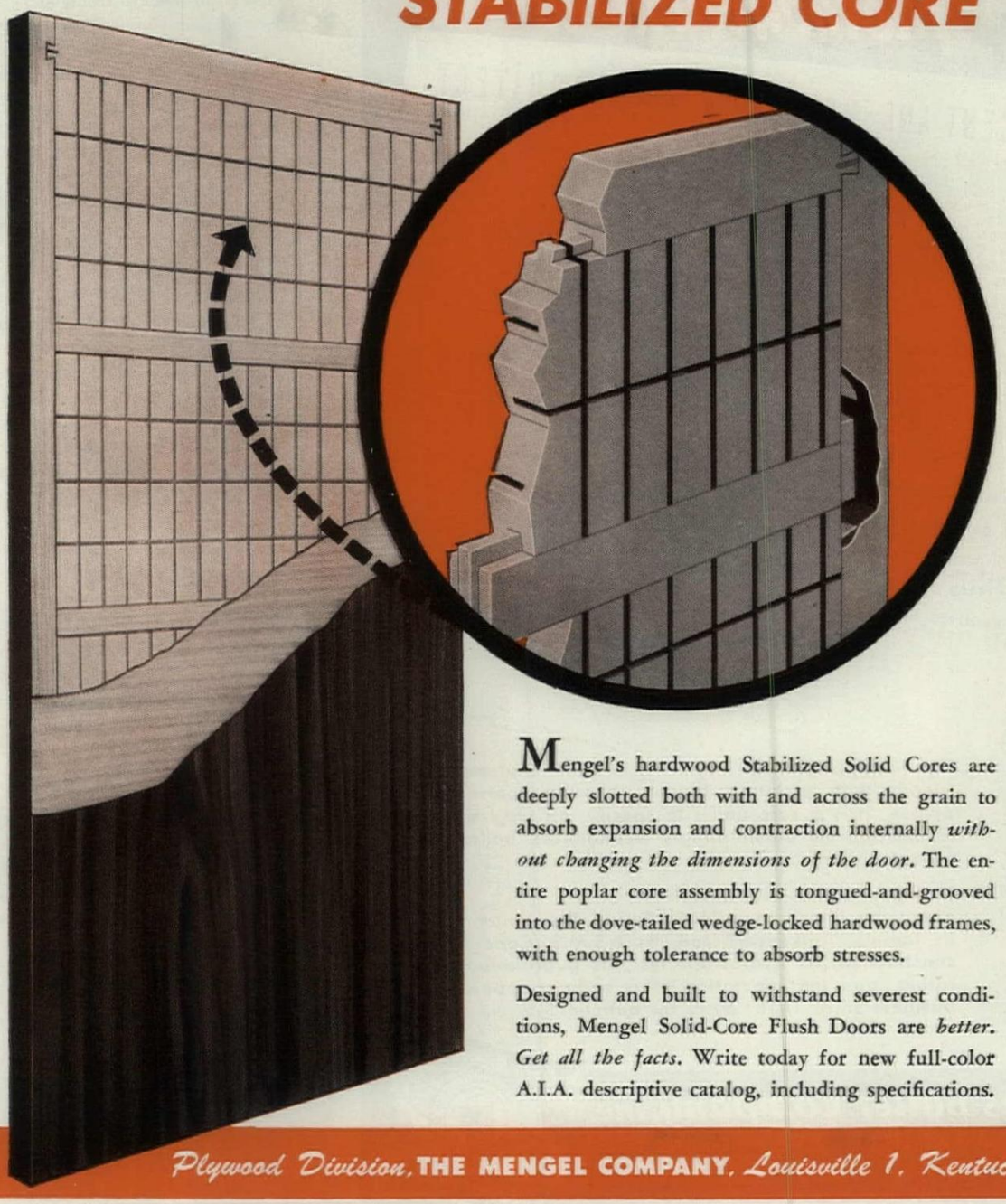

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AN INTRODUCTION TO MODERN ARCHITECTURE. By Neville Conder. Pellegrini & Cudahy, New York, N. Y. 96 pp. 7 x 9. Illus. $2.50.

Ever since modern architects started looking for clients, pamphleteers have provided them with ammunition with which to bombard the skeptics, both lay and professional. Mr. Conder's admirable little book (first published in England) is the latest pamphlet of this sort; and since he covers the same ground already covered by some of his predecessors in Europe and the U. S., the story is quite familiar. However, it has rarely been told so well, or so intelligently.

If you look through all the modern architecture pamphlets put out during the past couple of decades, the first thing that strikes you is a gradual but very marked shift in emphasis. In the early Thirties the English critic Anthony Bertram adopted Le Corbusier's "Machine for Living" as his motto, only to discover that pure functionalism gave a lot of his readers an acute case of goose pimples. Then J. M. Richards and Elizabeth Mock produced their much more learned effort, whose emphasis seemed to be somewhat more historical, somewhat more technical and somewhat more sociological. Finally, in the early Forties, the Museum of Modern Art came out with a *pronunciamento* which, like the Richards-Mock thesis, told people in effect that modern architecture was *good* for them, like lemon juice before breakfast. All along, in other words, the pamphleteer's tone was defensive; on occasion, he would even assert that modern architecture was cheaper and thus compromise the reputation of about 99% of all modernists in the eyes of their clients.

Mr. Conder has now produced a beautiful synthesis of all these theories. His historical background sketch is concise and accurate. His discussion of modern technology is straightforward and not over-emphasized. He stresses economics, sociology and politics no more than any contemporary historian in any field would have to stress them. And he sums up this synthesis in a simple statement: "New methods produce new forms; new materials give new effects. But without new means of expression the promised amenities cannot materialize: *technical progress becomes a restriction to art instead of being an incentive to new visual pleasures.*" (Our italics.)

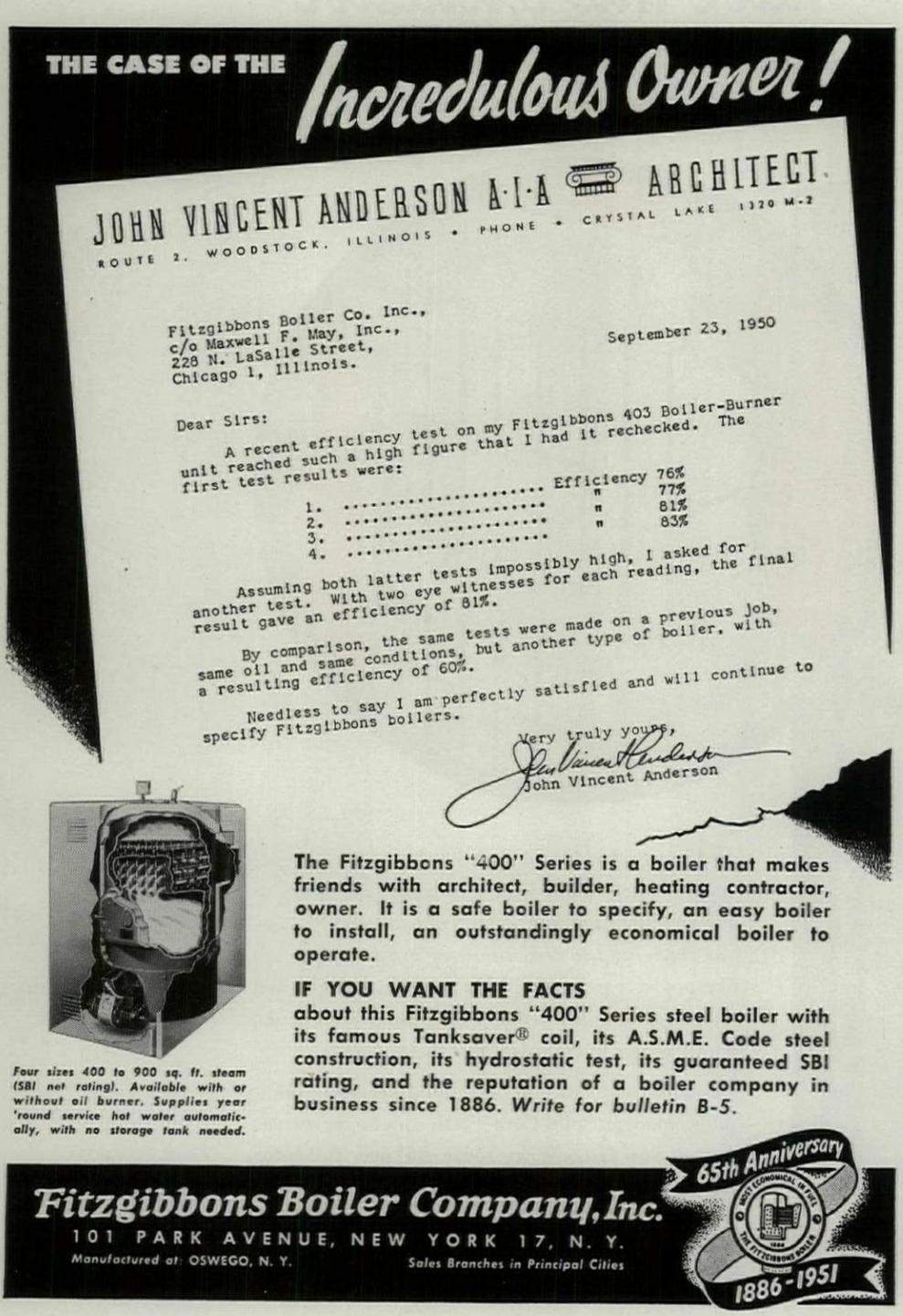
Like all historical surveys published in our subdivided world, this book shows a certain bias in favor of examples found in the author's native bailiwick. However, this is true only in its illustrations. One wonders how a survey such as this could have omitted Mies van der Rohe's Barcelona Pavilion or his Tugendhat House (shown only in plan); or why the author felt compelled to illustrate so many indifferent modern buildings put up in England during the past decade, and so many vine-encrusted, 7-story apartment "cottages" built recently by our sentimental Scandinavian and Swiss friends.—P.B.

SEASONAL UNEMPLOYMENT IN THE CONSTRUCTION INDUSTRY. Prepared for ILO Building, Civil Engineering and Public Works Committee, Third Session, Geneva, 1951.

In its 30 year history, the International Labor Organization has achieved a reputation for sound, cautious pioneering in the cause of labor welfare and economic stability. An autonomous associate of the League of Nations following World War I's Versailles Peace Treaty, it now serves the UN in a similar capacity, formulates international standards which need not be accepted, but must be studied by all 60 member nations.* Through its Building, Civil Engineering and Public Works Committee, attention is focused on the specific problems of the construction industry, with seasonal unemployment a chief concern of the committee this year. This succinct report, designed to serve as a basis for discussion at the

* Soviet Russia resigned from ILO when it left the League, has never rejoined.

(Continued on page 282)





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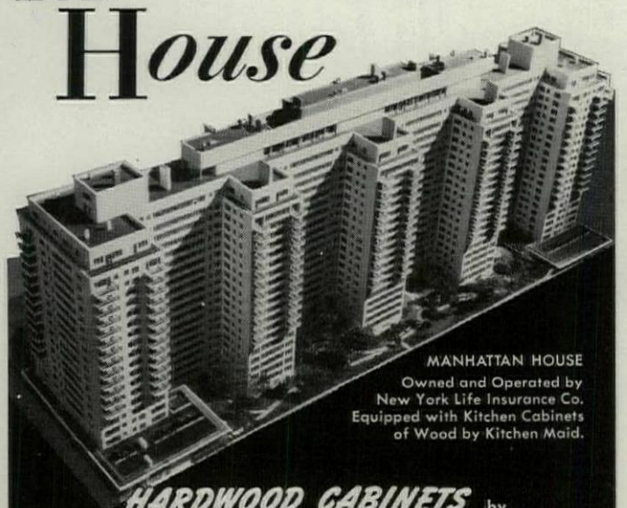

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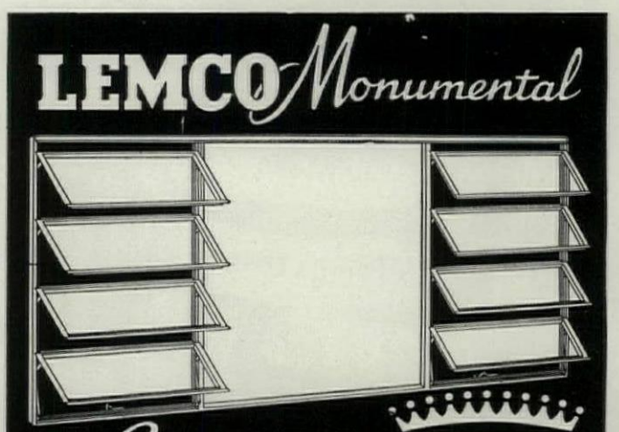

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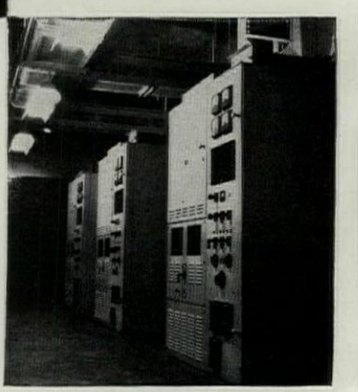

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Committee's 1951 session in Geneva, describes the world-wide pattern of seasonal unemployment, analyzes the causes, summarizes the benefits and techniques for its elimination.

Chief reasons for seasonal unemployment according to ILO are: climate, social customs (i.e. traditional buying customs and leasing dates) and the general level of employment of the economy. Another major cause stems from the very nature of the industry itself. The many small enterprises which populate the industry find it difficult to use the known methods of winter construction, since these usually imply both expensive equipment and elaborate techniques.

The urgency of the problem, the report states, is underscored by the great benefits to be derived from the elimination of seasonal unemployment. For the worker it means steadier employment and more stable annual income; for the employer, reduced labor costs, and lower overhead per unit of output; for the community reduced unemployment relief costs.

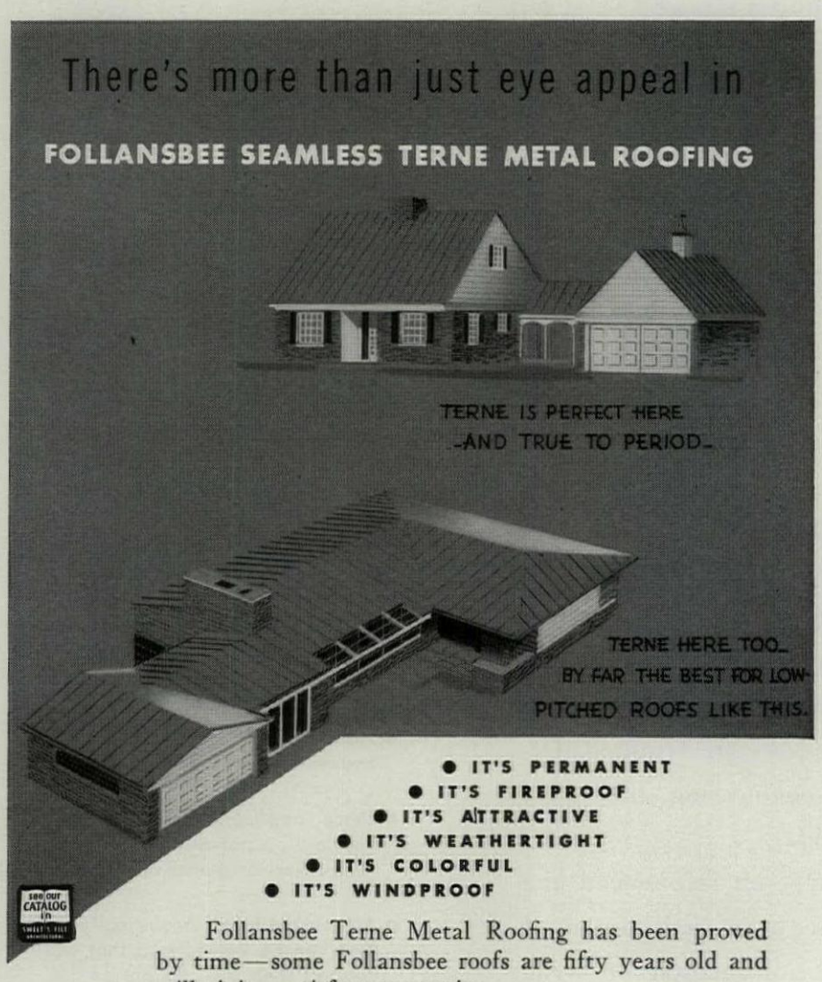
Of course, all remedies for seasonal unemployment are largely dependent on the technical feasibility of winter construction. By and large, the report feels, winter building is technically possible, except for some extremes of climate. Even concreting, the builder's most difficult winter task, can be done successfully by adding calcium chloride to the mix, preheating the aggregates, insulating and steam-heating the poured concrete or treating it with alternating electric current.

To this point, the remedies are plausible and tested. Other tentative solutions, however, are more controversial, less likely to be accepted by member countries. To decrease winter building costs, for example, the report suggests that construction trade unions might lower winter wage rates, this to be concomitant with cost reductions by materials manufacturers and construction contractors. This unrealistic proposal died in the report, was omitted from the Committee's 16 recommendations to the ILO Governing Body. Also advised for lowering winter costs are government subsidies, already tried by Sweden, Germany and Denmark. This shaky one was accepted by the Committee, with reservations, took the timid form of a request that governments "consider the possiblity . . ." The report, and the Committee, also favor: 1) timing of public works to pick up the winter slack and 2) education of the public to plan building programs for the cold winter months. Effective as all these remedies might be, the study acknowledges that no cure for seasonal unemployment is as devastating as a booming high demand such as we have experienced in this postwar period. RKB.

WELFARE IN THE CONSTRUCTION INDUSTRY.
Prepared for ILO Building, Civil Engineering and Public Works Committee, Third Session, Geneva, 1951.

This ILO report, prepared also as a basis for further study at the 1951 session of the Building, Civil Engineering and Public Works Committee, deals briefly with the possibilities of welfare development for construction labor. Its review of welfare conditions in various countries covers such topics as provision of protective clothing, shelter from inclement weather, washing and sanitary facilities and general environment of site camps. Also treated is the question of transport to and from work, often covered by monetary or time allowances when the distances are great. In the Netherlands, for example, "it has been stipulated that men who make use of a bicycle to reach their work, shall be paid compensation at the rate of 0.40 florins a day." Besides such engaging tidbits on welfare practice throughout the world, the report suggests that further improvement might result from clearer definition at the job level of site welfare amenities. Architects and engineers, it says, might well include specific welfare requirements in contract specifications. Also recommended is the appointment, whenever possible, of site welfare officers and camp committees to insure high welfare standards. Final

(Continued on page 286)



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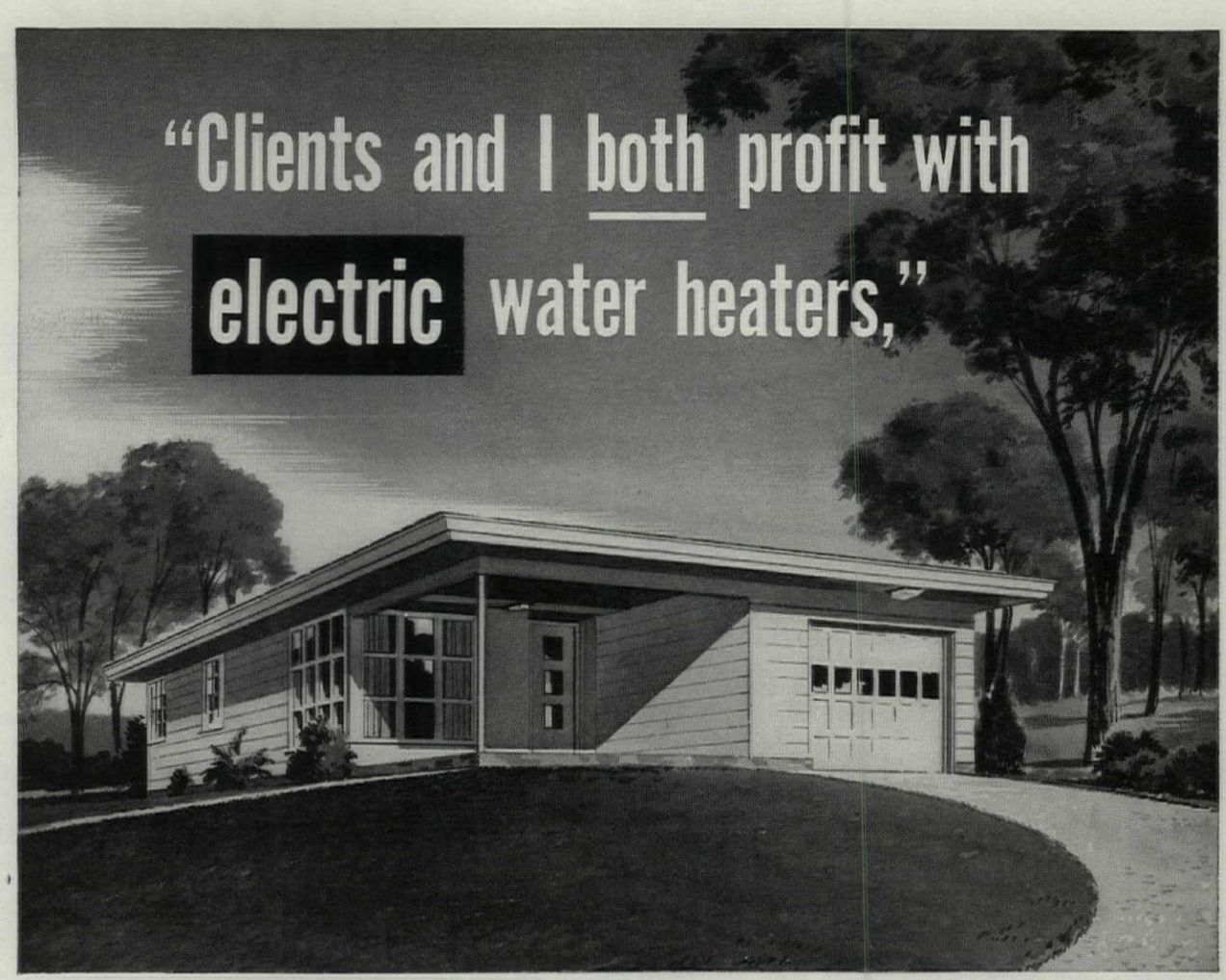

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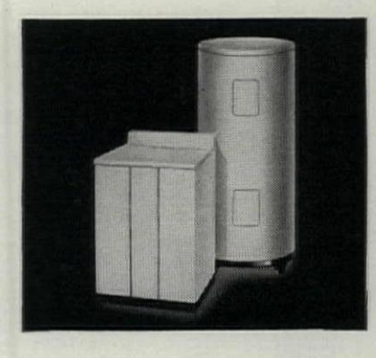

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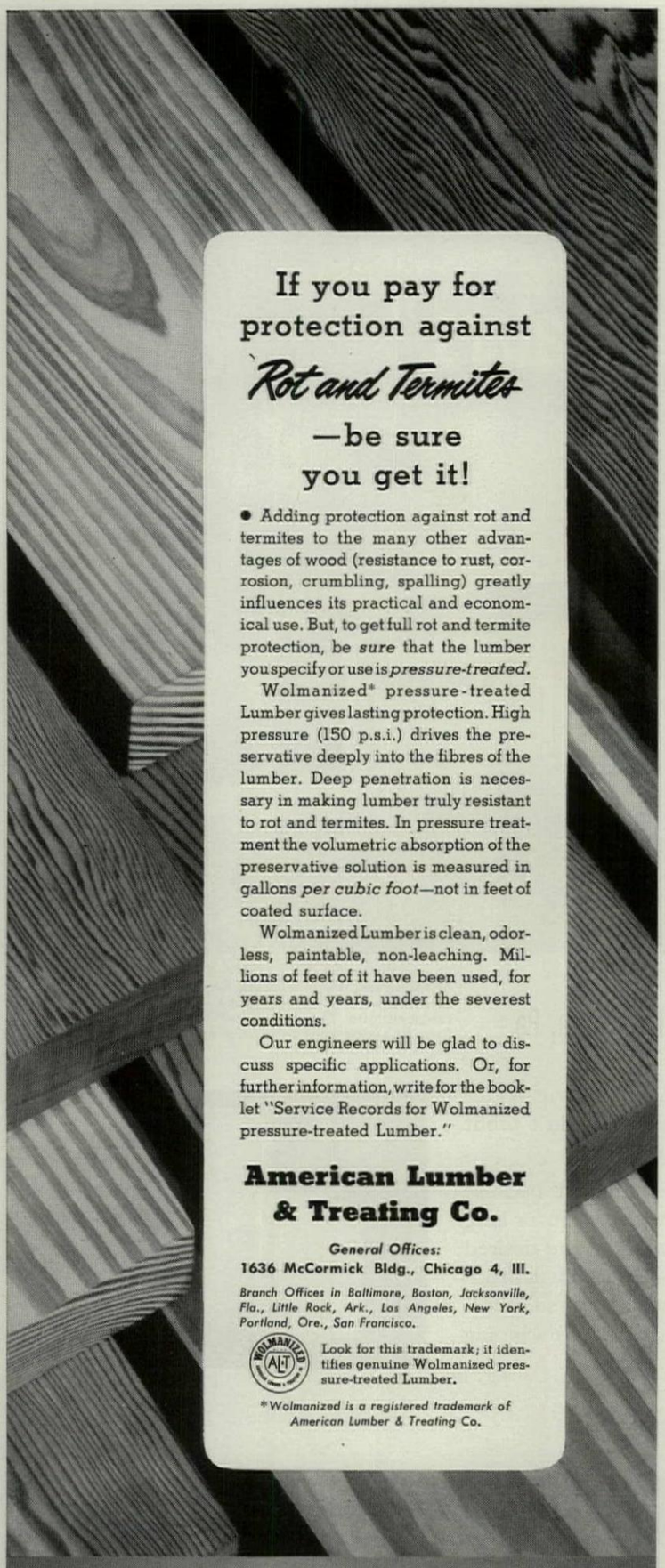

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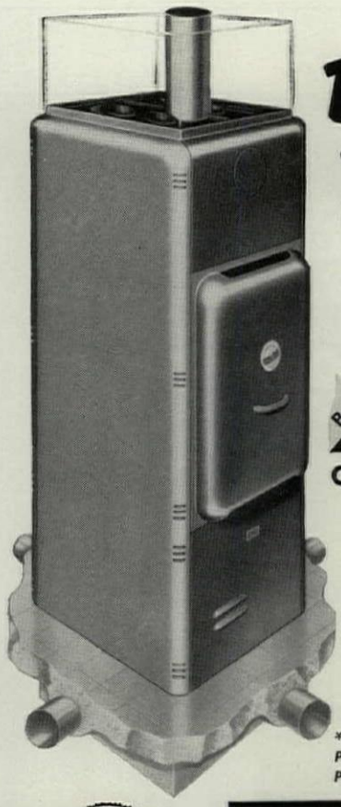

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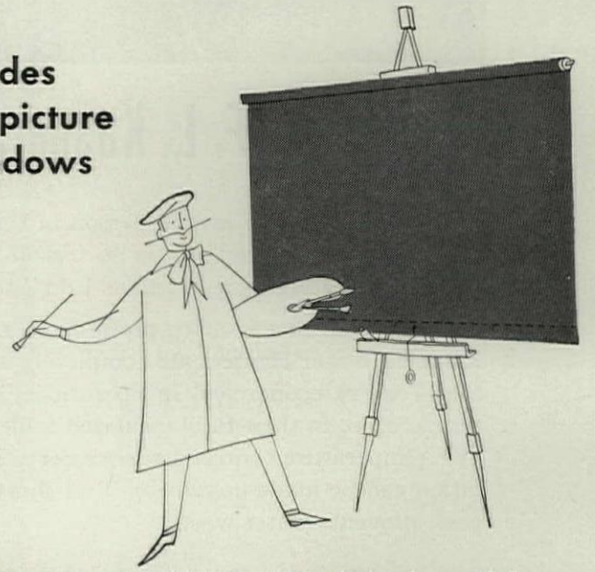



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City ..... Zone ..... State .....

REVIEWS

resolutions of the Committee, framed after discussion of the report, urged further investigation of welfare conditions in the construction industries of under-developed countries (India, Mexico, etc.), also strongly advocated the prohibition of employment of women and children in strenuous jobs on building sites. More than any other, this last proposal dramatically highlights the diverse and international make-up of ILO. Also proposed was a ten-point program of minimum welfare requirements for the guidance of member nations, ranging from weatherproof accommodations for meals to facilities for religious worship in residential camps. These proposals now await action by ILO's Governing Body. RKB.

DIE RAUMSTADT. By Walter Schwagenscheidt. Verlag Lambert Schneider, Heidelberg, Germany. 192 pp. 10 x 14.

One of the toughest city planning ideas to get across to anyone (and, especially, to city planners) is the principle of how to group buildings, of how to achieve orderly street patterns and of how to create a coherent townscape. *Die Raumstadt* (Spacetown) is a fresh and lively attempt to find out just exactly what it is that makes some cities fall apart visually and what it is that makes others hang together; what it is that gives a street or a public square a human scale (as opposed to an oversized monumentality that dwarfs the onlooker); and, finally, what it is that enables architects to reconstruct old, traditionally designed towns in a completely modern vein without destroying their coherence and unity. This last point is, of course, of tremendous importance in Germany's war-torn cities.

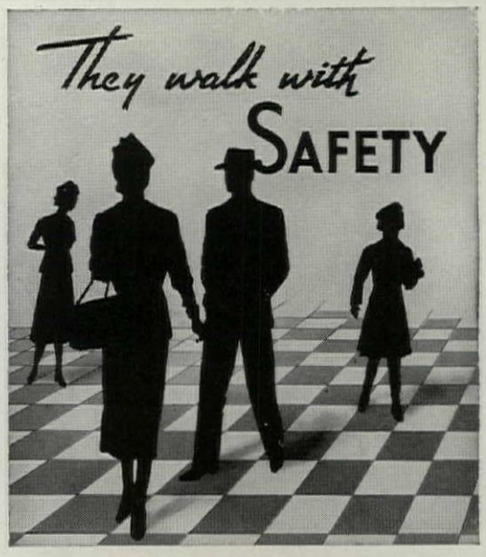
Very fortunately these questions have been dealt with in simple and excellent line drawings that tell the story on every page, so that it is hardly necessary to work one's way through the printed text. This is all the more fortunate because the text, for reasons best known to the author, was set in German longhand *script* rather than type, and because Herr Schwagenscheidt is addicted to a variety of whimsical prose that most readers will be delighted to pass up.—P.B.

TAX SAVINGS IN REAL ESTATE TRANSACTIONS, Bureau of Analysis, Davenport, Iowa. 98 pp. 11⅝ x 9. $5.00.

This book is a working tool for the easy solution of tax problems affecting all types of realty transactions. Sponsored by the National Institute of Real Estate Brokers of NAREB, it uses a functional, editorial approach to federal income taxes, assists taxpayers in planning property sales in advance to achieve maximum legitimate tax savings. RKB.

AN INTRODUCTION TO TUDOR ARCHITECTURE. By John Harvey. Pellegrini & Cudahy, 41 E. 50th St., New York 22, N. Y. 96 pp. 7 x 9 in. Illus. $2.50.

A short study of the last phase of Gothic—half of it pictures and sketches.



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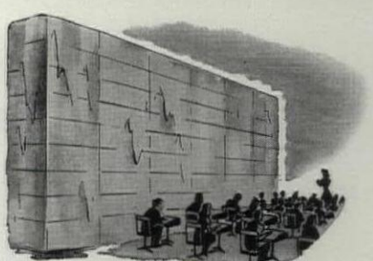
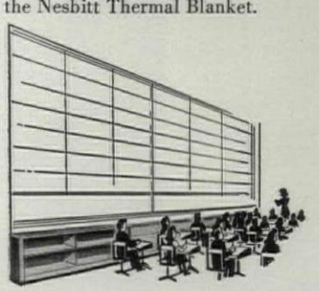
NESBITT Syncretizer with WIND•O•LINE





Large windows become a "wall-of-ice" on very cold days—unless shielded by the Nesbitt Thermal Blanket.



ONLY NESBITT GIVES YOU THIS "THERMAL BLANKET"

The trend toward larger areas of fenestration in the modern schoolroom makes greater demands of the heating and ventilating unit. The "thermal blanket" provided by the Nesbitt Syncretizer adequately shields occupants against the window "wall-of-ice" in normal situations; but under conditions of extremely long glass exposure and very low outdoor temperatures, an "extra blanket" is called for. Nesbitt WIND•O•LINE meets such needs.

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WIND•O•LINE is also available with The Nesbitt Package, recessed in a channel at the rear of the storage units . . . but it is not necessary to install storage cabinets to get this extra protection. WIND•O•LINE is yet another Nesbitt innovation which permits more of America's schools to enjoy the *new standard of classroom comfort.*

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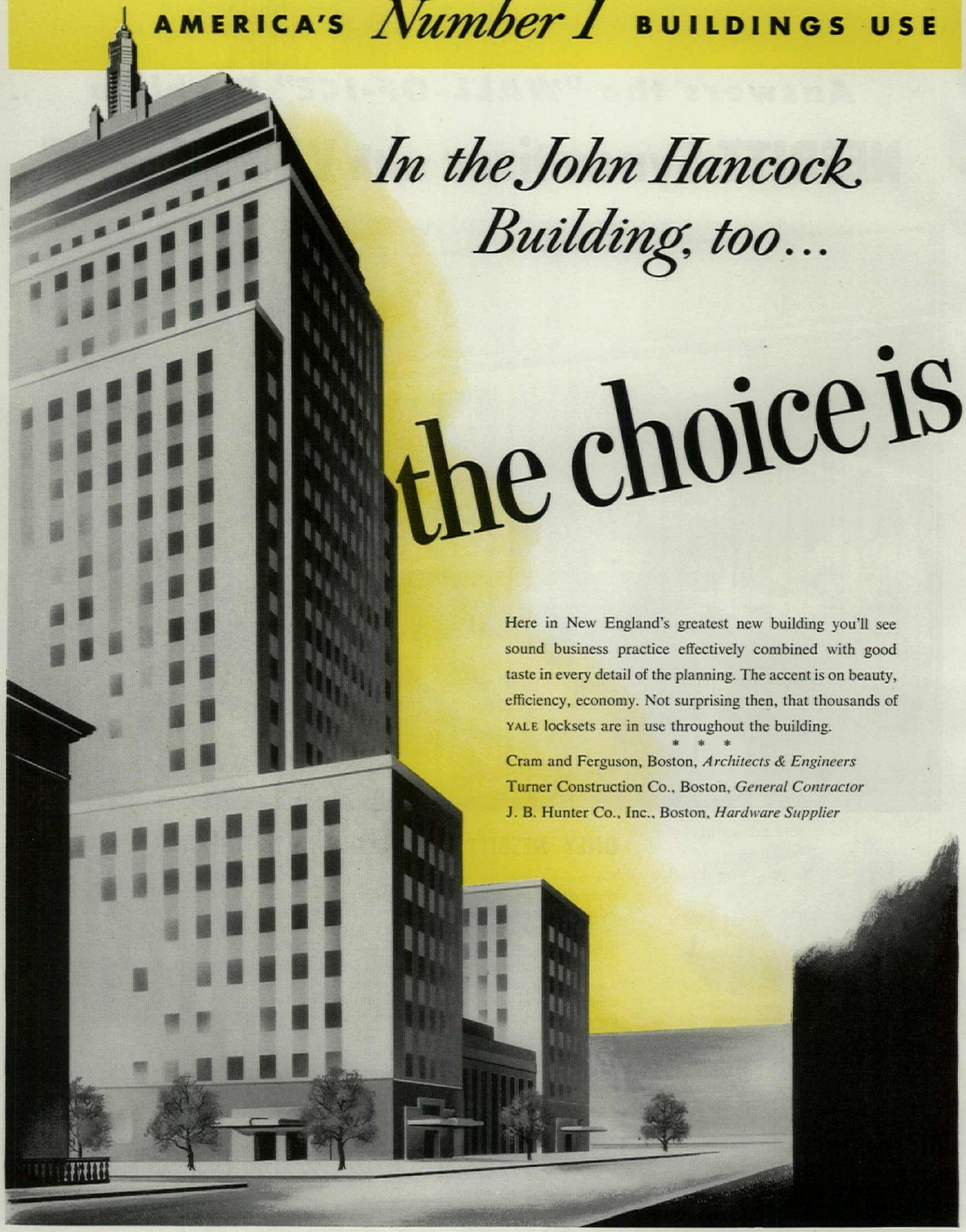

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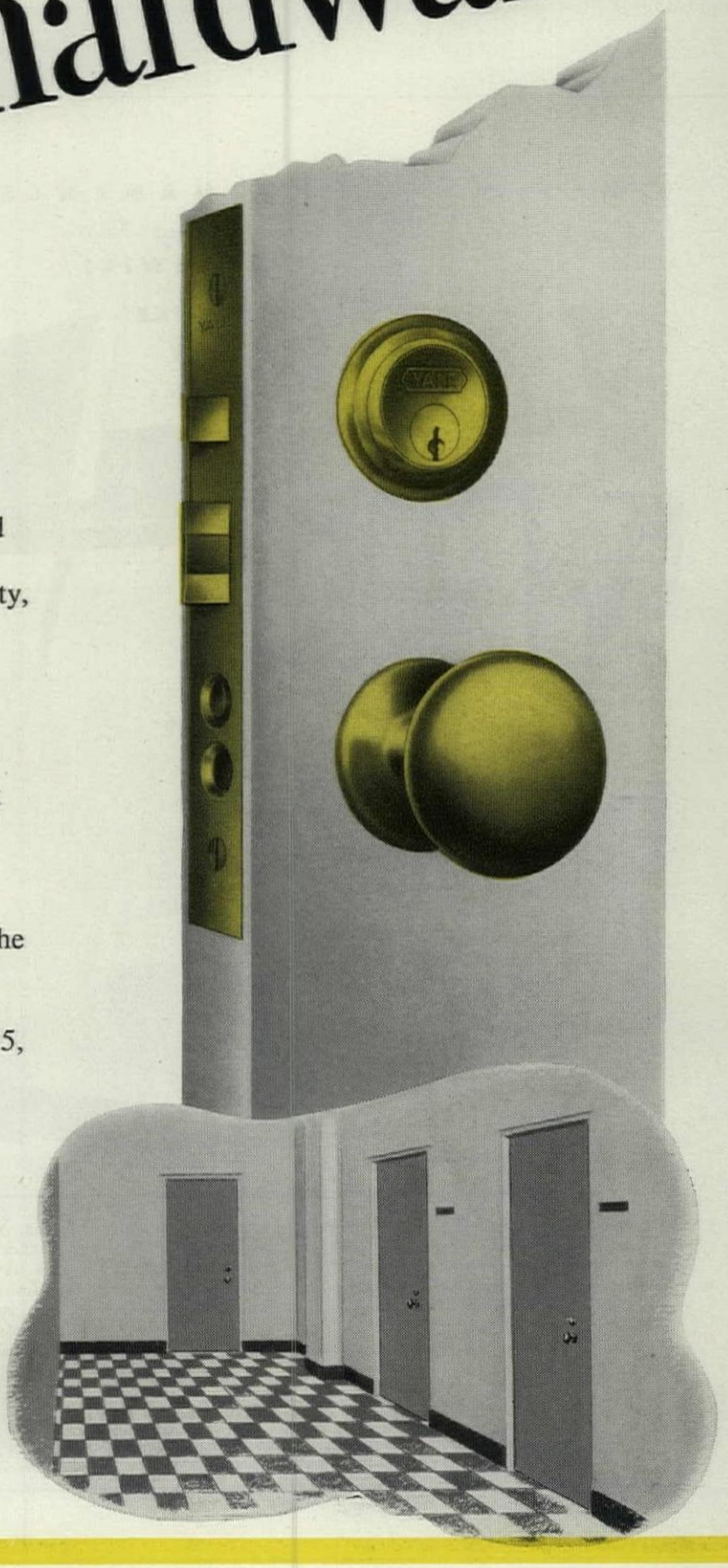
In America's great, new buildings the choice is YALE *hardware. And with good reason!*

No other hardware has so thoroughly demonstrated its ability to save management money—and at the same time maintain the highest standard for security, performance, appearance!

You'll find the proof in case history after case history from buildings of every size and type. YALE hardware cuts replacement and servicing costs to next-to-nothing. YALE hardware is easier to live with—makes doors open easily, close firmly, lock surely. YALE hardware *keeps* its beauty year after year.

Good reasons for *you* to choose YALE, too!

Consider these advantages for the job you have on the board now. We'll be glad to cooperate with you in planning, or to send you detailed information. Just write The Yale & Towne Manufacturing Co., Dept. S-65, Stamford, Conn. (In Canada: St. Catharines, Ontario.)



YALE 8656. Gives excellent security for doors opening inward or outward. Small trigger bolt deadlocks latchbolt. Bronze front and bolts. Key changes practically unlimited, master key systems registered.

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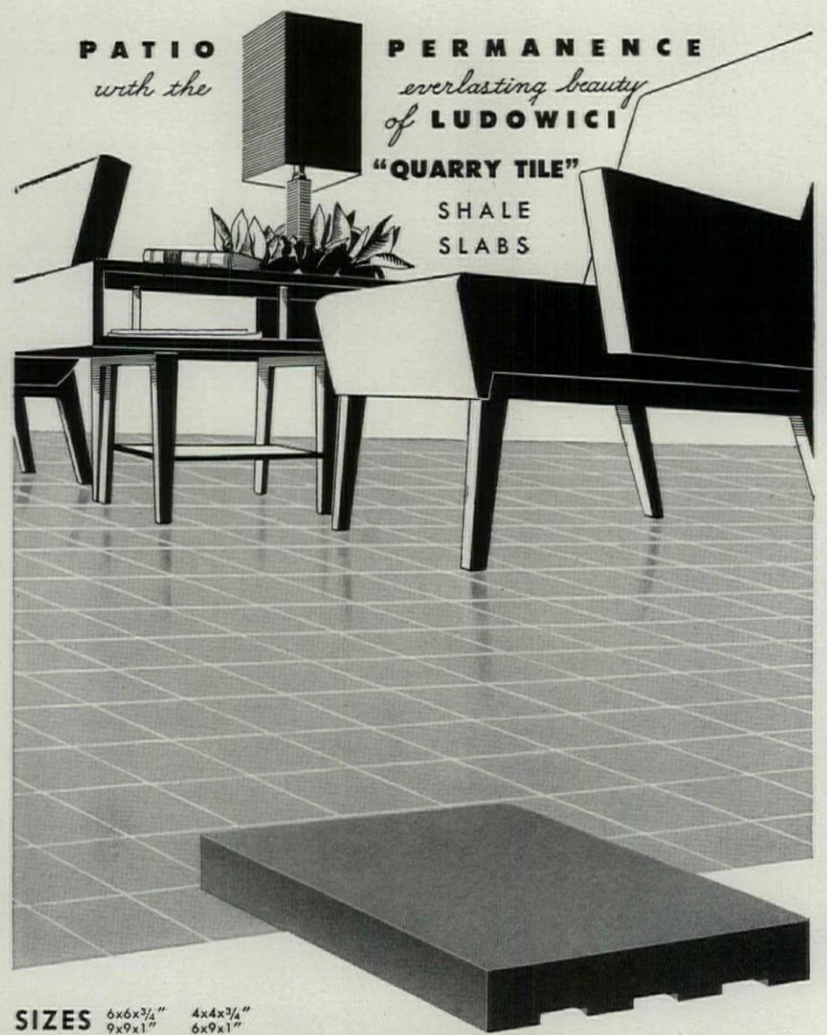
TECHNICAL LITERATURE

LATH AND PLASTER. Certain-Teed Gypsum Lath and Gypsum Plaster. Certain-Teed Products Corp., 120 E. Lancaster Ave., Ardmore, Pa. 36 pp. 8½ x 11".

The new catalogue describes the various gypsum lath products and base and finish coat plasters made by the manufacturer. It contains a reference chart listing many plastering problems and their remedies. Also included are specifications for application of plaster on all types of lath and masonry surfaces, a glossary of plastering terms, and a description of the manufacturing process of gypsum lath and plaster.

ROOFING MAINTENANCE. Solving Roof Problems. The Tremco Mfg. Co., 8701 Kinsman Rd., Cleveland, Ohio. 32 pp. 8½ x 11".

Well illustrated by photographs and drawings, the booklet thoroughly explores various types of roof construction, causes of deterioration, and diagnosis and treatment of roof troubles. The information presented is based on laboratory experiments and field experience of the company's representatives.



●Exposed roof terraces, porch or breezeway floors and patio areas, as well as many sheltered spaces within a building, provide opportunity for the use of Ludowici Shale Tile Slabs. These colorful, "quarry" tiles make a floor of complete permanence, never requiring maintenance, always responding with original sparkle to simple cleaning. Vertical base tile are available for corners and trim. For years Ludowici tiles have been the choice of architects in thousands of installations including the recently laid promenade atop the famous U.N. Secretariat Building. Write for samples. See our catalog in Sweets.

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Cleveland 20, Ohio, 12734 Woodland Ave.

WALL COVERING. Wall-Tex Fabric Wall Coverings. Columbus Coated Fabrics Corp., Columbus 16, Ohio. 6 pp. 9½ x 11¾".

Prepared especially for architects and builders, this neatly bound reference file gives useful application and specification data on Wall-Tex washable wall coverings. Many different types of the fabric backed material are described and sample swatches are mounted on the inside cover. Current patterns reproduced in the literature indicate the wide choice of designs suitable for many kinds of buildings and rooms. Also included is a handy table for figuring yardage required and cost of covering walls and ceilings with Wall-Tex.

AIR CONDITIONING. Westinghouse Precipitron. Booklet No. SA-6691. Westinghouse Electric Corp., Sturtevant Div., 200 Readville St., Hyde Park, Boston 36, Mass. 8½ x 11".

In nontechnical language, the leaflet describes the Precipitron electronic air cleaner and explains the unit's construction and operation. It tells why the Precipitron cleans air efficiently, where it can be used advantageously and how to select a unit for a particular air cleaning job.

AIR CIRCULATION. Fans for 1951 Catalogue No. X6849. The Emerson Electric Mfg. Co., St. Louis 21, Mo. 32 pp. 8½ x 11".

This colorful catalogue gives detailed specifications and performance data on the company's current line of desk and stand fans, air circulators, ceiling fans, and kitchen ventilators, as well as exhaust, attic and window fans.

TRANSFORMERS. Air-Cooled Distribution Transformers. Marcus Transformers Co., Inc., 32-34 Montgomery St., Hillside 5, N. J. 4 pp. 8½ x 11".

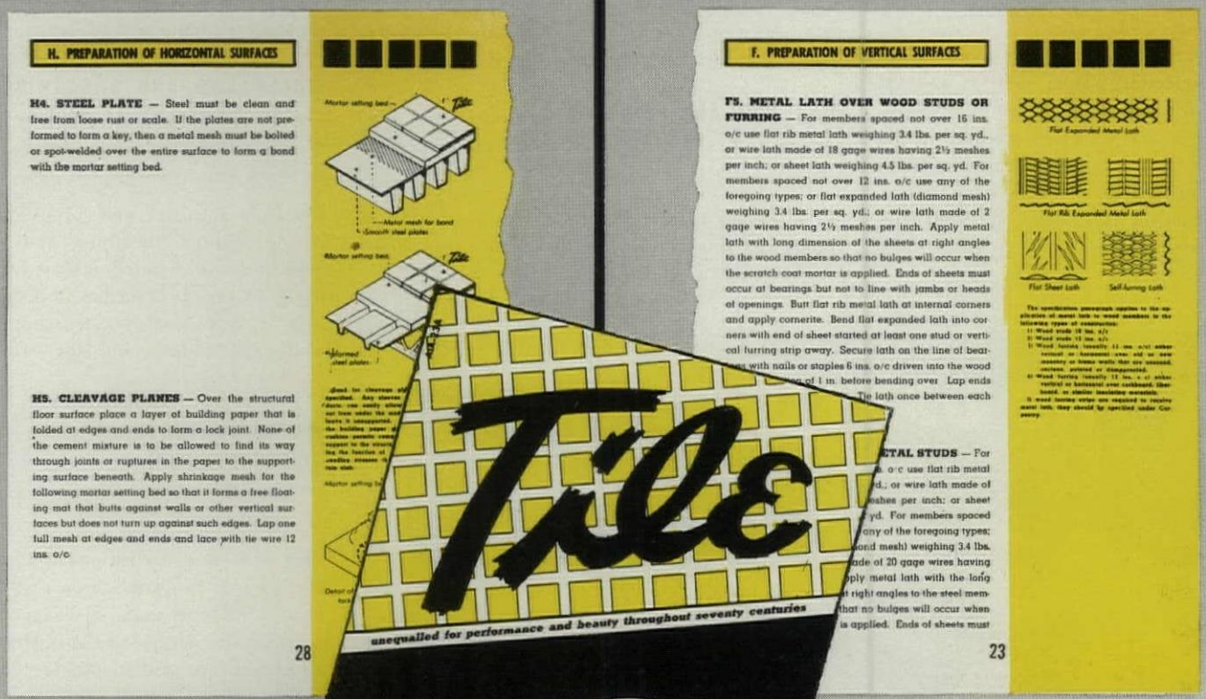
Safety, avoiding explosion and fire hazards, economy of installation and maintenance are points stressed in the bulletin on air cooled distribution transformers. The publication shows a cutaway picture of a transformer, describes various types of air cooled power center units, and gives details on the manufacturer's lighting transformers.

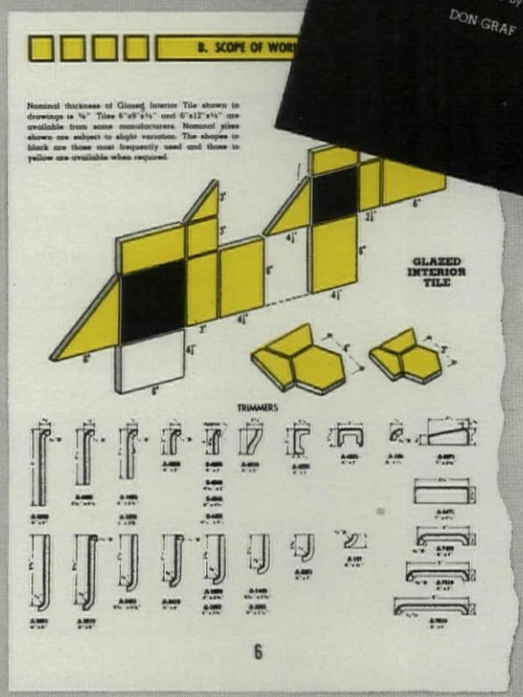
HEATING CONTROLS. Honeywell Automatic Heating Controls. Minneapolis-Honeywell Regulator Co., Minneapolis 8, Minn. 60 pp., 8½ x 11".

The latest issue of this heating controls catalogue contains current price lists, technical data, and comprehensible charts and diagrams. Easy to read, the new issue includes helpful tips on installation. A cross index simplifies finding data on proper controls for specific applications.

(Continued on page 292)

SAMPLE PAGES OF NEW 48 PAGE TILE HANDBOOK





A HANDY GUIDE TO ALL TILE WORK

A USEFUL AID TO SPECIFICATION WRITING

The new 48 page Tile Handbook represents the experience and best judgment of the country's leading manufacturers and installers of Clay Tile.

COMPILED BY DON GRAF

His cross-sectional drawings and diagrams make the task of tile specification an easier one.

The Handbook covers three main areas: (1) The specification itself which takes in contractual and legal considerations, materials, general provisions, etc. (2) related work, including demolition, subflooring and paper, membrane waterproofing, etc. and (3) the Appendix, including glossary of terms, Bureau of Standards SPR 61-44 and construction details.

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Enclosed please find $2.00 for an additional copy of the new Tile Handbook.

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PLUMBING FITTINGS. Zurn Carrier Index. J. A. Zurn Mfg. Co., Erie, Pa. 7 pp. 8½ x 11".

The Index provides architects with a quick accurate way of selecting proper carriers and fittings for use with wall type plumbing fixtures. Simplying the preparation of specifications, this catalogue indentifies the kinds of carriers or fittings made by Zurn which are suitable for various wall type closet bowls, lavartories, sinks, urinals and hospital fixtures produced by American Radiator & Standard Sanitary Corp., Crane Co., Eljer Co. and Kohler Co. All listings are said to have been verified by the fixture manufacturers whose products are indexed.

CAULKING AND POINTING. Mastic Caulking and Pointing. The Tremco Mfg. Co., Cleveland 4, Ohio. 12 pp. 8½ x 11".

This clearly illustrated brochure contains detailed and short specifications for mastic application on masonry construction. The specifications (indexed for easy reference) cover caulking, pointing, bedding and buttering.



WALLBOARD AND SHEATHING. Certain-Teed Gypsum Wallboard and Gypsum Sheathing. Certain-Teed Products Corp., 120 E. Lancaster Ave., Ardmore, Pa. 20 pp. 8½ x 11".

Itemizing the uses and advantages of the company's gypsum sheathing and wallboards this booklet gives detailed instructions for applying the products. It describes in detail the fiber tape joint system used for treating joints between wallboard panels, and the laminated gypsum wallboard system.

WATER HEATERS. Packaged Water Heating, Bulletin SM-41. O'Brien Steam Specialty Co., Inc., 331 Heffernan Building, Syracuse 2, N. Y. 4 pp. 8½ x 11".

This bulletin gives ratings and specifications for five sizes of the firm's bronze steam-mixer water heaters. These units, packaged complete with controls and accessories, mix steam directly with water and are said to provide hot water instantaneously at controlled temperature. Also described is a unit which supplies hot water at two or more controlled temperatures for industrial washrooms and processing, and a mixer for small capacity hot water service.

HEATING. Dravo Counterflo Direct-Fired Warm Air Heaters, Bulleting 526. Dravo Corp., Heating Dept., Fifth and Liberty Ave., Pittsburgh 22, Pa. 8 pp. 8½ x 11".

Described and pictured in this bulletin are direct fired space heaters in a range of gas or oil field models with outputs from 400,000 to 2,000,000 Btu per hr. A comparison chart shows that steel requirements for installing these heaters is substantially less than those for other commonly used systems. In many cases, the booklet points out, steel needs for heating systems can be cut 50 to 70% through the use of direct-fired warm air heaters.

CABINET SHOWERS. Weisway Catalogue of Cabinet Showers. Henry Weis Mfg. Co., Inc., Elkhart, Ind. 24 pp. 8½ x 11".

Construction drawings of cabinet showers in this publication have been planned so that architects can transcribe them directly from the catalogue page. Practical design features described include the "baby," "growing children," and "less active" showers. Each of these models contains an additional set of handles and head mounted at a low level. In addition to white, Weisway metal cabinets are now available in five colors selected to match those popular in bathroom fixtures on the market. Chips of the new tones are tabbed into the catalogue. Also presented are floor plans which suggest ways to plan additional bath space in new and existing construction.

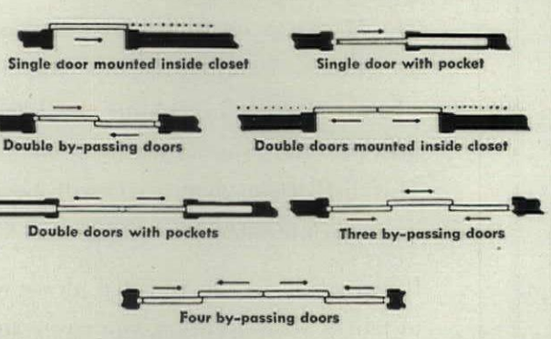
(Continued on page 296)

Space-Saving Idea that Sells Homes

STANLEY SLIDING DOOR HARDWARE



A type of Stanley Hardware for all these installations — and more



You can give clients what they want *most* — living space — with Stanley Sliding Door Hardware. Women, particularly, are intrigued with interior doors that slide in and out of walls. Silent-acting and smart-looking, as well as space-saving, they make your selling job easier.

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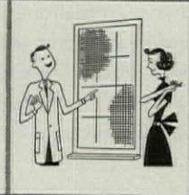

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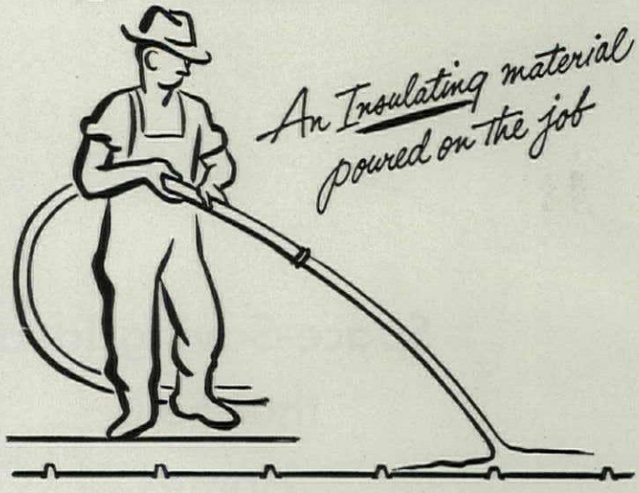
DURALL Tension Screens are made by one of the oldest manufacturers of wire screening. For complete information, write the New York Wire Cloth Co., Dept. AF-5, 445 Park Avenue, New York 22, New York.

PORETHERM



Poretherm is a high grade, permanent, fireproof, rigid, insulating, cellular concrete weighing 30 lbs. per cu. ft. Made of Portland cement it is excellent for roof and floor insulation. Poured in place 20 to 60 ft. high through a 2" hose with the mixing equipment on the ground floor it dries rapidly and forms a fireproof rigid blanket. Recommended for large areas only.

Write for complete information.

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New York 20, New York



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***Beautifies* AS IT PROTECTS**

STANDARDIZATION. Federal Specification Colors for Ready Mixed Paints. Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C. 36 pp. 11½ x 9½". $4.50.

One hundred million dollars' worth of paint may sound like enough to give the earth several coats but it is only the amount Uncle Sam spreads around *each year* to keep little things like post offices, penetentiaries and pentagons bright and shiny. With an economic eye toward simplifying purchases and eliminating the down-draining of countless leftover gallons of cerise, blue sunset, etc., the government studied the national paint picture for 20 years and recently came up with a workable intelligible standardization scheme. Through the research of a Federal Specifications Board committee (the Technical Committee on Paint, Varnish, Lacquer and Related Materials) numerous overlappings were found in the paint colors used most often by government departments and the armed services. By consolidating tones which varied slightly throughout the country, the committee boiled the lush and expensive palette down to 60 gloss, 28 semigloss and 81 lusterless colors. Instead of naming the colors after states or fish as the government is wont to do with its battleships and submarines, the various shades were categorized according to a simple and comprehensible number system.

To reproduce the selected colors accurately in book form the unique McCorquodale process was utilized. Unlike other paint tab methods, this printing technique does not involve separate preparation of specimen chips, die-cutting and pasting. Instead, automatic machines deposit thick films of matched pigment in liquid form directly and permanently on the paper. The pages are contained in a loose leaf folder so that additional plates may be inserted whenever necessary and soiled ones replaced.

The most colorful standardization work to date, the new *Federal Specification-Colors* book should assist the paint industry in making bids, and contractors working on government buildings as well as permit various government departments to exchange surplus supplies. Actually, the latter advantage is a glorification of what apartment house landlords have been practicing for years with their standard repertories of cream, gray and light green.

ROOF DRAINAGE. Roof Drainage Equipment. Wade Mfg. Co., Elgin, Ill. 6 pp. 8½ x 11".

This folder provides architectural specifications for the company's roof drains and describes procedure for various types of roof decks. A large rainfall map of the United States and a chart make it easy to determine the number of drains needed for a roof in any part of the country.

FASTENERS. Hassall Catalogue No. 60. John Hassall, Inc., Clay & Oakland St., Brooklyn 22, N. Y. 24 pp. 8½ x 11".

Boasting an attractive format by industrial designer Charles S. Dean, this catalogue illustrates a variety of nails, rivets and other specialties made by Hassall. While of primary use to manufacturers, the book does contain items of general interest to builders on nailing techniques and choice of fasteners.

PAINT. Merkin Paints. M. J. Merkin Paint Co., Inc., 1441 Broadway, New York 18, N. Y. 30 pp. 8½ x 11".

Each of the more than 150 paint and finish products made by the Merkin Co. is described concisely in this catalogue. Information is given on how the coatings should be used, their spreading rate, and surfaces over which they can be applied. An acetate covered inset contains 139 color chips in a variety of finishes, and a "Where and What to Use" chart describes the finishes recommended for interior and exterior surfaces of wood, masonry, brick, metal, wall board, cloth, tin roof, paper and machinery. For easy handling, the book has a hard cover bound with a plastic spiral.

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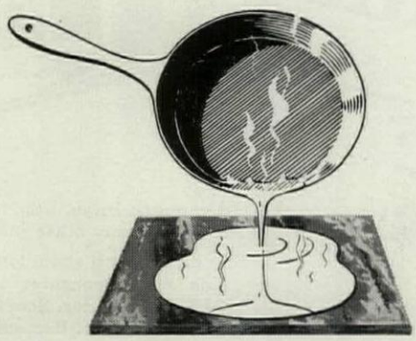
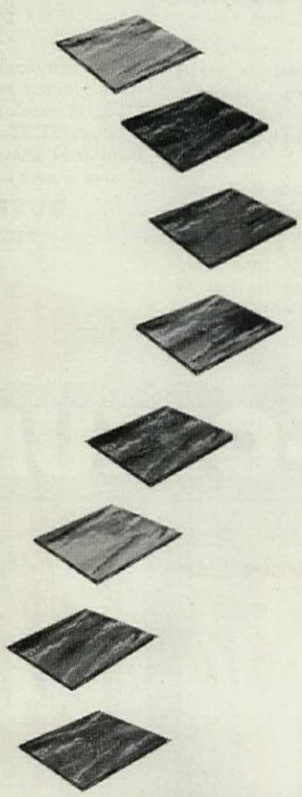
gives floor beauty that's there to stay!



When you install floors of tough, grease-resistant, premium-quality AZPHLEX Asphalt Tile, you can look forward to many years of floor beauty—for the fine colors of AZPHLEX can never fade or wear away. AZPHLEX quality, like its color and its resistance to grease, fats, oils, alkalis, mild acids and alcohol, is through-and-through . . . the result of years of research to give you a premium-quality floor. Compare this remarkable tile with any other resilient floor covering. You'll be amazed at its superiority—and at its moderate price, too!



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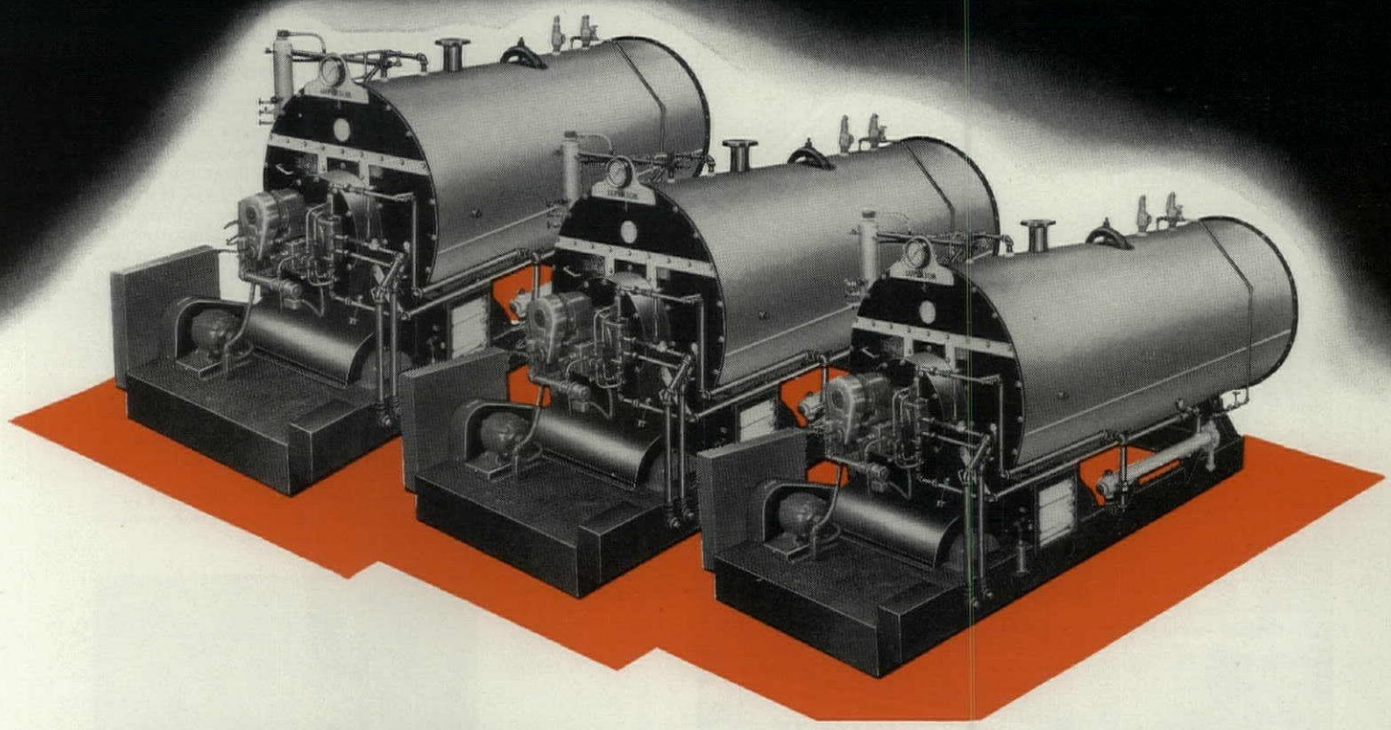

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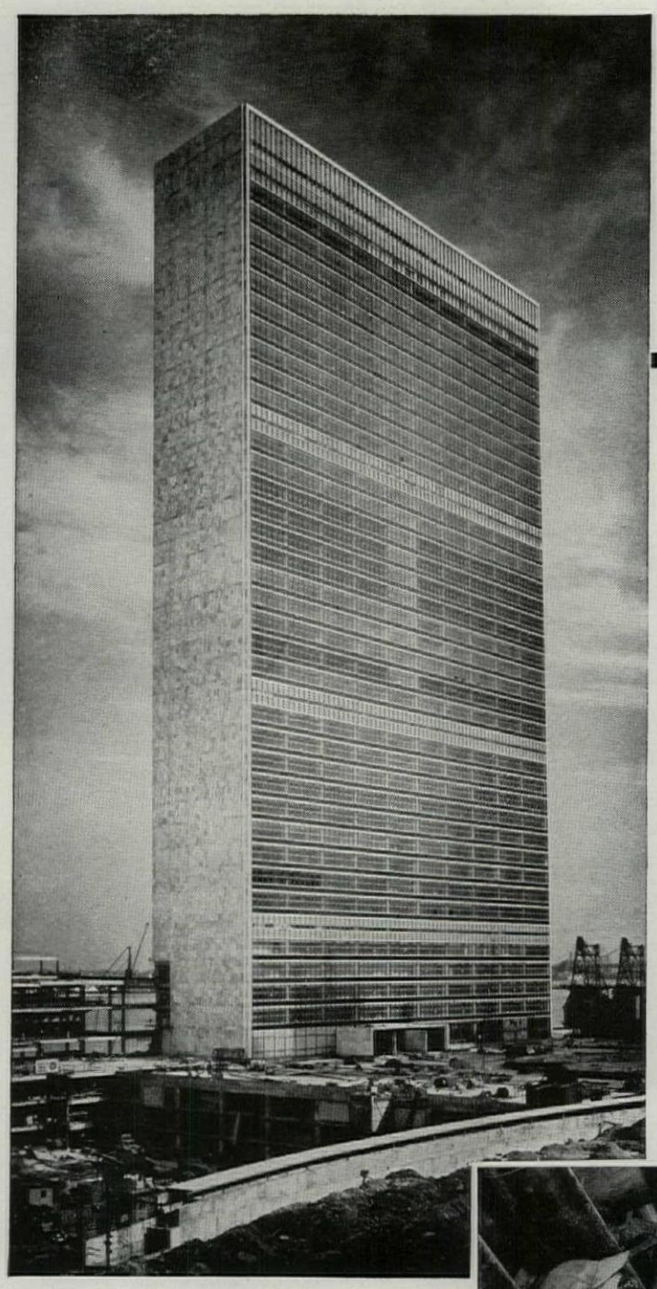

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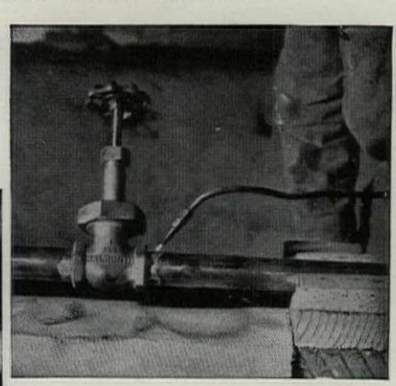
Making a Silbraz joint with a Walseal Gate Valve at UN, work being done at bench.





Installing a Walseal fitting at UN, on location; note operator progressively heats small section of the fitting.

Cut-away view of a Walseal Tee, showing sectional view of Silbraz joint; factory inserted ring of silver brazing alloy; and completed Silbraz joint.



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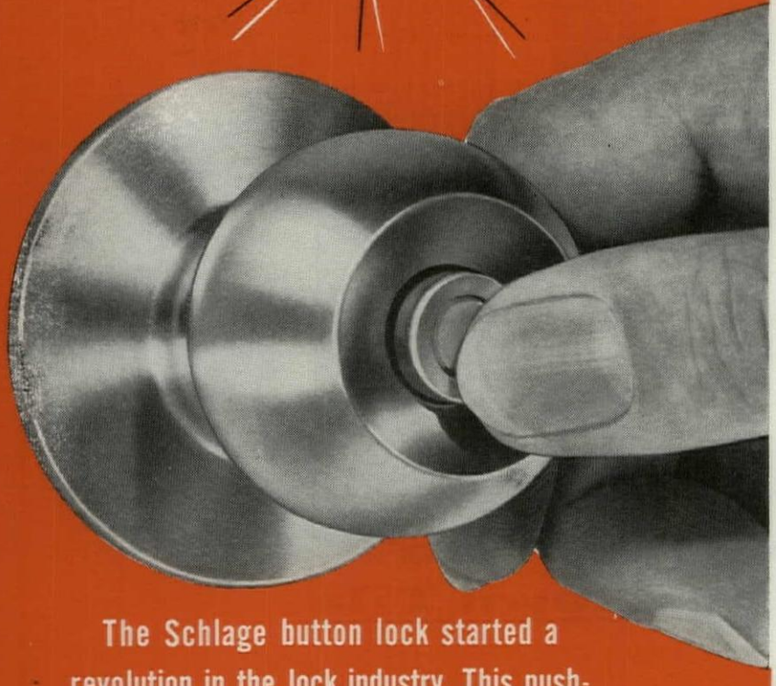

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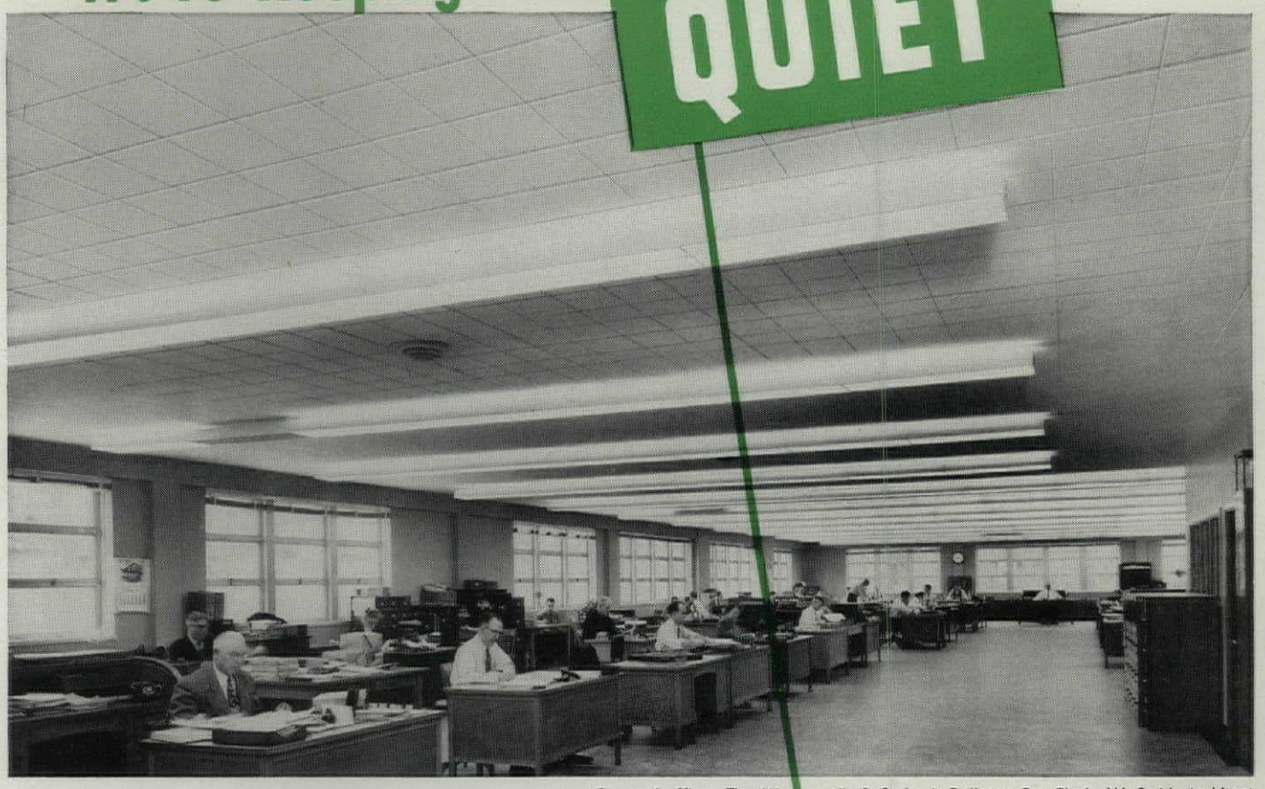

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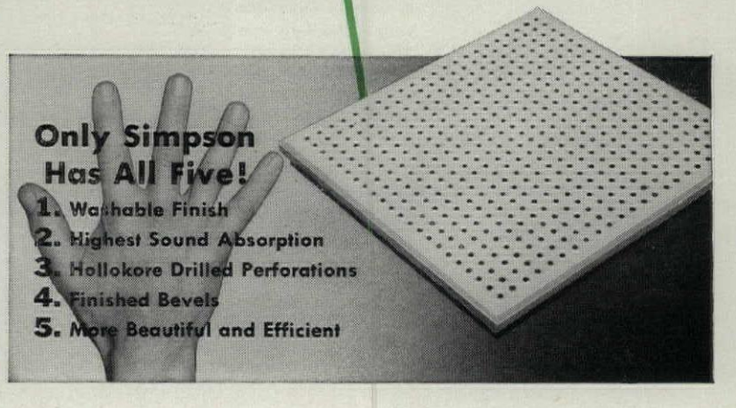

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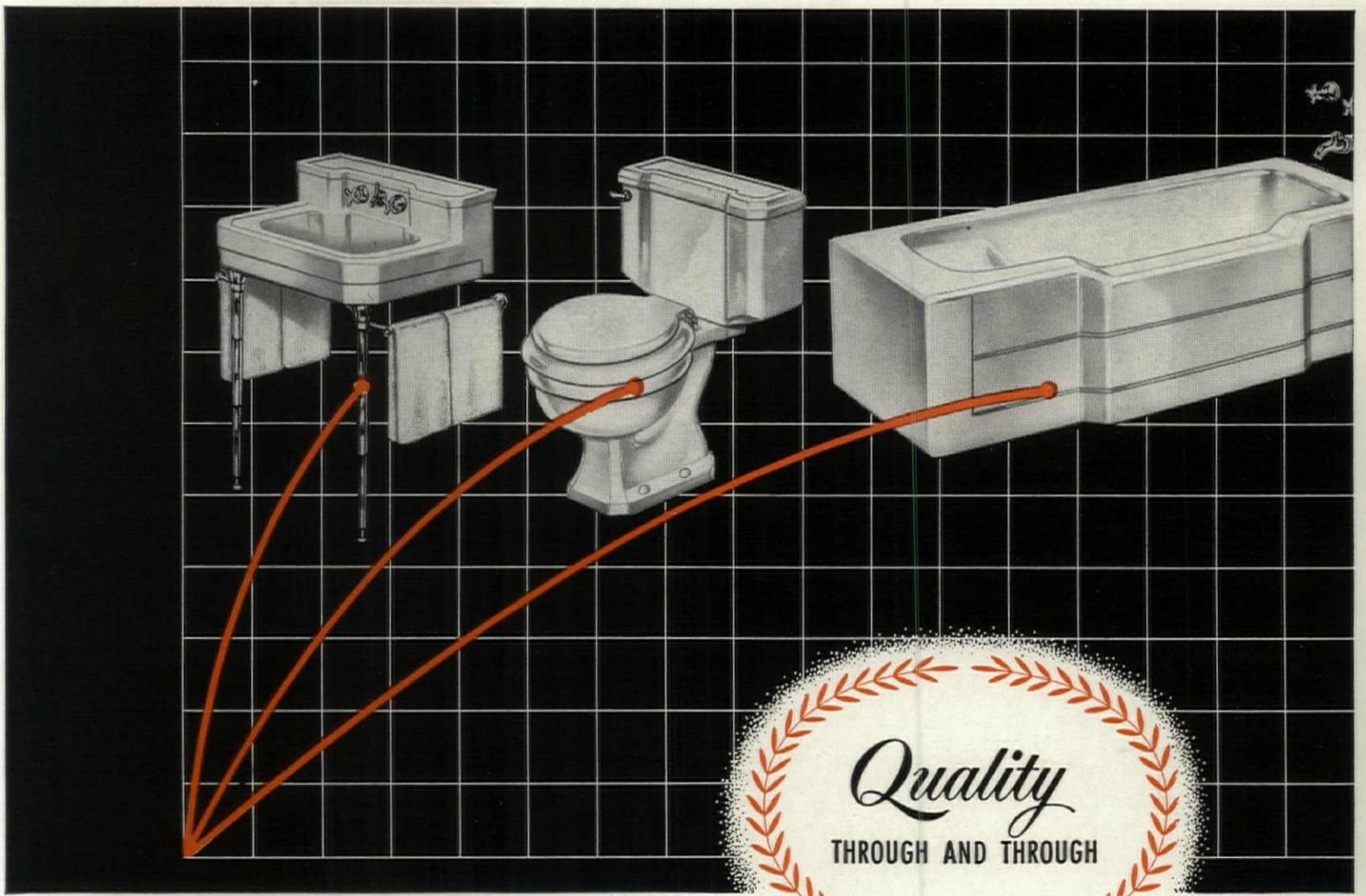

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