A charming detail of the All-Copper House erected at Washington, D. C., sponsored by Chase Brass & Copper Co., built by Copper Houses, Inc., designed by John J. Whalen.

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American Builder, March 1936.
KEEP THE GOVERNMENT OUT OF HOME BUILDING

Two widely differing policies for increasing expenditures on housing are being advocated by persons high in the government at Washington. One is the policy represented by the National Housing Act—that of encouraging and stimulating investment of private capital by private individuals and companies. The other is that of investment and use by the government of hundreds of millions of dollars of the taxpayers' money in so-called "low-cost housing" in ways that will afford a subsidy to those occupying the houses and apartments built.

The American Builder has done more than any other publication to promote the passage and successful administration of the National Housing Act. The large increase that has occurred within the last year, and is still occurring, in expenditures upon modernization and construction of homes demonstrates that this is the soundest and most effective measure for promoting economic recovery that has been passed since the depression began.

Its results present a striking contrast to those of other measures for huge government expenditures upon public works to "prime the pump" of business—measures which, while failing to "prime the pump," have caused an enormous increase in the national debt.

There is nothing more dangerous to the public welfare than a policy of huge government spending to promote recovery or for any other purpose. There is nothing more dangerous to an industry than to have the government enter it with a policy of government construction and subsidies. Never has this been so conclusively demonstrated as in the United States within recent years.

The home-building industry and the American people should not be misled by the apparent, but unreal, temporary advantages they would derive from having the government provide a large amount of "low-cost," subsidized housing. It would necessarily provide it, including the subsidies, with the taxpayers' money. The more of the taxpayers' money the government spends, the less of their money the taxpayers themselves will be able to spend. The more extensively the government invades the field of home building, the greater will be the amount of private capital it will prevent from being invested in that field.

Consider what is occurring in the public utility industry. Private companies in that industry desire to invest hundreds of millions of dollars in enlarging their facilities, but month after month are prevented from doing so by the government's invasion of their field and its threatened more extensive invasion of it—with the taxpayers' money.

Home building is rapidly recovering from the depths to which it declined. The American Builder has a greater selfish interest in continuance of its recovery than any other publication in the United States, and would favor any sound policy that would stimulate it. Our selfish interest, however, is identical with that of every building contractor, of every manufacturer of or dealer in building materials, and of every employee of them; and their interest is identical with that of the entire American people.

The interest of all is to have the greatest practicable increase of the volume of building construction. This can be attained only by a vast increase of private investment; and the more the government invades the field the smaller will be the increase of private investment.

Samuel O. Drum
Chairman
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UNIVERSAL ATLAS CEMENT
KEEP THE COSTS DOWN

THE building industry should stop, look, and listen—and then give still more serious thought to the damages and dangers of high costs.

A healthy and encouraging pickup in business is getting under way. There is one sure way to smother this building improvement, and that is to boost prices and building costs.

It is perfectly natural for manufacturers, dealers, contractors, and financial institutions to want to increase their incomes. But if all of them unite at the same time to increase building costs, they will kill any chance for profits. There is an alarming amount of talk about increases in material costs. Labor threatens to demand large increases “just as soon as business picks up a little.” Financial institutions, in spite of the universal talk about how easy it is to get a loan, are once again attempting to collect charges and commissions that are excessive.

WHAT the building industry—and particularly the home building industry—needs today is a good, low-cost house. The demand for low-priced homes that the average man can afford to buy is so great that something must or will be done about it. It is one of the reasons why the federal government talks of “doing something” for the housing field. It is the sole reason why the talk about pre-fabricated houses and “factory-built” houses attracts so much attention. President Roosevelt himself is reported as having said recently that what the country needs more than anything else (even than a good five-cent cigar) is a good twenty-five hundred dollar house.

The American Builder believes that the building industry, as now organized, can produce a satisfactory twenty-five hundred dollar house. In the small towns and rural areas, where land and labor costs are low, such houses are being built. But in these very areas, FHA or other long-term financing is most difficult. The government can help by making loans on low-cost, semi-rural houses more easy to obtain. The leading article in this issue describes the building of six-room, extraordinarily well-equipped houses on Long Island which sell for $4990 each. Here is low-cost housing which is within the reach of the working man in New York. Home costs in this project are kept down, but if labor, material and financing costs advance even these smart operators will be unable to produce such houses at less than five thousand dollars.

STUDY of the history of building booms and depressions shows clearly that good business follows a period of low prices; that as soon as the prices and building costs go up, volume falls off. This was true in 1920, when there was a tremendous housing need but high prices delayed construction for several years. It was true again in 1928 and 1929, when sky-rocketing prices put a damper on activity and eventually brought on not only a building decline but a general depression. It will be true again in 1936 and 1937, if building prices are allowed to go any higher.

There is no doubt that a great need for homes exists today. Every index shows it. There will undoubtedly be a healthy building increase. But as Roy W. Wenzlick, real estate economist, pointed out in his recent address to the Northeastern Lumber Dealers' Convention, high prices may very well delay any extensive revival for possibly several years. Many sound economists declare that the cost of a house today is far out of line with other costs and with the ability of the average person to pay.

American Builder believes events of the past few years have shown the dangers of high prices. The abrupt rise due to NRA killed a small revival at that time. The lower prices since NRA have stimulated construction. Today there are splendid opportunities for reasonable earnings for manufacturers, dealers, builders, and workers in this field. But in the long run the highest income will be earned by a small return on a greatly-increased number of jobs, rather than a high return on a few jobs.

Labor, materials, land, and overhead costs on houses are today at reasonable levels. They could be a lot lower. There has been a rise from the extreme lows of the depression. If homebuilding, under the present system, is to be encouraged, costs should not be greatly increased over their present levels.

In the boom days the greatest single "loading"
charge was in connection with the financing of homes. The advent of FHA was supposed to have eliminated high financing costs; but it has not. Evidence is already apparent that many of the old evils of excessive charges and fees in connection with building loans are recurring. Builders should be on the alert to protect their customers against these charges.

It is true that some of the worst abuses are not yet extensively recurring, but excessive fees for appraisals, legal advice, title searches, and service charges of one kind and another, are common. In the New York area loaning institutions will attempt to charge an individual seeking an eight thousand dollar loan anywhere from three hundred to five hundred dollars. After all the platitudeous things that have been said about the low cost of home financing today, this charge comes as a great shock to the prospective home owner. The various building and loan, mortgage, banking and insurance institutions each has its own schedule of rates and charges, and there is such variation that the prospective home owner feels the whole business is a racket. The following costs and charges in connection with an eight thousand dollar loan are being asked in the New York area:

| Commission | $80 to $160 |
| Title Search and Insurance | $75 to $10 |
| Mortgage tax | $40 |
| Recording fee | $10 |
| Survey | $35 |
| Appraisal fee | $15 |
| Inspection fee | $10 |
| Legal fees | $50 to $100 |

Is there any wonder that a home owner who has been scratching and scraping to make every dollar count in his new house is frightened and discouraged when he is confronted with such costs as these? The question may well be asked, Are the financing institutions in this business to make a legitimate income loaning money at an adequate interest rate (5½ to 6 per cent is certainly a good return in these times), or are they in the business to squeeze every cent they can out of little side rackets on legal fees and title investigations?

The solution to this problem of high costs of all kinds in connection with home building is in the hands of the residential contractor. He alone can protect the prospective home-owner against excessive financing charges or excessive labor and material costs. The smart, intelligent, and well-informed builder can get the costs down and keep them down. If he will do this his business will increase in volume and he himself will benefit along with the home owners whose interests he determines to protect.

Genuine Low Cost Housing

WASHINGTON news of late has had to do with clashes between the social planners as to who will pay the difference between what "housing" can be erected for and what slum-cleared renters can afford to pay. It seems that the lowest cost achieved to date on government housing projects requires for eventual amortization a monthly rental of $8.00 per room. Reporting a meeting of "President Roosevelt's housing advisors" the Associated Press of Feb. 14 states,

"Some experts said that it might be necessary to rent the homes for $5.00 a room that cost $8.00 to build. Therefore, they contended, it would fall upon the federal and local governments to put up the difference, the question being the share each should bear."

In wholesome contrast to this we read in the Chicago Daily News of Saturday, Feb. 22, the cheering account of private home building and home buying by low income families of sturdy little five and six room homes in one of that city's suburbs, each on a tract of fertile, garden land, 132 feet by 178 feet, and all at a cost of from $2500 to $4000 complete. These privately built and privately financed homes, it is stated, can be purchased on terms as low as $5.00 per room per month will buy them, paying all costs and carrying charges.

Here is genuine low cost housing that will appeal to 80 per cent of the population, and that can be promoted without regimentation or subsidies. The U. S. Building and Loan League released a statement on Feb. 23 directly in line with the American Builder's attitude on this subject of low cost housing, showing how widespread is the appeal of the small private home.

"We agree with the emphasis which many thinkers are placing upon the smaller, less pretentious dwelling unit as the keystone of the much needed home building revival," says the League directors' statement. "With our long experience in the building and loan field many a man with an average family has been able to own a $2500 house on a salary of $1000 to $1200 a year, paying for it by installments. After all, sixty per cent of the people of this country live in towns of less than 25,000 in most of which a $1000 to $1200 a year income is adequate for plain, self sufficient living for a medium sized family, and in which thousands of families, with the aid of building and loan associations, have been able to buy nice homes on incomes of around $1100 a year."

Privately financed home building is making a big increase this spring, putting thousands of men back to work and adding billions to the nation's wealth. This is wholesome, widespread business; it wants neither government subsidy nor government competition.
ELECTRIC JOIST BORING FOR PIPES

POWER HAND TOOLS
SPEED PRODUCTION

Lowered Costs and Improved Efficiency Reward Builders Who Keep Equipment Up-to-Date
IN THE first article on this subject in last month's American Builder the advantage of advance planning was pointed out. The speed and efficiency of the electric power saw is greatly increased and costs greatly reduced by planning every cut to be made and having this cut done right at the lumber pile.

The next step is to provide a proper working area; but before getting into that let us consider for a moment the problem of running in the electric power.

Since the power saw is needed right from the very beginning, arrangements should be made as soon as possible. Experience has shown that the cheapest arrangement is to run in a temporary line from the nearest neighbor. Since most electric saws operate from any light socket, it is a simple matter to run a wire from the neighbor's basement, porch light or garage to the saw bench.

It is suggested that a good arrangement is to offer to pay the family's electric light bill during the month the saw is in operation. The average electric bill is very small, and the cost of this arrangement would not be excessive. As soon as the house is far enough along, a permanent meter can be installed.

The importance of a substantial, well designed saw bench is considerable. In our article last month we mentioned the "multiple cutting" of joists, rafters, etc. This system of cutting requires the laying out, measuring and piling one on top of another of pieces of lumber. This requires a solid, level and large work area. Every workman knows that a well designed and convenient work bench greatly speeds up work because everything is handy.

In the accompanying sketch a good practical type of saw bench is illustrated. Good stout planks are used and are supported on wide, substantial horses. Notice that a straight 2 by 4 is nailed along the side for use as a side stop, and behind this are placed several higher pieces near each end to help in lining up a pile of joists or boards when cutting several to one length. A square,
substantial bench stop made from a plank is nailed at the end of the bench.

With a good bench like this you are well set to handle the entire job in an economical and speedy fashion.

In building forms for concrete work, two general methods are followed. One is to build the form right in the trench, and the other is to build the form on a bench and then slide it into place in the trench.

**Forms for Concrete**

Under the first method sawing boards by hand is very difficult as the workman is in an awkward position in close quarters with the mud and dirt of the bank interfering. Using an electric saw the work can be greatly speeded up by the man in the hole calling up his measurements to the operator on the bank. The boards are handed to him squared to proper length faster than he can nail them in place. If the man on the bank were using a hand saw, the delay to the nailer would be so great as to make this scheme impractical.

Building forms in this fashion is greatly speeded up by the electric saw because the boards for a whole section of form can be cut at one time. These boards will have absolutely square ends, and this is an important matter in concrete work as it eliminates the fins and projections that mar the job.

Under the second method of form building, most of the construction is done on the bench. When this method is used, the boarding is allowed to project over the ends of the panel, and then cut off with a single quick sweep of the electric saw. Here again an even, straight edge is achieved and a time-saving of considerable importance.

In addition to the above, the electric saw is of great value in cutting up small pieces for spreaders, braces, stoppers, etc. It is possible to use waste material without running up the cost of the operator's time.

The contractor interested in lowering his building costs should study some of the methods widely publicized by makers of prefabricated houses. The principle is to reduce construction to as few simple operations as possible. As was pointed out in article I in this series, in the February American Builder, the experienced builder can figure out in advance the number of joists, rafters and other pieces required and can cut these all at one time at the lumber pile with an electric saw at a great saving. This calls for an exact knowledge of what goes into the house and how it can be done. Many builders would do a better job, and a cheaper job, if they spent more time in advance planning of this sort.

**Multiple Cutting of Joists**

One method of saving time and money is in the multiple cutting of joists. The joists are piled one on top of the other on the saw bench with each one firmly up against the bench stop at the end. Quite a number may be piled up this way, taking care to see that they are piled evenly and square. Then the power saw is set just a little deeper than the actual thickness of the joist, so that when the first cut is made it will leave a mark on the joist below. The first joist is cut and quickly carried away. Then the one below has been marked and may be cut accurately and squarely without any lost of time.

Notching the ends of joists may be done quickly in batches. The joists are set side by side on edge and against the bench stop, and are held together by a strip tacked across the top. The saw is set exactly to the depth of the notch and a cut is made across the whole (Continued to page 128)
EVEN that august institution, the New York Times, which rigorously passes on the literal truth of all advertising, permits the Gross-Morton Corporation of Long Island to call themselves "the largest builders in the United States." They have sold more than 4,000 houses in the past 15 years. They expect to sell more than 500 in 1936.

The present Gross-Morton project is Bayside Hills, Long Island, which was formally opened last October. This former golf course of 116 acres will accommodate 1,000 homes, of which more than 200 have been built or are now under construction. In Bayside Hills Gross-Morton are today selling six-room, two-story houses that are extraordinarily well equipped, located on a 40 by 100 foot plot with all improvements in, at a price of $4,990. They give an alternate choice of a five-room bungalow with studio living room and a large usable attic for the same price. Both types are shown on pages 51 to 55.

The question home builders everywhere will ask is, "How do they do it! How do they get the cost down?" As I sat in the office of Alfred Gross, vice president, in what used to be the old Bayside Hills Golf Club, discussing this point, we were interrupted by an American Builder reader from Akron, Ohio, who had come through one of the worst storms in history to see for himself whether such houses could be built at such a price. Alfred Gross' answer to this question is, "First set your price and profit—then build as much as you can for that much money." He claims that the mistake most builders make is to build a house first and set the price later. Right now, the biggest and most profitable home demand on Long Island is for the $5,000 house. That is what they are giving. A few years ago they sold houses for $4,000. Back in 1921 the price was $7,750—and the house of that day was not as well equipped or built as the $5,000 house of today.

How to Keep Costs Down

Obviously, the full answer to Gross-Morton's low costs cannot be told, but there are many operative methods which other builders may well consider, of which the first and most important is the elimination of overhead. Every conceivable building operation that can be sublet is sublet by Gross-Morton. They have practically no overhead expenses. Each of the three members of the firm, George M. Gross, president; Alfred Gross, vice president in charge of sales, and Lawrence Morton vice president in charge of construction, has a particular field. In addition to these three men the entire field staff of the five-million-dollar Bayside Hills development consists of two construction superintendents and an office girl. There are no company expense accounts,
no sales managers, drafting departments, warehouse men, truck drivers, or any other employees that make for overhead.

In 15 years of experience the firm has perfected a technique of breaking down the operations of the building of a house into the most efficient subcontracts, which are done by firms with long experience and low costs. The work is let out on a piece basis at so much per house, and each subcontractor is himself foreman of the job. The foreman is solely responsible for getting the most out of his men and materials, and it is to his loss if he does not.

At the end of each week the subcontractor receives a check in full for the materials and work installed that week. Because they always get their money they do not have to figure extra for this contingency. Gross-Morton select all materials and equipment themselves and handle the negotiations with the producers. They make the fullest use of their mass purchasing power which runs into tremendous orders. The actual purchase of the materials is done by the subcontractor. In many instances Gross-Morton write their check for the bill, which is endorsed by the subcontractors and turned over to the supply house.

The advantage, according to Alfred Gross, of having the subcontractor actually the owner of the materials is...
that he thereby becomes solely responsible for them and will make strenuous efforts to prevent loss of time or waste of material. Under any other system, he says, there is a large wastage of brick, lumber, trim and other materials. Under this system, he declares, there is not more than a "bushel basketful" of waste on a job.

The subcontracts let on the Gross-Morton jobs consist of carpentry, concrete masonry, painting, plumbing and heating, electric, plastering, brick work, roofing. Long experience and constant repetition of the same job enables the subcontractors to get their jobs organized on a mass production basis that permits extraordinarily low costs. The long experience, plus knowledge of labor and material prices, enables Gross-Morton to estimate the cost of various operations very closely.

More About Costs

The average builder can learn much about costs by studying the designs and plans used by Gross-Morton. These plans are drawn by Architect Arthur E. Allen of Jamaica, Long Island, who has worked with the company for many years in creating the designs that have sold by the thousand. In response to the question, "How can you tell good house plans?" Alfred Gross said, "After you have sold 1,000 houses and the plans still work, you can be pretty sure they are good!"

Alfred Gross declares that although exterior styles change, the essential requirements of a family change very little. The Gross-Morton designs are planned for livability and economy. Every detail of the framing and of the exterior is adopted on the basis of effectiveness at the lowest cost. Before any exterior detail is adopted it is checked and rechecked for economy of construction. They insist on simple methods and eliminate all costly operations.

American Builder, March 1936.

From Inside Out

When prospects go into Bayside Hills houses, they are impressed by the spaciousness, good light and air, and the efficient arrangement. This is because the houses are planned from the inside out, according to Gross-Morton. They figure the plan so that the living room has southern exposure. When the same plan is used on the opposite side of the street, it is reversed.

Of course the two spots in the house that attract the most attention are the kitchen and the bathroom. Builders from other parts of the country can hardly believe that such kitchens and baths are possible in a $4,990 house. The answer is: few other builders are engaged in a 1,000 home program.

Selling Methods

Bayside Hills houses are sold by a corps of seven salesmen who operate on a commission basis. While Gross-Morton did not divulge the commissions they pay, the common practice is $50.00 a house on Long Island. Many of these men have been with the company for years, and they are experts.

Skillful advertising and publicity have made Bayside Hills the most talked of home building project in America. All the advertising, publicity and newspaper work are in the hands of Peter J. McKenna, who has specialized in real estate advertising for over fifteen years. Other builders might well consider turning over their advertising and publicity to an experienced man or agency on a fee basis if they are interested in getting maximum public attention.

Financing Methods

Gross-Morton make much of the fact that their houses are financed under the Federal Housing Administration's plan. They consider FHA supervision a big asset. On both the two-story and the bungalow designs, the cost is the same, $4,990, with a down payment of $998. The monthly carrying charge, including interest, amortization, taxes, insurance and water, is only $39.12. The financing set-up is shown in the table, page 122.

(Continued to page 122)
SCIENTIFICALLY built cabinets which are attractively recessed into the wall are features of the Gross-Morton homes at Bayside Hills. Cheerful colors in red and cream are used.

BAYSIDE HILLS bathrooms are large and colorful, with tile floors and walls, best quality colored fixtures. The recessed tub and shower is popular.

SELECTED HOME DESIGNS

THE FIRST FIVE pages of this month's Design Section are devoted to plans and details of Gross-Morton's Bayside Hills houses. Complete specifications and construction details are given on pages 122 and 124.

16 Pages of Choice Examples of the Builders' Art; Presented on Special Coated Paper Stock
BEST PLAN IN U. S.

Arthur E. Allen, architect

THIS IS the standard plan of the 1,000 home Bayside Hills project of Gross-Morton Company on Long Island, N. Y. It has six rooms, ample closets, is extremely practical and economical. Over-all size is only 26 1/2 x 23 feet.
THE DUTCH Colonial above and the English design at left have the same floor plan and are two of the most popular styles featured by Gross-Morton in the Bayside Hills, L. I., project. Every detail has been studied for economical construction.

POPULAR EXTERIORS

Gross-Morton Corp., Builders

Specifications given on pages 122 & 124

LIVING room is 12'8" x 21'6". An attractive archway leads to the 11'10" x 12'8" dining room. Both rooms are exceptionally well lighted.
SUPER BATH, KITCHEN

Specifications on Pages 122 and 124.

BEAUTIFULLY tiled baths with recessed tub and shower sell the husband. Careful, efficient kitchens with mill-built cabinets sell the wives. These are two outstanding features of the Gross-Morton low cost bungalows shown on opposite page. Of course there are other features, too, such as the efficient floor plan below, studio living room and a large open attic which provides space for future family expansion.
Exteriors of the Gross-Morton bungalows are varied somewhat as above. Over-all dimensions are approximately 25 by 43 feet. Specifications and further construction details of these houses are given on pages 122 and 124.
OLD DESIGN
NEW CONSTRUCTION

Dutch Colonial of Brick and Stone
has Inner Frame of Steel

Trowell Construction Co.
Builder

Frank A. Miles
Architectural Design
This house of the popular, tried and true Dutch Colonial style for the exterior makes use of the latest ideas in interior arrangement and in construction and equipment. The exterior walls are 12-inch solid brick; interior bearing walls in basement 8-inch brick; floors of 8-inch Stran-Steel joists topped with 2 inches of concrete over which is laid 7/8-inch parquet wood flooring for all the principal rooms; the kitchen, pantry and maid's quarters being finished with linoleum, and bathrooms tiled. Basement is provided with big recreation room with cheerful fireplace. Heating system is Gar Wood air conditioner with oil burner. Incinerator is built into the basement, with charging door in the pantry above. Wood burning fireplace provided on both first and second floors as well as basement. Garage doors are upward-acting. Exterior walls decorated with field stone. Shingle roof and wood dormers; all main roof framing Stran-Steel.

FLOOR PLANS to the left show ample provision for all present day home requirements. Full use is made of the basement as well as of the first and second floors.
Six Selected Entrances

Cape Cod doorway; M. R. Johnke, architect.

Lovely Colonial detail; Wm. M. Pareis, architect.

Splendid porch and entrance detail; Randolph Evans, architect.
CLEAN COLONIAL
in a Washington, D. C., Suburb

Westhaven Construction Corp.
Builder

Schreier & Patterson
Architects


BELOW: Glimpse of living room.
IGNITY and social distinction are bound up in the Southern Colonial tradition. The two-story square columns supporting the high porch roof are one with the feeling of grandeur which this architectural style imparts. Often it is a form reserved for larger homes; but here we see it used successfully on a house costing less than $10,000. The construction specified for this house was wood siding laid eight inches to the weather, two by ten inch floor joists on 16-inch centers, supported in the basement on two lines of eight-inch steel I beams on three-inch steel columns. Ceiling and roof rafters are two by six inches. Roofing asphalt shingles.
NORMANDY TYPE HOME at Erie, Pa.
Frank A. Shutts & Carl E. Morrison, Architects
J. W. Anderson, Builder

COST KEY is 1,980-944-40-22-22.

TYPICAL WALL SECTION

BASEMENT PLAN
THE "Home of Tomorrow" is constructed of Haydite cinder blocks finished with "Colorcrete," a waterproof glazed covering, which will not absorb dirt. The blocks have acoustical and insulation qualities not found in ordinary cement blocks. The joists are of pre-cast Haydite concrete reinforced with steel; and both floors and roof are made with pre-cast cement floor slabs, over which is poured a smooth coat of cement. Kalamazoo Haydite Tile Co. furnished these products. The roof is of built-up asphalt under which is a double thickness of Insulite insulating board. The roof is by Cooper Hoekstra Roofing Co. The G. E. air conditioning and oil burning unit was installed by the Fred J. Hotop Co. The oil fuel tank is underground and the oil is fed into the combustion chamber of the furnace from above, through a new designed burner. Air ducts overhead carry warmed air to the rooms, and a secondary line returns cooled air to a reconditioning unit where the air is washed, filtered, reheated and recirculated.

KALAMAZOO'S
"HOME OF TOMORROW"

P. C. Schram Co., Builder
LeRoy & Newlander, Architects

COST KEY is 1.903-161-1050-45-28-12.

Working plans on opposite page; interior photos on page 66.
As one enters the Kalamazoo "Home of Tomorrow," he passes through a foyer and directly into the living room, which has a dining alcove literally joined in. This spacious living room is a gorgeous ensemble in blue-gray ceiling, step down moulded cove and a pleasing tone of yellow buff sidewalls, and furnished with modern-age furniture by the Goss Shop. A Bigelow carpet of enhancing design covers the entire floor and is laid over a heavy felt cushion. Partially separating the living room and dining alcove is a waist-high wall section of modernistic design, in which is an illuminated aquarium with chromium plated frame. In the opposite end of the living room is a cleverly arranged fireplace and open book shelves. Above is a large mirror which extends to the ceiling and the entire length of fireplace assembly. The windows are Vento steel outswinging casement, with bronze bearing crank-type openers and lever locks. The sills on each are of black Vitrolite and set the opening off to good advantage. The corner windows afford 100% more light area than the average openings, having about 42 square feet of glass surface. Venetian blinds, especially made for corner windows, have been installed to complete the assembly.
Are these Houses Best Value?

Contracts Let for First 5 Test Houses at Purdue

Each to Cost Less than $5,000

Housing Research Project Sponsored by University to Develop Cost and Performance Data

FRANK WATSON, director of Housing Research, Purdue University, has issued a "Progress Report" on the activities and findings to date of the Project launched last June at West Lafayette, Ind., for the purpose of studying, building and testing the performance of a number of medium cost houses of various types of design and construction; these houses to be built on an addition to the Purdue Campus and to be leased to and occupied by members of the scientific staff of the University.

Mr. Watson states in this Report that in the development of the details of the housing research program every effort has been made to conform to the expressed wish of members of the building industry to engage in research and study of a basically practical nature.

"We are now engaged in the actual construction of nine houses," he continues, "as a practical study of cost items. These houses are each of a different basic construction and represent the important materials and methods now available. Leading architects of the country have given freely of their time in designing the houses. Industry has been consulted on the proper use of the several materials employed. It may be fairly said, therefore, that these houses represent the best that can be done today in their respective classes.

"The specifications for these houses are an illustration of the practical approach which those in direct charge of the project have adopted. These specifications also reveal in a practical way the importance of the problem which lies ahead.

"Each house is designed to accommodate an average family of parents and one or more children of each sex. A garage is also listed as a necessity. This specification fits the mass of the prospective home owning public. The specifications also state that the house must be erected under ordinary conditions at a cost not to exceed $5,000. It is recognized that this requirement does not fit the mass of prospective home owners. (See Effect of Incomes, page 75.) Those in charge of the Project were directly cognizant of this fact. The general income level of the country will not support an extensive housing development even in the $5,000 price class. Preliminary studies revealed, however, that it is all but impossible in the present state
HOUSE No. 1 at Purdue follows the design awarded first prize in a recent small house competition by the New York Chapter, A.I.A.; J. Andre Fouilhoux, architect, New York City; construction details to right, floor plans on preceding page.

Outline Specifications—HOUSE No. 1

FOUNDATIONS
Concrete. Mix, 1 cement, 3 sand, 5 gravel

TERRACES AND WALKS
Poured concrete

FLOORS
1st floor
Fill, 5" tamped gravel
Slab, 3" concrete
Insulation, 2" cold storage type
Finish, hardwood blocks laid in mastic; Kitchen, linoleum

2nd floor
Framing, 2"x8" joists with 1"x8" T & G sub floor
Finish, hardwood strip flooring; Bathroom, linoleum

Garage floor and drive
Gravel

WALLS AND CEILINGS
Framing, 2"x4" studding, western type
Insulation, mineral wool bats
Exterior finish, cement stucco on paper backed metal lath
Partitions, 2"x4" and 2"x3" studding
Interior finish, 1/2" fir plywood
Ceiling finish, 1/4" fir plywood

ROOF
Framing, 2"x8" joists with 1"x8" T & G sheathing
Insulation, mineral wool
Roofing, 10 year built up roof
Flashing, #24 gage galvanized iron, painted

TRIM
Yellow Pine trim for windows, doors, base and picture mold, etc.

PAINTING
Lead and oil

WINDOWS
Wood, casement type. Screens

DOORS
Wood

WIRING
BX cable

PLUMBING
Enamed iron fixtures; piping, copper tubing
Water heater, 20 gal. boiler, automatic gas

HEATING
Forced warm air; automatically regulated
Automatic flash type oil burner

HARDWARE
Bronze and plated

CONSTRUCTION DETAILS
House No. 1
J. Andre Fouilhoux, Architect
Standing rib over panel joints
Double foil insulation
G.I. covering 24 gauge

Angle
Fir plywood
Beam

Steel Columns set approx. 3'-0" centers

Wall panel
Double foil and paper insulation
Wall and roof plywood panels insulated with metal foil.

1/2" Asbestos cement board

1/2" Fir plywood

Fin. floor painted conc.

Metal base 4" Conc. slab
4-1/2" Bars (continuous)

6" Cinders
Waterproofing felt

10" Round conc. piers at intervals.
3-1/2" Bars in each footing

CONSTRUCTION DETAILS
HOUSE No. 2
Howard T. Fisher, Architect.
John A. Pruyn, Associated.

HOUSE No. 2 of prefabricated asbestos cement and plywood panels on a steel frame; constructed by General Houses, Inc., Chicago;
Architects Howard T. Fisher and John A. Pruyn associated; construction
details and floor plan on this page, photo of construction activity on
page following.

of the art of construction to erect well built, satisfactory and salable houses at a much lower figure.

"It must be frankly admitted that the houses being built do not represent all that many erroneously believe to be an average American standard of living. It has been generally necessary to eliminate dining rooms. Motor driven oil burners and automatic stokers could not be included. Only the simplest kitchen layouts and equipment can be utilized. In fact, very few if any of the countless new materials and equipment can be included under the price specified. By cheapening construction, eliminating insulation, etc., more might have been made available in the way of luxury items. But those in direct charge of the project, as well as the architects and industrial engineers who assisted in the planning, were of the opinion that no compromises in the basic soundness of construction should be made in favor of such items.

"In order to parallel as nearly as possible the situation which confronts prospective home owners, bids on
WORKMEN assembling wall panels to steel frame, House No. 2 on Purdue University Housing Research Campus. Cold weather interfered very little with this operation.

the houses have been obtained from separate contractors, and no special price concessions from material suppliers have been permitted. The results of the bidding indicate prices of all the houses will be very close to the established $5,000 maximum limit.

"A study of what people are paying for rent and for home ownership leads to the assumption that the average family in the medium income groups cannot afford to pay in excess of 25 per cent of income for shelter. This is taken as a rough figure only as it varies with the income group and also with geographical areas.

"In calculating what price house this payment will support, amortization has been figured over the earning period of the family on the basis that if a family cannot expect to pay for a house within that period,
Outline Specifications—HOUSE No. 3

FOUNDATIONS
Concrete. Mix, 1 cement, 2\% sand, 4 gravel

FLOORS
- Basement: 4" concrete slab placed on earth
- 1st floor: 3\%" reinforced concrete slab on 8" precast, reinforced joists
- 2nd floor: Same as first floor
- Garage: 4" concrete slab placed on earth

WALLS
- Exterior: 6" reinforced concrete, 3/4" furring, 5/8" rigid insulation board, 1/2" plaster
- Interior: 6" reinforced concrete, plastered direct
- Partitions: 2"x4" and 2"x6" studding, Plaster on 1/2" rigid insulation board

CEILINGS
- 2nd floor: Plaster on 1/2" insulation board
- Kitchen: Suspended plaster and metal lath
- Living room: Exposed joists and slab
- Garage: 1" rigid insulation board

ROOF
- Framing, 8" precast joists, 2\%" concrete slab, 1" rigid insulation board
- Roofing, 10 year built up roof
- Flashing, #22 gage galvanized iron, painted

TRIM
- Yellow pine, base, mold, etc. No trim around windows

WINDOWS
- Steel casement, outswinging
- Screens, oxidized wire cloth

DOORS
- Wood

PAINTING
- Lead and oil
- Exposed concrete, 2 coats cement waterproof paint

WIRING
- Iron conduit

PLUMBING
- Piping, cast iron, wrought iron and wrought steel
- Water heater, 40 gallon automatic, gas fired
- Fixtures, enameled iron

HEATING
- Gravity warm air, coal fired furnace
HOUSE No. 4 at Purdue is of prefabricated sheet steel panel construction, sponsored by Armco and designed and constructed by the Insulated Steel Construction Company, Middletown, Ohio. Details of construction to right; floor plan on page opposite.

Outline Specifications—HOUSE No. 4

**FOUNDATIONS**
Concrete, 1:6 mix

**FLOORS**
Concrete, 1:2:4, trowelled finish 1:2, on fill 13/16" hardwood laid on 2"x4" creosoted sleepers
Kitchen and Bathroom, linoleum

**WALLS**
Frameless Steel sections, painted
Sections filled with insulating material
Walls and ceilings, plastic paint finish

**ROOF**
Cellular steel construction
1" rigid insulation board
Roofing, standard type built up roof
Flashing, #26 gage iron

**EXTERIOR TRIM**
Cypress

**WINDOWS**
Wood, double hung

**DOORS**
Wood

**CASES**
Wood

**WIRING**
BX cable

**PLUMBING**
Pipe, cast iron, galvanized iron, black iron
Water heater, 30 gallon range boiler with thermostat
Fixtures, enameled iron

**HEATING**
Forced warm air, gas fired furnace automatically regulated
HOUSE No. 5 at Purdue is of improved lumber construction, sponsored by the National Lumber Manufacturers Association, McNally & Quinn, architects, Chicago. Detail of construction on this page; floor plans, and outline specifications on page following.

Home ownership should not be attempted. Land values have been figured from $600 to $1,200, varying with the price of the house. Provision has been made for maintenance, taxes, special assessments and insurance.

"The result of these calculations indicates that:

- A $2,500 house is TOO EXPENSIVE for 35% of American families.
- A $4,500 house is TOO EXPENSIVE for 53% of American families.
- A $4,200 house is TOO EXPENSIVE for 66% of American families.
- A $5,100 house is TOO EXPENSIVE for 75% of American families.
- A $6,100 house is TOO EXPENSIVE for 80% of American families.

"The above figures are based on urban family incomes only. Farm incomes are much lower. The farm market may not be calculated on the same basis as the urban market, however. These figures are based upon 1929 incomes rather than 1935 incomes on the ground that we may properly build in anticipation of recovery and a more normal income level. 1929 figures are shown on page 75.
"Preliminary surveys have been made in the various fields in which cost reductions might be effected. When construction of the houses is completed and detailed cost information of their component parts has been obtained, a more thorough study will be possible. "These preliminary studies indicated no great practical possibilities in cost reduction. In materials, a great share, or what might be termed a disproportionate share, of cost appears in the distribution charges from original producer to ultimate consumer. Inasmuch as no one in this chain may be regarded as making too much profit, it follows that the only point of attack must be against the system as a whole. Such approach may produce savings in theory but the practical possibilities of making readjustments on the basis of any other distribution system looms as only a remote possibility. Experience has shown that the present system is apparently essential to the satisfactory merchandising of materials. No change seems possible short of a complete revolution engineered through the combined efforts of the entire building industry.

"Reduction of manufacturing costs in anticipation of increased volume appears as another possibility, but again it presents practical difficulties. Margins of profit are now slender in many lines. A ten per cent reduction in factory prices may wipe out profits for a considerable period and produce only a small saving to the home owner because of intervening distribution markups.

"In a different way, labor cost reduction in anticipation of increased volume does not appear as a practical possibility. Building trades wages are high in terms of hourly rates but generally low in terms of annual wages. This is due to the sporadic and seasonal nature of such employment. Since one day's labor becomes the next day's food for the worker, any reduction in rates in anticipation of increased volume is a practical impossibility. On the other side of the picture, it may be pointed out that the attitude of organ-
ized labor in general has not been one of wholehearted co-operation on the problem of reducing costs. New methods which look towards a reduction of labor on the job are often resisted. Such a policy can have only one result and that result is now being felt.

"Unfamiliarity and ignorance of new methods and materials on the part of contractors is another important obstacle to reduced costs. It should be reported, however, that few of the many new developments in the building field which have thus far been investigated have been based on cost reduction possibilities. Most new developments look toward furnishing a better product at an extra cost.

Effect of Incomes on Potential Home Ownership

"A more graphic portrayal of the effect of incomes on potential home ownership is shown in the following chart. This chart is confined to urban families and ignores the lower income farm families. The amount of this market now being utilized according to 1935 Dodge reports and the amount included under housing presently being studied at Purdue University is shown.

"An analysis of the data involved reveals that building in the present price range and letting the lower income groups find shelter in secondhand houses can only result in an annual volume of residential construction of one billion dollars. It also indicates that houses will have to be approximately two hundred years old before they become available at the lowest end of the scale. That this may not in fact be so is indication that the residential building industry is built upon the insecure foundation of selling people on the glories of home ownership and inducing them to purchase homes which they cannot afford.

"As has been indicated, all figures are based upon 1929 incomes and include only the urban family incomes. Following is the source chart of incomes from studies by the Brookings Institution:
Cinderella in the BASEMENT

EVEN THOSE readers who have seen thousands of before and after pictures may have trouble associating the air ducts, ashes, shovels, and bare brick wall shown in the upper right-hand corner of the following page, with the accompanying illustrations showing arched doorways, and attractively furnished rooms. This furnace heated the home of Frank E. Russell, heating contractor, of Cedar Rapids, Iowa, until he converted the basement into an attractive card room, billiard room, and recreation center.

Several factors helped furnish the golden slippers and carriage that transformed this Cinderella of the basement. First, Contractor Russell has planned and built several homes, although he never before attempted a modernizing job. Second, he has a plastering contractor, L. L. Augustin, in the family. Third, young people of the family have grown to the age when they like to entertain in a separate part of the house. But these changes would not have been possible were it not for the compactness, quiet operation, and general efficiency of present-day heating and air-conditioning equipment.

The basement originally had no partitions. There was an open stairway, and a triangular chimney near the center for a corner fireplace in the living room above. "Ordinarily in an air-conditioning job," explained Russell, "I should place the furnace at one end of the basement. In this case the heating plant had to be centered around the chimney. The furnace is custom-built steel to my own specifications. It has twenty-six 4" tubes for greater heating efficiency. A long smoke collar extends through the square casing into the chimney thimble, and the furnace is set against one side of the chimney." (See floor plan.)

A McIlvaine burner is fed by an underground oil line from a tank installed in the garage. The furnace is coupled with a Hold-Heat air-conditioning unit. This combination, according to Contractor Russell, makes it possible to have cleanliness, warmth, and head

MODERNIZATION

"which makes buildings of all kinds more cheerful, more livable and more salable"
A fruit room was dug out under the front porch, bricked, cemented, and equipped with an insulated door. Stone outer walls of the basement were leveled with cement, then waterproofed with Elaterite. A bond coat of gypsum plaster was then applied, and finished with Chromeroc, a tinted plaster, which was textured in the two large rooms, hall, and stairway. A 2" plaster cornice and cement baseboard were used to finish the card room and billiard room. A sand finish of the same material was used in the laundry. The furnace room is smooth white plaster, enameled white, and the shower is of Keene's cement, tiled effect.

"This is the first job of the kind I ever did," stated Russell. "I planned and executed all of it with the assistance of my family. We have received many favorable comments from those who have seen the basement, and have several parties contemplating similar improvements. This should be a profitable field for contractors, as it appeals to home lovers for many reasons. It certainly has made our home a popular place among our friends, and it is ideal for young folks who like a separate part of the house for their gatherings."

The modernizing that Contractor Russell has done in his spare time has practically added another floor to his home. It is a splendid demonstration of what can be done with modern space-saving heating and air-conditioning equipment.
Profits in Veneer Modernizing

INCREASING use of thin brick veneer for modernizing has brought out a number of interesting mechanical developments that simplify and speed up application. General advantages of the method lie in the fact that the light-weight thin veneer can be “hung” on existing walls. It also eliminates digging and foundation work, cutting and building up through porches, and changing eave lines.

Accompanying illustrations show one application of a thin veneer known as Brik-Lok. Most of the applications to date have been in Cleveland, where a number of contractors have specialized in the work and are said to have found it satisfactory from a profit standpoint. Other applications are reported all the way from New York City to western Indiana.

Each Brik-Lok slab has the face dimensions of a standard brick, 2½ x 8”, and is ¾” thick. A square, ¼” groove along the top and bottom of each slab is fitted into a locking device that holds it to the wall. L-shaped corners, with standard 3¼” returns are used. Sills of the same shape are made much heavier to provide more projection when placed in a rowlock course.

The wall is prepared for application by nailing vertical steel channels, 4½” O.C. These channels are made of 22g copper-bearing steel, galvanized, then aluminum coated after they are formed by punching extruding tongues that lock into grooves of the slabs before mortar is applied. Spacing of these tongues automatically provides a ¾” horizontal mortar joint.

An advantage claimed for the method is that the vertical channels are self-furring over lap or novelty siding, or over shingles.

Preparatory carpenter labor includes plumbing of walls, furring out low spots, leveling high points to a common plane, moving scaffold, application of building paper, and the nailing of channels. Average carpenter production is 1½ to 2 square an 8-hour day. On most jobs to date all locking in, cutting, and mortaring was done by bricklayers, who average 1½ squares a day. Incidental materials average $3.00 a square.
The Parentage of Modern Home Improvements

By V. L. SHERMAN
Department of Mechanical Engineering, Lewis Institute of Technology, Chicago

Coal stokers seem to be the topic of so many who ask concerning "modern" equipment. And those genuinely concerned are not seeking for "modern" equipment nearly so much as equipment for comfort. On a recent Sunday visit the question came up. All I was asked was in the nature of corroboration. This was not hard to give. But while I was there I chanced a couple of pictures to use in this article. If the place was built for anything it was certainly built for comfort. The living room has a large fireplace and opens onto a large sun-parlor. But, besides, it has four large windows which give just the light for eye comfort.

One of the main inquiries this month has been regarding illumination. It is a pertinent subject and one which will be followed. Times have changed, and designs as well, since the days of high ceilings and tall windows. But we find that in their way they provided just what many of us wish we did not lack, ventilation and ample lighting. Figure 1 shows a living room which gives every means to proper lighting.

There has been a gradual change for the better in windows. As houses were built smaller to compensate for increasing costs, the question of windows was often a question of appearances, chiefly from without. But as it became a growing question of appearances the manufacturers set out to design and build better windows for the smaller types of homes. The present nature of windows is just about in the class of mechanical equipment. Windows of both wood and metal are built today from a different viewpoint. They accept a good deal of responsibility. They give plenty of light, even to the ultra-violet if you wish. Although probably smaller than their progenitors they are a graceful part of the structure. They certainly are built with strength even if lighter in weight. But when it comes to snugness and general fit they are way ahead. If a home is to be air conditioned the market can provide double-glazing even with the single sash.

In this home referred to there was the question of refrigeration. If the mechanical refrigerator were to be placed within the kitchen the question of space became an important one. But the refrigerator does not have to go on the kitchen floor. The modern type can be placed as was this one shown to the right in Figure 2. The door to the refrigerator is placed where it is wanted in the wall, and the mechanism takes care of itself.

There was a time, too, when unless you had the
MECHANICAL EQUIPMENT FOR 20-YEAR FINANCED HOUSES

proper floor space you could not have the refrigerator in the kitchen. But those days have passed, as witness the little one to the left in Figure 2. It exactly replaced a small ice-box except for height, and only the window sill needed chamfering.

Inquiries regarding duct-work, wall grilles, and forced circulation are numerous. Are these recent installations effective? Why the sudden change? Are such arrangements more satisfactory? To bring out one or two points I took the two photographs shown in Figure 3. This place was built twelve years ago for a gravity feed system, although soon afterward two small fans were installed in the cold air return which might seem to make it a forced air circulation job, if one wished to stretch a point or two. As shown in the photograph the hall has a false ceiling. Above this ceiling is the main warm-air trunk. Branching from this trunk are ducts supplying each room. The left-hand picture shows one of two grilles in the living room. The one to the right shows the grille in the wall of the dining room. At the far end of the hall at the left can be seen the orthodox cold air face in the hall floor. There are two other cold air faces in the house.

It is a fact that this warm air heating system has worked very well and economically in this house since it was built twelve years ago, but it is also a fact that while such systems were, for their times, satisfactory, the more recent installations, their descendants, are much more satisfactory. The warm air, or cooled air, is positively circulated. The duct-work is more compact and consequently takes up less space. The insulation of ducts is improved and with the decrease in duct section the heat losses are reduced. The grilles are smaller and more conveniently placed. The cold air returns are more numerous with the result that the room circulation is better controlled to varying needs.

These so-called modern improvements are not the impetuous lot that some of us think. They come into use through previous efforts which have shown good results. And the results are even better now than many of us expected. One questioner points out that for the amount of air poured through a duct the circular sectioned duct will have the least surface. Of course this is true. But if we compare the heat-losing surfaces of a group of circular sectioned leaders with those of a well designed trunk and branch system of duct-work that comparison does not hold at all. And when it comes to feed and return of warm air the latter system is so much easier to handle and more economical.

Besides this there is the problem of space. A trunk or a nest of ducts can perform contortions under the basement ceiling that would be impossible with the old time leaders.

The whole set-up of the Federal Housing Administration points to the necessity of real home building, the very opposite of building for speculative purposes. Real homes are not ready-to-wear affairs. Probably they never will be in this country. But some of the essentials in home building have been pretty thoroughly organized along much improved lines. This is true especially of mechanical equipment. But such equipment and such improvement is not of the orphan type. All good, modern equipment comes of very good family.

Figure 4 is shown here in answer to inquiries regarding the necessity of providing special and expensive ducts for residential work. The drawing is meant to show that stock pieces in various sizes are available for this type of work. Not only does the chance of getting these pieces facilitate planning but there is a sureness in the branching and turns and in the joints as well. There is also a certainty about the gage.

From the East comes a letter: "In the January issue of the American Builder I note on page 57 a centrifugal pump and on the same page you mention compact pumps of this type of capacity between 30 and 800 gallons per minute and pumping against a head of 350 feet..."

The progress in recent years in the design of pumps has been considerable. The study of fluid flow, whether air or water or some refrigerating medium, and the means for producing that flow has been intensive. Any of us may realize what a change has taken place in the pumping machinery of our city water supplies. The older pumping equipment would seem cumbersome to us now if we were to see it in the pumping stations. Just so has the fan and blower stepped up in design. But it is not entirely fair to give entire credit to the pump designer. The pump drive is just as important. In one type of drive, for instance, there is an approach to perfection. The direct-connected motor-driven pump is about as reliable and substantial as anyone could ask for. Motor drive is

FIGURE 3. A gravity warm air system twelve years old with the trunk above a false ceiling in the hall.
not new, of course, but the vast variety of power, speed, and voltage is to be wondered at. There is hardly any single need that cannot be filled, and I suspect that should a special requirement be met the motor builders would be able to pick it out of the air ready for use. Figure 5 shows a substantially built motor in what might be termed a dynamometer mounting on cushions, with a seasonal lubrication service.

It would be rather easy for me to grow enthusiastic over motor drives. Just for curiosity I have put them to all sorts of physical abuse, let them get dirty, broken the brushes, let the dirt accumulate on the commutator, and still they would run. Of course that is no way to treat a motor, but without doubt many of us do treat them that way, and the manufacturers return our human weakness with human kindness. (Overloading a motor, however, is not a human weakness.)

Letters have come in regarding insulation of houses. As a favorite topic these pages could be filled over and over with notes on insulation. The previous article dealing with insulation did not get very far into the subject. The question of insulation of walls, windows, floors, roofs for heat and for sound is a long subject. Insulation of pipes and surfaces of high and low temperatures is just as important and full of matter. The same is true of duct-work, and of other sources of heat or cold.

It seems to be a fact, shrewd as many of us are, that the average home owner has very little idea of the purpose or value of suitable insulation, and that it is just as necessary to emphasize the use of insulation in demonstrating the advantages of a heating or cooling system as it is to emphasize the proper finishes for wood surfaces when urging the selection of beautiful flooring or paneling. They must go together.

When an association of manufacturers will spend hard earned cash and years of time to determine the heat transmitting properties of various wall types it is time for the smart prospective owner to know that he cannot install a good piece of heating or cooling equipment and expect less than grief without properly insulating his house and the plant.

Wallace Ashby Corrects Housing List

Washington, D. C.

To the Editor:
The November issue of the American Builder contained a compilation of firms advocating various types of house construction. We wrote to most of the firms requesting literature and have received prompt replies. Your list proved a convenient source of reference. We are sending you the information below as it may be of interest.

The following firms advised us that for a number of years past they have discontinued making steel houses:

G. & J. Weir, Ltd., Cathcart, Glasgow, S.A.

Letters to the following firms were returned unclaimed:

Societe de Constructions Metallique Filled, Paris, France.
Societe de Construction Multi-Cellulaires, Paris, France.
Aluminaire House, -Syosset, Long Island, N. Y.

Their return might have been for insufficient address.

We were very pleased by the courtesy of the Forges de Strasbourg which telegraphed their representative, who was scheduled to sail in a few days from New York, to visit us in Washington and explain their method of building.

WALLACE ASHBY, Chief,
Division of Structures,
U. S. Department of Agriculture.
American Builder, March 1936.

Large Apartment Building Costs


A STUDY of the costs involved in building Knickerbocker Village reveals important figures on this type of project as are shown in the report of the Bureau of Labor Statistics. A summary of the findings is given on these pages.

Knickerbocker Village was built by the Fred F. French Company with the aid of a loan of $8,022,000 from the Reconstruction Finance Corporation. The project was started in 1933. One unit was ready for occupancy Sept. 25, 1934, and the other unit in December of the same year. The total cost of the development, including land and buildings, exceeded $9,500,000. Both buildings are 12-story, red brick structures, and together are capable of housing in the 1,593 dwelling units provided a population of about 6,000. The apartments were designed primarily for white-collar workers. Monthly rentals average $12.50 a room. A number of thoroughly modern 2½-room apartments, however, rent for $22.50 a month. The highest rent is $87.50 for a 5-room penthouse apartment.

Because of its size and type, Knickerbocker Village provides an unusually good basis for measuring the labor requirements in building construction. Labor costs here used, for example, include only the cost of labor performed at the site of construction. The figures relating to material costs cover the cost of the materials laid down at the site of construction, including freight and drayage charges, and all shop labor required in fabrication.

The overhead charges included workmen's compensation insurance (amounting to approximately 10 per cent of labor cost), and other costs, such as maintaining and hiring concrete mixers, hoists, steam shovels, and other equipment. This analysis should be used in reference only to fireproof, multiple-story, elevator-equipped apartment house construction.

Table 1.—Construction Costs Per Cubic Foot and Man-Hours of Direct Labor Per 1,000 Cubic Feet Involved in Construction of Knickerbocker Village

<table>
<thead>
<tr>
<th>Class of work</th>
<th>Construction cost per cubic foot</th>
<th>Man-hours at site per 1,000 cubic feet</th>
</tr>
</thead>
<tbody>
<tr>
<td>All classes of work</td>
<td>$0.468</td>
<td>132.56</td>
</tr>
<tr>
<td>Excavation and grading</td>
<td>$0.015</td>
<td>7.62</td>
</tr>
<tr>
<td>Cement and concrete</td>
<td>$0.055</td>
<td>18.27</td>
</tr>
<tr>
<td>Masonry</td>
<td>$0.072</td>
<td>27.22</td>
</tr>
<tr>
<td>Carpentry</td>
<td>$0.030</td>
<td>7.15</td>
</tr>
<tr>
<td>Plumbing</td>
<td>$0.044</td>
<td>30.37</td>
</tr>
<tr>
<td>Heating and ventilating</td>
<td>$0.021</td>
<td>5.06</td>
</tr>
<tr>
<td>Lathing and plastering</td>
<td>$0.028</td>
<td>5.89</td>
</tr>
<tr>
<td>Roofing and sheet-metal work</td>
<td>$0.002</td>
<td>76</td>
</tr>
<tr>
<td>Structural steel</td>
<td>$0.017</td>
<td>53.22</td>
</tr>
<tr>
<td>Electrical work and fixtures</td>
<td>$0.011</td>
<td>4.90</td>
</tr>
<tr>
<td>Painting and decorating</td>
<td>$0.011</td>
<td>4.90</td>
</tr>
</tbody>
</table>

Table 2.—Labor, Material, and Overhead Costs Involved in Construction of Knickerbocker Village

<table>
<thead>
<tr>
<th>Class of work</th>
<th>Total cost</th>
<th>Labor at site</th>
<th>Material</th>
<th>Overhead and other</th>
</tr>
</thead>
<tbody>
<tr>
<td>All classes of work</td>
<td>$6,216,899</td>
<td>$2,019,818</td>
<td>$2,636,179</td>
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<td>Cement and concrete</td>
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<td>275,377</td>
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<td>Masonry</td>
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<td>266,281</td>
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<td>Carpentry</td>
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<td>Heating and ventilating</td>
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<td>Lathing and plastering</td>
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<td>135,248</td>
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<td>56,152</td>
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<td>40,194</td>
<td>30,798</td>
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<td>Weatherproofing</td>
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<td>20,410</td>
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<tr>
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<td>Engineering and supervision</td>
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<td>109,901</td>
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<td>Architect's fee</td>
<td>204,185</td>
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</table>

Table 3.—Labor Cost, Average Hourly Earnings, and Man-Hours of Direct Labor Involved in Construction of Knickerbocker Village

<table>
<thead>
<tr>
<th>Class of work</th>
<th>Labor cost at site</th>
<th>Average hourly earnings</th>
<th>Man-hours at site</th>
</tr>
</thead>
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<tr>
<td>All classes of work</td>
<td>$2,019,838</td>
<td>$1.148</td>
<td>1,759,640</td>
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<tr>
<td>Excavation and grading</td>
<td>89,677</td>
<td>.887</td>
<td>101,143</td>
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<tr>
<td>Cement and concrete</td>
<td>273,375</td>
<td>1.127</td>
<td>242,325</td>
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<tr>
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<td>466,281</td>
<td>1.143</td>
<td>407,976</td>
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<tr>
<td>Carpentry</td>
<td>119,161</td>
<td>1.253</td>
<td>94,939</td>
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<tr>
<td>Plumbing</td>
<td>178,269</td>
<td>1.294</td>
<td>137,628</td>
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<tr>
<td>Heating and ventilating</td>
<td>82,721</td>
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<td>67,153</td>
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<tr>
<td>Lathing and plastering</td>
<td>105,494</td>
<td>1.205</td>
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<tr>
<td>Roofing and sheet-metal work</td>
<td>68,216</td>
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<td>86,947</td>
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<td>53,570</td>
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<td>92,441</td>
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<td>81,283</td>
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<td>Elevators</td>
<td>25,552</td>
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<td>Tile, terrazo, &amp; bathroom fittings</td>
<td>45,194</td>
<td>1.211</td>
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<td>Weatherproofing</td>
<td>29,410</td>
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<td>31,830</td>
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<td>Glazing</td>
<td>4,472</td>
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<td>Equipment</td>
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<tr>
<td>Miscellaneous</td>
<td>72,828</td>
<td>.583</td>
<td>144,816</td>
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The total cost of the manufactured metal products was $232,070. This group covered a wide range of materials, but ironwork for the store fronts and stairs accounted for 21 per cent of the total and approximately 28 per cent of the total was accounted for by kitchen cabinets. Door frames, entrance and elevator doors were steel; moldings were also made of metal. These products amounted to 44 per cent of the total.

The class designated as equipment was made up of electric refrigerators, gas ranges, laundry dryers, and miscellaneous fixtures. The cost of the refrigerators was $103,480, the gas ranges $36,081, and miscellaneous equipment $3,221. The miscellaneous group included such items as watchmen's wages, general cleanup work, removal of debris, cleaning of bathtubs and windows, and the finishing of a small auditorium in the basement.

The builder's fee of $340,098 represented the amount received by the Fred F. French Company for the assumption of the building responsibility in addition to the general overhead and profit for supplying the masonry work. The architect's fee of $109,901 included, in addition to the preparation of the plans, some inspection work at the site. Financial and other charges of $264,185 were made up of interest on loans during construction, bond expense, mortgage expense, accounting expense, and other costs.

Cost Distribution Shown on Chart

The relationship between labor, material and overhead (including profit) costs on the Knickerbocker Village project is indicated by the vertical divisions of each separate class of work in the chart on the right. It will be observed that in excavation and grading, the amount expended for labor and materials represented 47.75 per cent of the total charges and the overhead charges amounted to 52.25 per cent of the total. By contrast, the combined labor and material costs involved in the installation of the elevators amounted to 99.55 per cent of the total.

This chart also shows the per cent that each class of work forms of the total building cost. The man-hours involved in each of the major classes of work are given in table 3, and also the average earnings per hour for each group and for the building as a whole. These average earnings are a composite of the wage rate of all the workers included in each specified group. In all instances, the rate of wage was the union scale.

A cubic-foot comparison of the costs of construction was obtained by dividing the costs of the various classes of work by the total cubic contents of the building—13,275,000 cubic feet. In a similar way man-hours per 1,000 cubic feet were calculated for the different classifications. These computations, which are of value for comparison with those of similar projects, are presented in table 1.
Some Simple Wrinkles with the Steel Square

By ERNEST I. FREESE

Diagram 1: How to draw a semicircle with the steel square.

Determine the desired diameter, and drive a fine brad into the board at each diametral extremity, allowing the brads to project somewhat above the surface. Place the square against these brads, in the manner shown, and hold a pencil snug in the angle of the square. Now move the square, but keep it in constant sliding touch with the two brads. The pencil point will then trace a true semicircle having the given diameter. If this diameter does not exceed the projection of the short blade of the square, then the semicircle can be drawn in one operation. But, by drawing a quadrant at a time, that is, by reversing the position of the square, blade for blade, a semicircle can be drawn having a diameter 40 per cent greater than the projection of the short blade.

Diagram 2: How to lay off angles with the steel square.

From the relations here clearly shown and noted, the commonly-used angles of 15, 30, 45, 60 and 75 degrees may readily be laid off in relation to any given line AB or EF, and from any given point C thereon. The methods are exact. Proof: The trigonometrical tangent of 45 degrees is 1. The trigonometrical secant of 60 degrees is 2. The other angles are gotten by graphical addition and subtraction, as the Diagram makes evident.

Diagram 3: How to lay out a five-point star with the steel square.

Lay off AB equal to the width desired. Mark point C, the center of AB; and draw the center line through C, square with AB. Lay the square along AB with the 11" mark at A. From this point, a straight line
passing through the 8" mark, on the other blade, locates point D on the center line of the star. Now make CE equal to CD; and make AF and BG each equal to AB. The required five points, A, D, B, F, G, are therefore found; whence, the remaining procedure is obvious.

The method is practically exact, since the fraction, 8/11ths is an exceedingly close approximation to the trigonometrical tangent of 36 degrees.

Diagram 4: How to determine pipe sizes by the steel square.

Example: Assume that two furnace pipes, A and B, having diameters of 5" and 12", respectively, are to branch from a single main pipe C whose capacity shall equal the combined capacities of A and B. What is the required diameter of pipe C? Well, just read it off, 13" on the rule; the distance between the 12" mark on one blade of the square, and the 5" mark on the other blade. The required diameter of the main pipe is equal to the hypotenuse of the right triangle whose other two sides are the diameters of the branch pipes. It always works. And, moreover, by an obvious extension of the same principle and process, the diameter of a main pipe may be found such that this pipe shall have a capacity equal to the combined capacities of any number of pipes of given diameters. No calculation whatsoever is necessary. Just read off the required diameter from the rule laid across the rectangular blades of the square, in the manner shown.

The method is exact. Proof: The areas of circles are to each other as the squares of their diameters. The square on the hypotenuse of a right triangle is equal to the sum of the squares on the other two sides.

Diagrams 5 and 6: How to determine notch-cuts by the steel square.

Diagram 5 shows the usual and erroneous method of letting one timber into another. Never do it that way.

Diagram 6 indicates the correct method of framing such a joint.

Proof: It is a principle of mechanics that, in order to avoid secondary or "moment" stresses in a framed joint, it is necessary that the centroids of action and reaction meet in a point. The layout at Diagram 6 fulfills this condition, since the angle of junction ACB is a right angle. If the line DE, at any convenient scale, represents the compressive stress acting in the brace or strut, then the lines DF and DG represent the resolved components of this stress on the planes BC and AC, respectively. Wherefore, without indulging in a further discussion of graphic statics, it may be briefly stated that the joint at Diagram 6 is not subject to either secondary or indeterminate stresses. On the contrary, the only stress acting on the planes of juncture is direct compression. Which is as it should be. The same can not be said of the joint at Diagram 5, though probably 999 carpenters out of a thousand would so frame it!

Stair Framing Suggestions
By OSCAR G. KNECHT
Chief Building Inspector, San Diego, California

We see and read many and lengthy articles covering the subject of finished wooden stairways, rise and run, tread and riser, housing, wedging, gluing, finish, etc., but very little seems to be written about the rough framing and structural supports. In fact, many specifications mention stair framing in a vague manner, leaving entirely too much for the carpenter to calculate and work out. In view of these facts, this article will be devoted primarily to the rough framing and structural supports.

Structurally speaking, a great many wooden stairways are framed and built by rule of thumb methods, rather
than follow methods prescribed by sound, rational engineering practice. Consequently, the main supporting parts are often weak and over-stressed when loaded to capacity. In fact, many stairways are more or less unsafe, as evidenced by the failures we witness or read about every now and then. A careful inspection will often reveal initial or partial failure, especially in old buildings after all shrinkage and more or less settlement has taken place.

Describing the accompanying drawing in general: (S) denotes the supporting stringers, usually spaced 16 inches to 24 inches apart, depending on the live load requirements and length. (R) indicates a stitch reinforcing member, extending full length of stringer and effectively nailed thereto. The member (R) is often used to reinforce the effective depth or double the strength at (d). (H) is the header or upper support for the stringers. (B) indicates short blocks or solid bridging often necessary to add stiffness and buckling resistance to header (H). At (e) are shown nailing blocks fitted between the stringers and spiked to the header (H). The stringers are faced nailed to blocks (N) as indicated at (h). This face nailing is often necessary when sufficient end and toe nailing between (S) and (H) cannot be provided at (e). See Fig. No. 7.

Figure 1. Here we have a method of supporting the top end of a stair stringer when the headers (H) are none too deep. The top of the stair stringer which receives the first tread is made flush with top of joist. The diagonal sub-floor ties the stringer, joists and header together. Toe nailing area is provided at (e). The shelf or bearing strip (L) provides additional support. By providing 4 16 d. toe nails at (e) and securing (L) with 20 d. nails 4" o.c. a 700 pound vertical support can be furnished the upper end of each stringer (S) when stringers are spaced about 16 inches o.c. The upper tread at (a) should be at least 4 inches wide. Otherwise the rear end may work loose and spring up when you step near the nosing.

Figure 2. Shows a good method for supporting long or important stair stringers. A continuous shelf angle is bolted to the headers (H). A continuous nailing strip (L) is bolted to the angle. The stringers are secured to (L) by toe nailing at (g). A reinforcing strip (R) is spiked to the stringer (S). See Section (x-x). The shelf and supporting steel angle can be made to support any reasonable load, depending upon strength of header, size of angle and number of bolts.

Figure 3. This is another method of supporting very heavy loads. Joist hangers (J) are provided for the upper end of each stair stringer. Several toe nails may also be added at (e).

Figure 4. This method is somewhat similar to Figures 2 and 3. It has the advantage of avoiding an exposed resistance to header (H). (N) is the header (H), Figures 2 and 3. A steel strap (A) usually two inches wide and 3/16 of an inch in thickness is bolted or lag screwed to the headers (H). A small margin of additional strength and anchorage is obtained by providing nailing blocks (N). The 3/4" x 4" lag screw should be at least 3 inches from the bent steel edge as shown.

Figure 5. This shows a very common method, and no doubt the worst method. This stringer (S) is usually toe nailed to the header at (e). Also end nailing through from the back of (H) is often resorted to. If 8-16 d. nails could be effectively used for nailing toe nailing (H) and (S) together at (c) we could develop a safe supporting strength of only 300 pounds

(Continued to page 128)
Wherever sheet metal is used...

TONCAN IRON provides added protection

There is a better sheet metal—Toncan Copper Molybdenum Iron—for use wherever sheet metal is used. Home builders appreciate being told about it. Home buyers realize the value you put into your buildings when you use it. Both are glad to pay the trifling premium for this better sheet metal and the added protection it provides.

Toncan Iron is an alloy of refined iron, copper and molybdenum—a rust-resisting alloy that lasts years longer than other ferrous sheet metal only slightly cheaper in first cost. For 27 years, it has been proving its superiority in furnace jackets, ducts, roofs, gutters and spouts, flashing—wherever sheet metal is subjected in service to moisture or the elements—wherever the damaging fingers of that greatest of all racketeers, RUST, exacts a wasteful toll.

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"Standard" NEO-ANGLE BATH

Sit comfortably while you bathe

Have ample elbow room

Speed the bath—two at a time

Have plenty of space for immersion

49 INCHES

48 INCHES

DOWNWARD VIEW OF THE NEO-ANGLE BATH

IT'S A FULL SIZE BATH
IS IDEAL FOR SMALL HOMES

SAYS CHARLES REIS,
Leading New Jersey Builder

“Our experience in building more than 2,000 homes led us to select the "Standard" Neo-Angle Bath for small homes. It conserves space and has a distinctive sales appeal. It is one of the features that sells new homes.”

IN ALL parts of the country . . . in small homes, as well as large homes, apartments and hotels . . . the "Standard" Neo-Angle Bath is being featured today as the distinctive mark of the modern home. Its unusual design, its roomy bathing space, its seats in two opposite corners, its saving of valuable floor space, have won the approval of Home-owners, Architects and Builders. It is truly "the bath of the future for the homes of today."

Typical of the many installations of the Neo-Angle Bath in small homes are the 54 residences built by Reis Homes, Inc., in Englewood, and Tenafly, N. J. These homes are built-to-order at a cost ranging from $5,500 to $6,990. All of them feature the "Standard" Neo-Angle Bath.

Many home-owners today are requesting the "Standard" Neo-Angle Bath because it offers bathing features that appeal to the whole family. Its bathing space is as long as the usual recess tub and six inches wider. The convenient seats make it safe and convenient—provide an ideal foot bath. And the Neo-Angle is an ideal shower bath.

Feature the Neo-Angle in your small homes, too. For complete details see pages 1AA to 1-AH of your "Standard" Catalog or write today for literature.
Adjustable Roof Jacks

These jacks are adjustable to fit almost any pitch roof and are very convenient for any bricklayer or mason to have for chimneys that come out at or near the ridge. They are the biggest time saver I have ever seen. Place one jack on each side of chimney (or where chimney is to be), adjust to fit roof and they are ready for scaffold boards or planks. I have used a pair of these jacks for ten years and would not do without them. The nut on threaded rod should work freely to assure speed in adjusting.—Wayne Hunt, Mason Contractor, Bellevue, Ohio.

Filling Wall and Tub Joint

I am a builder and have found one trouble around bath tubs that can be easily corrected. This is the point where the plaster breaks or rots away, due to water getting in between the wall and tub.

Use mixture here.

Plastic mixture used to fill crack above tub.

Lining Up Shingle Courses

I am sending you a sketch of the way I use a chalk line to line up hexagon strip shingles.

On a straight roof, I start in the usual way until the first course is laid. Then I measure from the facia to the right hand corner of the cut out as shown in drawing. This may be any distance along the bottom edge of the roof to point A. Then I take the same measure on the ridge point B. From point A to point B, I stretch a chalk line, and line up the corner of the tabs of the next course on the chalk line; this helps to get the shingles in line.

On the hip roofs I measure the center of the ridge and the center of the bottom edge of the roof and stretch the line, then lay the shingles both ways from line.—John F. Hurst, Builder, Blanding, Utah.

Building Solid Brick Steps

I am sending a sketch of a front entrance steps which I have found to work out well. It seems that no matter how good a job the mason does, the bricks in time are apt to become loose and fall out. To avoid this we use bricks that have two holes through them on the face. These are set out in rows to form the proper size for the steps and ½-inch iron rods run through the holes. They are then set in place on the concrete base, mortar worked in the joints and the ends capped or plastered over to cover the rods which come out the sides.

If one brick later becomes loose, it won't fall out as the rods anchor them in place. Steps built this way will last for years.—Melvin O. Phelps, Builder, Montpelier, Idaho.
The parade will start at the height of the 1936 building season in April.

- All of the strongest and most active contractors, builders, and dealers of the country will be in the "reviewing stand" when the big annual parade of materials, products, and equipment used in building appears in the April, 1936, Specifications and Buying Number of AMERICAN BUILDER.

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Cleveland
Cross-Bridging for Old Buildings

This is a method of cross-bridging old building joists as there are very few of the old buildings that were bridged when being built. In order to be able to drive the nails and to draw the ends of the bridging up tight, it is necessary to cut the bridging pieces so they will be about two or three inches less than right angle to the joists. The opposite bridging piece in between the next joists should be nailed end-to-end before to prevent forming a spring in the joists. There are many old buildings that need this treatment to take the shimmery out of the floors and stop sagging of the ceilings.

Henry M. Lake, Draftsman, Cottage Grove, Ore.

Setting Porch Columns

It is not as easy as one might think to set round porch columns so that the sides of the caps will be parallel with the sides of the base blocks. This is not difficult, if the columns are set in place after the chord has been framed and finished. But very often the columns are set before any of the framework above is put together. This, in many ways, is the most economical method of setting porch columns, especially for small porches, and I am not so sure but what it is also the most economical method for porches of greater importance. Fig. 1 is a perspective view of a round column, cut to the right length with the cap nailed to it. After this is done, the column is laid on an even surface—a good level floor will do—and with the steel square and pencil mark a perpendicular line through the center of the base of the column, as indicated on the drawing.

This done, place a witness mark at each end of the line, A and B, to show center line on sides of column. The base blocks should now be set in line and on a level, after which strike a chalk line through the center of the base blocks, about as shown by the dotted line A-B, Fig. 2. On setting the columns, make the witness marks, A and B, Fig. 1, intersect with the points A and B of each base block shown on Fig. 2. If this is painstakingly done, the sides of the cap, shown in perspective in Fig. 1, will be parallel with the sides of the base block on which the column will be set.

H. H. Siegele, Emporia, Kans.

Door and Sash Jig

Here is the way I built a jig for planing doors and sash which is shown in the drawing. The base is made of a piece of 2x6 with a piece of 1 x 6 nailed on at the angle of approximately 30 degrees. It has a 1 1/2 x 3 inch slot and a vertical support nailed under it. Two pieces 1 x 2 inches are nailed into the top of the base 1 1/2 inches apart.

The door is set in between these pieces and the end is pushed into the slot in the angular piece. This holds the door steady and the jig may be easily moved to any part of the house.

Charles Redington, Jr., St. Petersburg, Fla.

Method for Lifting or Pulling

I am sending a useful method of getting a powerful pull or a hoist without blocks or mechanical power. All that is necessary to have is a strong piece of rope and two small poles about 4 inches in diameter and about 4 feet long.

How to do it: Simply tie both ends of the rope fast but allow enough slack so it will be possible to get one wrap of rope around one of the poles we will call a "drum pole." (Fig. 1.) This drum pole should be placed more to one side. The reason for this is that it will give a person more leverage holding it in a position about 90 degrees from the line of rope. Next comes into play what we will call a "leverage pole." Place the "leverage pole" under the "drum pole" and nip the rope with the end, then raise the pole and wind it around the drum pole, shifting the rope at each turn so the strain on the rope will center equally on each side of the "leverage pole." (Fig. 2) A little practice with ordinary string and two matches or pencils should convince anyone of its great value. Where a powerful pull is needed but nothing is available except a piece of rope and a couple of poles or iron pipes or bars, two men can pull more than a team of horses. The poles do not necessarily have to be 4 feet long; they may be more or less.

I do not claim the above to be original. My forefathers have used this method for ages in their native country, Finland.

Victor Makeela, Builder and Carpenter, Tower, Minn.
This Spring...
plan on a larger market for
BRONZE SCREENING

Because people everywhere are
learning these 4 facts:
1. Bronze Screens cannot rust.
2. Bronze Screens do not need patching.
3. Bronze Screens last years longer.
4. Bronze Screens save far more than
   their slight extra cost.

Year by year the long, dependable, expense-free service that bronze screening gives is widening your market for this product. More and more people—your customers among them—are recognizing the economy of bronze screens...are learning that the slightly higher first cost is more than made up for by long, satisfactory, rustless service.

This means a larger market for bronze screening this spring. Get ready for it! Be sure to carry an adequate stock of bronze screen cloth. And remember—customers who buy it will expect it to stand up year after year! To secure maximum service, the wire should be of the standard gauge set by the U. S. Government, the A. S. T. M. and the Wire Screen Cloth Manufacturers' Institute. It measures .0113" in diameter, and makes up into 16-mesh cloth which weighs not less than 15 lbs. per 100 square feet.

Now is the time to order bronze screening from your wholesaler! We do not make screen cloth, but furnish Bronze Wire to leading screen cloth manufacturers.

Once again in these widely-read home magazines Anaconda Bronze Wire for screens will be advertised to people who will buy from you.
NEW PRODUCTS
FOR INFORMATION ABOUT any new product write American Builder Information Exchange, 105 West Adams Street, Chicago, Ill.

Ro-Way Door Operators
A NEW electric door operator that instantly reverses its direction is now being produced by the Rowe Manufacturing Co., Galesburg, Ill. In addition to the standard “open-close-stop” button control, the Ro-Way operator employs a two-button station which changes the travel of the door no matter at what point it may be. The unusual feature is that a single phase motor is employed. Polyphase and direct current, however, are also standard.

On the larger sized doors a magnetic brake is furnished further to increase the safety factor. The possible mechanical shock of reversal is taken up by a “floating power” scheme of construction which is said to add years to the life of the equipment. The designers call it the operator “which refuses to be abused.”

The Ro-Way line covers every type of overhead door operation—from small residential installations to large commercial jobs, the appropriate equipment is listed for prompt delivery.

A large variety of controls is available—ceiling pull switches, toggle switches, electric eye control, floor treads, and constant pressure buttons can be furnished. In addition to the conventional control devices, a new magnetic driveway switch has been developed. With this switch hidden from sight in the path of a car approaching or departing from the garage, the driver may open or close the door without leaving his seat or slackening his pace. (See illustrations.)

Corrugated Snap-On Mouldings
A NEW line of corrugated patterns has been added to their designs of stainless steel Snap-On mouldings by the Pyramid Metals Company, Chicago. The new pattern shown, 16-CS, 3/4 inch, is made with the Pyramid Snap-On feature, having no exposed nails or screws after application. Installing labor is claimed to be 50 per cent less than with the old style moulding, being applied on top of any background material. Pyramid mouldings are also available in bronze, copper or brass.

Wall Box Kitchen Ventilator
A FULL automatic wall box kitchen ventilator, a built-in type for permanent installation in new or old homes, is being marketed by Signal Electric Mfg. Company, Menominee, Mich.

Telescopic in design, it is adjustable to the wall thickness, 7 inches to 13 inches. No wood or metal frame or screws in the plaster, wood or brick are necessary. The inside and outside frames are polished cast aluminum, and the wall box is rust-resistant steel. Opening and closing of the door operates the motor and shutters simultaneously and the 10-inch silent blade fan is reported to remove cooking odors, smoke, steam and excessive heat efficiently. This Signal kitchen ventilator fan is available for A.C. or D.C., the A.C. type being non-radio interfering. Extending through the box from the four corners of the frame are four adjustable screws that hold the two sections permanently in place.

Door Stay and Holder
THE SHELBY Spring Hinge Company, Shelby, Ohio, has recently placed on the market a new door stay and holder designed especially for storm doors, but may be used on any interior door or hinged windows.

It controls the opening distance of a door or hinged window and prevents its opening beyond 90 degrees, but if the door is forced beyond 90 degrees the spring acts as a shock absorber. This stay operates also as a holder by means of friction made by the real brass shoe and angle slide plate working on the slotted rod.

This friction is adjustable by means of the wing nut which, when tightened, holds the door at any desired angle up to 90 degrees. It is easily installed on either right or left hand doors or hinged windows.
COMPARE this amazing new Mueller Oil-Fired Air Conditioning Furnace with any other heating plant you ever saw. You will agree, as did those who saw this new furnace at the International Heating and Ventilating Exposition at Chicago, that it is not only the most beautiful heating unit made today, but its new principle of heating is a sensation of furnace design.

Here are a few of the principles which place this new Mueller unit entirely apart from conventional furnaces: The radiator is the fan scroll... The air passes over heating surfaces not once, but three times, creating an unbelievable new rate of heat transfer. The unit consists of furnace, oil burner, filters, blower and controlled humidity, all enclosed in a beautiful, compact casing.

The basic design, covered by patents, secures a new standard of efficiency and reduced fuel cost revolutionary to home heating.

You will, of course, want all facts about this revolutionary Oil-Fired Air Conditioning Furnace. Write L. J. Mueller Furnace Co., Dept. AB-3 Milwaukee, Wis.

NOTE: Mueller-Milwaukee produces the most complete line of home heating equipment in the industry. Get the facts about new models of Gas Furnaces, Gas Boilers, Air Conditioning Units this year. And standard Mueller coal furnaces. Write for complete literature.
**MetaLane Alloy Weatherstrips**

A NEW metal alloy designed especially for use in the manufacture of weatherstrips has recently been announced by the Monarch Metal Weatherstrip Corporation, St. Louis, Mo. MetaLane, as this new alloy is named, is a combination of aluminum, used as a base to give it lightness, and other metals, added to give it hardness, resiliency and durability.

Following the development of this metal, a new design for weatherstrips was evolved to make use of its characteristics, which are stated as being: hard wearing and non-tarnishing, resistance to corrosion, and lubricated, easy sliding surfaces.

An important consideration in the new design was simplified installation. Fewer nails are used, being one of the features which allow application by the average carpenter of from 1½ to 2½ windows per hour. Illustration shows the new strip for double hung windows.

Tests made at Washington University, St. Louis, showed that the new weatherstrip reduced infiltration of air from 45,511 cubic feet per window every 24 hours to 3,931 cubic feet. Other tests in which a Monarch equipped window was raised and lowered 26,000 times revealed that the frictional wear could not be measured by accurate gauges. This was the equivalent to 73 years of average use in a home.

In line with the other changes, a new distribution plan has been set up under which the Monarch products will be sold by a large number of dealers for more intensive coverage instead of by exclusive dealers, as formerly.

**New Line of Concrete Mixers**

FEATURES announced by The Jaeger Machine Company, Columbus, Ohio, in its 1936 line of concrete mixers, are fast charging and discharge speeds; smoother operation due to machined steel drum tracks with ball bearing rollers and an average of 25 per cent more engine power; modern, compact, streamlined designs, including 2-wheel pneumatic tire mounting 3½S, 7S and 10S mixers.

For bridge building, curb and gutter and general construction work, the 2-wheel 10S and 7S Speed King models of the type pictured are said to be adaptable because of their end discharge design and ease of hauling and of placing on the job. Heavy 6- and 8-ply industrial pneumatic tires are used which, with Timken bearing axle, make it possible to trail these Speed Kings behind light trucks at speeds up to 35 miles an hour, it is stated.

Streamlined tilting mixers are offered in 3½S to 7S sizes, featuring the Jaeger patented “Dual Mix” drum with “V” bottom on all models, a pneumatic tired 3½S trailer, and a popular priced 5S size with 2-wheel trailer mounting and end discharge adapted for work in congested streets, backing up to cellar windows and foundations, and pouring with swinging spout.

Jaeger non-tilting units are being built in 7S to 56S sizes with machined steel drum track standard on all sizes. Skip Shaker Power Loaders and gate-type Shaker Batch Hoppers, with wider, special shape discharge chutes and “forced discharge” bucket action make possible higher speeds and increased production in spite of the dry, sticky mixes used today.

**Timken Markets Low Priced Burners**

COMPLETION of an additional line of burners and oil burners designed to sell at substantially lower prices has been reported by the Timken Silent Automatic Company, Detroit, Mich.

Both conversion and combination unit types of the new GC burners, as they will be known, are of unusual simplicity of design and construction. Moving parts have been reduced to a minimum for pressure-type burners.

**Victor 10-Inch In-Bilt Ventilator**

THE Victor Electric Products, Inc., of Cincinnati, Ohio, is marketing a convenient and efficient kitchen ventilator, with a 10-inch diameter fan and a powerful motor, said to quickly eliminate cooking odors and greasy fumes with a minimum consumption of current. The simplicity of construction and the ease and speed with which it can be installed—thereby cutting time and expense—are claimed to appeal to the contractor and builder. As shown in the illustration, the exhaust duct is a round, adjustable sleeve. This design makes the ventilator easily adaptable to walls of any type or thickness, in old or new homes. Weather-tightness of the shutter and its automatic operation—a pull on the chain starts the motor and releases the shutter at the same time—as well as one-shot lubrication and rust-proof finish are other features of design and construction.

SIDE view of 10-inch Victor showing adjustable sleeve to which fan is attached.
Here’s where you can make a **SUBSTANTIAL SAVING** without sacrificing one iota of quality

**SLOANE-BLABON** Linoflor was developed during the depression to fill the need for a floor-covering in between felt-base and inlaid linoleum. Today it is one of the most popular items in the Sloane-Blabon line.

To all intents and purposes Sloane-Blabon Linoflor is exactly the same as genuine inlaid linoleum. It has a genuine inlaid surface—durable and long-wearing. Patterns are of the same high-styled type found in the most expensive inlaids. The only difference is the back, which is cushioned felt-base, accounting for the moderate price.

Sloane-Blabon Linoflor enables you to cut costs without cutting quality. Let us send you the name of an authorized Sloane-Blabon contractor in your city who will furnish you with Linoflor samples and prices and who is equipped to produce guaranteed installations.

W. & J. Sloane, Selling Agents Division, 295 Fifth Avenue, New York, N. Y.

**Sloane-Blabon LINOFLOR**
New Ransome Mixers

RANSOME Concrete Machinery Company, Dunellen, N. J., has developed a new 1936 series of 7-S, 10-S and 14-S mixers, each size similar in design and construction to the one illustrated.

Each of these models is furnished either side or end discharge with mountings of either two or four wheels, furnished in steel, solid rubber or pneumatic rubber tired wheels, all wheels equipped with roller bearings. This new series of mixers is said to be compact in design, easily handled about the job and economical in operation.

VIEW of 1936 series Ransome mixer.

Milburn Paint Supply Spray Gun

THE Paint Spray Equipment Division of The Alexander Milburn Company, Baltimore, Md., has announced their entirely new Type MM paint spray gun. The gun is balanced like a pistol with coverage and shape controlled by turning two knurled nuts.

Every part touched by the paint is in the single unit detachable spray head which is made of drop forged bronze and machined with rifle-like precision and alignment. Entire unit has low center of gravity; gun handle and body are one piece, die cast aluminum alloy.

Standard air hose connection, located at the base of the handle, is designed for ease of handling and to prevent tangling of the air hose or obstructing adjustment controls. Atomizer head is of one piece, precision machined and concentrically centered on fluid nozzle. Direct and commodious air passages provide an abundant, free flowing air supply.

Other features are listed as two finger grip trigger conforming naturally to the shape of the fingers; fluid nozzle made of wear resisting steel with internal and external tapered seat; adjusting nut operating a non-corrosive needle valve to regulate air flow to the atomizer head.

Oil Burning Weather Control Units

THE Heater Division of Motor Wheel Corporation has announced a complete series of newly designed models in its automatic oil burning Weather Control unit line for 1936.

All models are completely self contained units and provide facilities for automatically heating, filtering, humidifying and positively circulating the conditioned warm air.

This year's models are furnished in two styles—a standard round casing unit with rear mounted blower and filter housing and with a special streamlined burner housing in front, and a de luxe model in keeping with the most modern trend in cabinet design.

The new weather control units are fired with the MW Emancipator pressure burner which is rubber mounted on the front of the furnace for quiet, vibrationless operation. Heating capacities range from 85,000 to 175,000 BTU output. The special MW prefabricated combustion chamber of a new pear-shape design is included as standard equipment and is said to result in a much higher efficiency rating from the burner. A large hinged door in the front panel of the de luxe casing gives ready access to the burner and the inspection door which also has a visible glass observation port.

Other features and equipment include a new type automatic humidifier, filters and blower, double casing in both the standard and de luxe models, heavy seven gauge steel welded and riveted heat drum, heavy gauge U-shaped radiator or Economizer, complete low voltage controls with choice of either Mercoid or Minneapolis-Honeywell.

Drive Screw Roofing Nail

THE Deniston Company, Chicago, is now making a plain drive screw roofing nail, which features the nail blank carefully made with a circular head in which the shank is exactly centered; thread of the screw, deep and well cut to give positive turning action; edges of the thread, clean and sharp to give a strong grip.

The maximum practicable angularity or pitch is given to the thread. The fact that the thread is rolled after galvanizing on galvanized nails is said to insure that the threads will not fill up with zinc nor are there lumps of zinc to roughen the surface of the nail and tear the fibre of the wood when driven.

All nails are full gauge. They are made in two gauges, Nos. 10 and 11, in standard lengths of 3/4 inches to 2 1/2 inches, the quantities per pound running from 280 to 115, depending upon gauge and length.

American Builder, March 1936.
HELP SELL THESE GROSS-MORTON HOMES

at Bayside Hills Development

Armstrong’s Linoleum was used in kitchens at the Gross-Morton Corporation’s Bayside Hills development of 1000 homes. Pattern is Embossed Inlaid No. 8460 in black, red, gold, gray, and green.

N 1,000 new homes at Gross-Morton’s huge Bayside Hills development, the kitchen floors are Armstrong’s Linoleum. Here’s why “America’s largest home builders” chose Armstrong’s.

First, the Gross-Morton Corporation wanted a floor that was inexpensive to install and long wearing. Second, they wanted a floor that was cheerful and attractive yet easy to maintain—a floor that prospective buyers would like. Third, they wanted the added sales-appeal that nationally advertised Armstrong’s Linoleum gives any property.

In your houses and apartments, Armstrong’s Linoleum offers the same advantages. Send ten cents now for “Floors That Keep Homes in Fashion”—a bookful of smart, inexpensive decorating ideas. Armstrong Cork Products Company, Floor Division, 1218 State Street, Lancaster, Pennsylvania.

Armstrong’s LINOLEUM FLOORS

Here’s a CHAMPION PROFIT-BUILDER!

Thousands of contractors have learned that Nu-Wood, the multi-purpose wall and ceiling covering, opens the way to bigger profits and more jobs. You, too, will find that owners like Nu-Wood on sight because it pleases both their desires and their pocketbooks.

Nu-Wood does FOUR jobs for the price of one—decorates, insulates, quiets noise and corrects faulty acoustics. Applied over old wall and ceiling surfaces, or used in new construction, it brings great beauty to any interior. Nu-Wood texture and colors are unique. Nu-Wood patterns—made possible by Nu-Wood’s many forms—are adaptable to any style of interior.

Use Nu-Wood for homes, theatres, churches, stores, offices, restaurants—public and private buildings of all kinds. Find out what Nu-Wood can do to increase YOUR profits—write today for complete information.

MAIL THIS COUPON

WOOD CONVERSION COMPANY
Room 119, First National Bank Bldg.
St. Paul, Minn.
I want to know more about Nu-Wood. Please send me, without obligation on my part, information and illustrations.

Name______________
Address____________
City______________ State____________
Real Estate Survey Shows Improvement in Prices, Rents, Building Volume

The Twenty-Sixth Semi-Annual Survey of the Real Estate Market, covering 275 cities, and made by the National Association of Real Estate Boards from confidential reports by its local member boards, reveals that there is a decided upturn for real estate in every section of the country, with earning power of existing buildings—index of real estate health—measurably rising.

Important trends are the dominance of the factor of favorable mortgage supply as affecting the amount of new home building. People who are ready to build a house can in many communities get a mortgage loan at interest costs perhaps one per cent lower than last year, and on terms that enable them to take advantage of land prices before they rise further. In these communities new roofs are rising by the fifties, even the hundreds. Many communities still report that only the borrower who needs no more than a 50 per cent loan finds any financing source open.

There are wide variations in degree of real estate's recovery as between communities where distressed properties have been dumped and those where the market has had orderly management.

Principal Market Elements

The following are the principal elements of the market as shown in the 275 cities:

1. Real estate is selling at prices higher than a year ago in 60 per cent of the cities of the country. The rise has reached 82 per cent of the very largest cities.
2. Turnover is more rapid than a year ago in 91 per cent of all cities over the 100,000 population mark, and in 85 per cent of all cities surveyed, great and small.
3. Shortage of single-family dwellings exists in two out of every three cities reporting.
4. Rents—index of how close we are getting to an appreciable volume of new construction—are coming out of the subcellar. For apartments they are up 10 per cent over last year in 83 per cent of cities, and up 15 per cent in one-third of the cities. They are rising in 76 per cent of all cities surveyed. But apartment rates, even in major cities, are still less than 60 per cent of the level prevailing in 1929.
5. Detached houses, even more generally than apartment, show that rents have risen. They went up 10 per cent or more in 83 per cent of the cities and are up 15 per cent in one out of every three cities. They are now within 20 per cent of the 1929 level. Central business property is leasing at higher rates than a year ago in 54 per cent of the cities, the first time in ten years that of December, 1924—that is to say the first in ten years—in which a majority of cities show this trend.

Shortage Grows in Apartment Space

The shortage of single-family dwellings shown in 66 per cent of the cities reporting is the most significant fact in the immediate outlook for new construction, and one of the basic factors of the whole recovery situation. But apartment buildings have shown the most general change in space absorption. Actual shortage of apartment units is now reported by 43 per cent of these cities, whereas only 29 per cent so reported six months ago.

Only two per cent of cities still show overbuilding in single-family houses. But shortage here is not more general than was reported six months ago, when it was shown in 69 per cent of cities. At least one city states new building has already eased the shortage. Shortage both of houses and of apartments has come to be more general in cities under rather than in cities over the 500,000 population mark.

A small group of cities—nine per cent of those reporting—already show shortage of business property.

Most General Up Trend in Ten Years

Most striking new development shown by the survey is the fact that rents for business space in the central business districts—cold turkey measure of the judgment of individual firms in general business as to their own future—are up in 54 per cent of the cities replying. Only 22 per cent of cities showed an up trend of central business property rates a year ago. The present is the first semi-annual survey of the Association since that of December, 1924—that is to say the first in ten years—in which a majority of cities show this trend.

For outlying districts business property rents are still at last year's level in 70 per cent of cities replying, higher in only 27 per cent of cities.

Downtown office space is renting at approximately last year's rates in 75 per cent of the 275 cities, but has moved up in 23 per cent of them. In outlying districts the change is slower, with 83 per cent of cities showing last year's rate, only 13 per cent showing a gain.

For either business property space or office space only, two or four per cent of cities show any lower rate.

No city of over 200,000 population shows rents down for either central or outlying business property.

Subdivision Market

Market for home sites is more active than a year ago in 90 per cent of cities over 500,000 population, at about last year's level in ten per cent of these cities. Not a one reports a less active market. For the country as a whole the market in vacant subdivision lots is more active than last year in 46 per cent of cities reporting, about on last year's level in 47 per cent of the cities.

Money Supply: Interest Rates

How general is the completely changed condition in real estate money supply is shown by the fact that 67 per cent of cities now report capital seeking real estate mortgage investment whereas in only 21 per cent of cities are mortgage loans seeking capital. Well over a majority of cities in every geographical section show capital seeking loans, and under five per cent of cities of over 100,000 population show loans seeking capital.

The largest cities (over 500,000 population) still have the most general capital supply. In 91 per cent of them capital is seeking investment, whereas in none of them are loans seeking capital. Nine per cent show equilibrium of supply-demand.

More than 90 per cent of cities in every population group above the 100,000 mark show capital seeking mortgage loans rather than loans seeking capital.

Interest rates are falling in 47 per cent of the 275 cities, are steady in 50 per cent of the cities, are rising in only three per cent of the cities. More geographical variation is shown here than is shown by any other market factor measured in the survey. For example, in the East South Central section 100 per cent of cities show falling rates as against 24 per cent of Middle Atlantic cities, 67 per cent of cities in the Mountain section, and 42 per cent of Pacific section cities so reporting. A very dominant proportion of cities above the 100,000 population rank shows rates going down. Not one reports rates going up.

American Builder, March 1936.

NEWS of the MONTH

Building Activities and Meetings
OFFERS TEAMWORK
to BUILDERS

No matter whether you are building new homes or remodeling old ones;—whether you want air conditioning for just a few rooms or a group of buildings;—whether you want a direct or indirect system; Gar Wood offers you a comprehensive line of efficient systems, coupled with an intelligent planning and installation service.

Many leading builders find Gar Wood TEAMWORK the surest and simplest means of executing their oil heating and air conditioning plans. We would welcome the opportunity of explaining this service more fully to you. Write

Gar Wood INDUSTRIES, INC.
7924 Riopelle Street, Detroit, Mich.
Branches and Distributors in principal cities

Tempered-Aire. Heating and air conditioning equipment includes filters, blower, humidifier, furnace (with "Economizer") and integral oil burner. All units can be equipped with a water heating coil for use in winter. 5 sizes.

Model R. A compact, fire-tube steam or hot water heating boiler with an integral oil burner, using No. 3 oil. 5 sizes.

Indirect Air Conditioning Cabinet. Combined with the "R" boiler, it provides heating, humidifying, filtering and circulation of air. 6 sizes.

Model O Water Heater. Oil fired. Provides quick, convenient, less expensive supply of hot water for industrial buildings. 2 sizes.

Model K. Conversion oil burner. Extremely flexible due to system of triple range blowers and two motor speeds.

Model H. An efficient low cost unit, to supply automatic heat for small homes. Handles up to 625 sq. ft. radiation.

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That the FHA Plan appeals to persons of moderate income is evidenced by the fact that monthly payments on these mortgages range from $21 to $36 per month. On the basis of an expenditure of 20 per cent of the family budget for housing, these payments presuppose an annual income of from $1,200 to $2,200 for almost three-quarters of the families benefited by the FHA Plan.

Delco-Frigidaire Opens Eastern Office

Establishment of better housing standards is encouraging improved home construction and displacing "jerry" building. The home financing system has thus been placed in a sounder condition for the anticipated building activity with both buyers and lenders more adequately protected against the possibility of a disastrous mortgage collapse such as necessitated federal government intervention through the Home Owners' Loan Corporation.

Business transacted under the Housing Act reached a total of $340,080,202. Modernization loans to the amount of $254,070,729 have been insured, and interest stimulated to a point where more than $1,000,000,000 of modernization has resulted through other means of finance. Mortgages have been selected for appraisal amounting to $257,561,799, and mortgages on large scale housing projects amounting to $27,030,234 have been insured. (See Chart.)

Average Term and Amount of Loans

Further data on FHA activity shows the average range of loans in term and amount as follows:

The average mortgage accepted by the Federal Housing Administration extends for 16½ years for a principal amount of $4,030 which represents 70 per cent of the valuation of the property.

Seventy-three per cent of all FHA mortgages are for amounts of less than $5,000; mortgages on new construction are mostly for $4,000 to $5,000, while the average refinanced mortgage falls into the $3,000 to $4,000 group.

This difference is accounted for in part by the fact that mortgages on new construction represent a higher percentage of the property valuation than refinanced mortgages and that the period of years in which the mortgage is to be paid off is longer for new construction mortgages than for those refinanced.

As a consequence, the monthly payments for both new construction and refinanced mortgages are about the same. The man who builds a new house gets a 20-year mortgage and borrows up to 80 per cent of the value of his property, obligating himself for a monthly payment of about the same amount that a person who refinances the mortgage on an existing house pays under the FHA Single Mortgage Plan.

Building Volume Maintains Increase

Total construction volume for the first half of February amounted to $64,940,300 according to F. W. Dodge Corporation's report on 37 eastern states. Of this figure $13,797,000 was the result of modernization which maintains the substantial increase so far recorded over last year.

27 Eastern States

Residential ............... $13,797,700  $7,584,000  $16,616,800
Non-Residential ............ 29,249,800 14,419,000  30,612,800
Public Works and Utilities 21,895,800 17,218,500 27,817,500

Total .................... $64,943,300  $39,221,500  $75,047,100

For January a total of $204,792,800 for all construction was reported. This compares with only $99,773,900 for January, 1935, but represented a decline of about 22 per cent from the total of $264,136,500 reported during December, 1935.

Improvement over January, 1935, totals was recorded in each of the 13 major geographic areas east of the Rockies without exception. The largest relative gains were registered in the Middle Atlantic states, the Chicago territory and Southern Michigan.

For residential building alone the Dodge organization reported a January, 1936, total of $37,439,300 as against only $22,410,200 for January, 1935, and $45,140,100 for December, 1935. Gains in residential building over reported totals of a year earlier were shown in each major geographic district, except the Southeast.

For non-residential building the January total for the 37 eastern states amounted to $90,479,800; this was almost three times the total of $32,958,400 shown for January, 1935, but was considerably below the December figure. The January, 1936, volume of heavy public works and utilities construction amounted to $76,873,500 and contrasts with only $44,405,300 for January, 1935, and $94,490,400 for December, 1935.
The DREADNAUGHT "8"

PRODUCT OF 20 YEARS OF SPECIALIZATION IN THE MANUFACTURE OF FLOOR SANDERS

The DREADNAUGHT 8 is years ahead in design and construction—built on a new principle that permits higher cutting speeds, greater ease of handling, higher sander efficiency with much less weight and bulk. Here is a machine, light enough to be easily taken from job to job without the use of a truck, that sands perfectly 600 to 2,000 sq. ft. of old varnished floor without clogging sandpaper; or 1,200 to 3,200 sq. ft. of new floor in 8 hours. It works right up to the quarter-round, is entirely dustless, uses from 1/3 to 1/2 less sandpaper—handles even the toughest jobs at lowest cost per sq. ft. and stands up under the most severe usage with outstanding dependability. These are FACTS, not merely claims—all backed by a bona-fide Guarantee that absolutely protects the purchaser.

If you are considering the purchase of a floor sander, by all means drop us a line requesting a free demonstration at once! This involves absolutely no obligation; and we feel certain when you see this machine in operation, note its sturdy, precision construction, you, too, like hundreds of other contractors will be thoroughly convinced that an investment in a DREADNAUGHT 8 will give you a great competitive advantage. Write today!

CLARKE SANDING MACHINE CO.
DEPT. A-336
MUSKEGON, MICHIGAN

FREE DEMONSTRATION ENTIRELY WITHOUT OBLIGATION
MAKE MODERNIZING AN INTEREST-BEARING INVESTMENT...USE GENUINE MASONITE PRODUCTS

Builders and architects everywhere are learning that Genuine Masonite Products in new or remodeled buildings create immediate interest with the buying and renting public. And they are discovering that these grainless boards achieve permanent, luxurious-looking effects at a fraction of the usual cost.

In bathrooms, for instance, tile-like walls, such as those pictured above, can be produced with Genuine Masonite TEMPRTILE...the grooved, hard board that can be cut with an ordinary saw and nailed into place by a regular carpenter. Properly applied, it will not chip or curl. And any color scheme may be procured by enameling it with standard preparations.

Masonite STRUCTURAL INSULATION combines beauty with extraordinary structural strength. It can be installed as sheathing, or for exposed wall and ceiling surfaces. It can be used in its natural warm-brown finish, or painted or papered. It is also a perfect base for plaster.

Masonite TEMPERED FREEDWOOD is a hard board, recommended for wainscotting, and for use with ultra-modern decorative devices.

Genuine Masonite Products can save you money from start to finish. Mail the coupon below for free samples and further information.

MASONITE CORPORATION, Dept. AB-3
111 W. Washington St., Chicago, Ill.
Please send me free sample and more details about
☐ TEMPRTILE ☐ STRUCTURAL INSULATION ☐ TEMPERED FREEDWOOD

American Builder, March 1936.

Alabastine Adds to Line and Staff

THE Alabastine Company of Grand Rapids, Mich., which since 1930 has expanded its line of wall-finish products, has now entered the field with a complete line of Alabastine oil paints, enamels, varnish and other paint specialties.

The entire Alabastine plant, consisting of three factories, and occupying a site covering 88 acres in and adjoining the city of Grand Rapids, has been completely modernized and renovated to improve production and greatly increase capacity. New machinery has been installed throughout, and the plant layout has been revamped to permit advanced line production at every stage of manufacture. New units can be added as needed without disturbing production.

"This modernization of plant and equipment makes it possible for our paint division to start with an initial capacity of at least 2,500 gallons per day," Mr. Corcoran, treasurer and general manager, stated, "and we expect to increase this gradually to a daily capacity of 8,000 to 10,000 gallons, placing us among the largest paint manufacturers in the United States."

W. H. Hall has been appointed director of sales of the Alabastine Company. He has resigned his position with the Glidden Company to assume active direction of the sales program for the new Alabastine line. Harry N. Jones has been appointed general superintendent of the Alabastine factory to supervise all production operations. Mr. Jones has had 33 years of experience as paint formulator and plant superintendent for various prominent paint manufacturers.

RFC to Buy Insured Mortgages

GOOD news for the building industry and for prospective home builders in the low income brackets was contained in the recent announcement by the Federal Housing Administrator of an arrangement made whereby the Reconstruction Finance Corporation Mortgage Company will purchase mortgages given for construction of new homes and insured by the Federal Housing Administration.

While financial institutions have heretofore found a ready market for insured mortgages, this arrangement is equivalent to the establishment of a national mortgage association or a mortgage discount bank and supplies to lending institutions an additional outlet for such of their insured mortgages as they wish to convert into cash.

One of the beneficial effects expected to result from this arrangement is that it will enable banks or other lending institutions to turn over several times the limited amount of money they are permitted to invest in mortgages. Particularly is this

(Continued to page 106)
Don't Pass Up Weatherstrip Work

Because You Lack These Tools!

Installing metal weatherstrips is profitable, and it is no more difficult than the work you do every day—if you have these Stanley Tools. They are the finest and most practical weatherstrip tools on the market.

Rabbet Plane No. 378 cuts the rabbets on sash "meeting rails" for the hook and flat strips.

Groove Plane No. 248 cuts grooves in the sash for the weatherstrip rib.

Door Rabbet Plane No. 78W rabbets the lock joint and the head of a door for weatherstrips. A detachable runner acts as a gauge for cutting rabbets 3/4" wide on either side without adjustment.

These three tools are recent developments by Stanley—The Tool Box of America— the source of fine tools for those whose income depends upon long service and full value from the tools they buy.

Descriptive Circular on request showing these and other Stanley Weatherstrip Tools

STANLEY TOOLS
New Britain, Conn.
FOR luxurious homes, or the simplest cottage, there are Weisway Cabinet Showers to answer the insistent demand for extra bathing facilities. They add living comfort and re-sale appeal far beyond the small investment required.

Easily, quickly, economically installed in space no larger than a clothes closet. Equally adapted to modernizing or new construction. Require no special treatment or settling of structure.

Weisway Cabinet Showers are guaranteed leakproof. Being independent units they are not affected by shrinking or settling of structure.

Complete Weisway line includes models for homes of every size, for clubs, hotels, institutions and industrial buildings. Nationally distributed through leading plumbers. Write now for complete information, without obligation.

HENRY WEIS MANUFACTURING CO., INC.
ESTABLISHED 1876
CABINET SHOWER DIVISION, 301 OAK ST., ELKHART, IND.

NOW!
AN EXTRA BATH
FOR HOMES OF
EVERY SIZE

SAFETY
FOOT-GRIP, NO-SLIP
FLOOR
Exclusive Weisway feature gives sure-footed comfort. Equally effective wet or dry. Entire receptor is vitreous porcelain on Armco iron, one piece, rustproof, non-absorbent, thoroughly sanitary.

NEWS
(Continued from page 104)
of advantage in localities and sections where the available funds for mortgage investment are limited.

With the entire resources of the Reconstruction Finance Corporation Mortgage Company solidly behind the Federal Housing Administration, the flow of new capital into the mortgage field in increased volume will result in giving home construction an added impetus.

gets orders for CCC Table Tops

A SIZABLE business in Masonite Tempered Preswood is reported as having been done last year by the Morgan Millwork Company of Baltimore through its lumber yards in several eastern and southern states by furnishing mess table tops to CCC Camps.

Based on its experience in one camp in Baltimore, the company sent letters soliciting similar business to all CCC Camps in its area, calling attention to the simple, inexpensive manner in which the mess tables could be erected. In many cases the pressed wood was laid over the old pine table tops, the result being a one-piece top, free from cracks or joints, waterproof, smooth, attractive in appearance, and sanitary.

The company quoted prices on standard sizes cut to fit, and inexperienced personnel at the camps was given the simple job of attaching them. Most purchases were made out of company funds.

F. D. PORTER, Building Paper Publisher, Dies

RED D. PORTER, Chicago publisher, died Feb. 14 while on a train en route to St. Louis from Tulsa, Okla., where he had been attending a real estate convention.

Mr. Porter was president of the Porter-Bede-Langtry Company, publishers of the National Real Estate Journal and Buildings and Building Management. He was a former president of the Chicago Trade Press and the Federation Trade Press Association. Mr. Porter was at one time publisher of National Builder, which, after a series of mergers, finally was acquired as part of American Builder.

Briggs Steps Up Production

DETOIT plants of the Plumbing Ware Division of the Briggs Manufacturing Company are operating on a 24-hour daily schedule with three shifts of workmen, according to a recent report. The division has been operating for several months with two shifts and just recently went to three in order to catch up with unfilled orders.

Manufacturing operations, which are centered largely in the company's Hamtramck plant, have been geared to the highest possible output as the result of mass production methods brought to the plumbing industry by Briggs.

Briggs has announced that Noland Company, Inc., of Newport News, Va., serving cities on the Atlantic Seaboard, and the W. A. Case and Son Mfg. Company of Buffalo with 21 branches located in south central and eastern territories, have been appointed wholesale distributors of Brigsteel Beautyware.

Organizes Stained Shingle Division

GEORGE EMSLIE has been transferred to the executive offices of the Weyerhaeuser Sales Company at St. Paul to manage sales of the company's Stained Shingle Division. Mr. Emslie has been active in the stained shingle industry for the past twelve years, and previous to his present appointment was eastern representative for the sales of Edham Shingles, a Weyerhaeuser forest product. Replacing Mr. Emslie in the East is Harlan P. Ross, Jr., who has been well known in the stained shingle field for ten years.

A feature of the sales and merchandising program behind the new Weyerhaeuser shingle is the Edham Finance Plan. Through this plan, the dealer is empowered to arrange loans for his customers to cover the cost of the shingles, plus application and all other costs incidental to the completed job. Briefly, upon ordering stained shingles, the dealer is issued a

American Builder, March 1936.
Get YOUR Share of New Work at a Profit!

HERE IS THE INFORMATION EVERY CARPENTER AND CONTRACTOR NEEDS to obtain your share of work under the New Housing and Modernization drive. Complete estimating and cost data on all classes of construction work that will enable you to estimate new work, remodeling or repair jobs quickly, easily and accurately.

Accurate Labor and Material Costs

This New Guide enables you to estimate labor and material quantities as accurately as is humanly possible, showing you just how all classes of work should be figured. Many new labor-saving tables help you do this.

All estimates are completely itemized, so that the contractor and estimator may insert local material prices and wage scales where necessary. This insures accurate estimates and permits you to make comparisons between estimated and actual costs.

New Methods and New Tools Cut Costs

Many new methods of handling your work are described that will enable you to increase your daily output. New labor-saving tools will help you cut your labor costs. They actually tell you just how much of a saving can be made over present methods.

The Books Must Prove Their Value to You—or Money Refunded

You take no chances in sending for these new books. Use them for 5 days on your own work or when preparing your own estimates. If they don't more than prove their worth to you, return them and the purchase price will be refunded at once.

FREE! The New Vest Pocket Estimator

The most popular little book contractors have ever used. Between its flexible covers you'll find 220 pages crammed full of up-to-the-minute estimating and cost data that you can use to big advantage in your business every day. Always in your pocket when you want it—for the job or in the office. We'll send The New Vest Pocket Estimator FREE with The Building Estimator's Reference Book.

Use This Coupon and Save $5

American Builder and Building Age, 30 Church Street, New York.

Enclosed please find $10 to cover cost of THE BUILDING ESTIMATOR'S REFERENCE BOOK, THE VEST-POCKET ESTIMATOR AND WALKER'S BOOKKEEPING AND INCOME TAX RECORD in accordance with your special offer.

NAME

ADDRESS

TOWN

STATE
The Paint "Eternal" Now Advertised Nationally

Starting in the Spring when drippy basements grate on nerves and, on through the Summer months, when glinting sunlight shows up the dingy drabness of stucco homes and buildings, these unusually effective ads will be selling Reardon's BONDEX Waterproof Paint to the millions who read Saturday Evening Post and Better Homes and Gardens. Every ad is packed with selling suggestions. Use them to get your share of this basement and stucco business.

Kimbell Heads Promotion Department

RICHARD G. KIMBELL has been placed in charge of the national trade promotion work of the National Lumber Manufacturers Association, under the title of Director of Technical Service. Mr. Kimbell has been in many years and will continue to be in charge of the Building Code Division of the Association, and has been in close touch with all departments of that Association. For the last several years he was stationed in the Chicago office, but otherwise has been at headquarters ever since he joined the Association.

H. R. Northup has been added to the staff and will have the special duty of assisting Mr. Kimbell in building code administration. Mr. Northup has served the Association in different capacities for a number of years.

Offers Architectural Scholarships

THE College of Fine Arts, Syracuse University, Syracuse, N. Y., is offering to freshmen students of architecture one $300.00 and four $150.00 scholarships to be granted by competition on Saturday, July 11. The competition will be in two fields—drawing and preparatory school record. (1) Contestants must send to the College of Fine Arts not later than Monday, July 6, a portfolio containing not more than 20 examples of their work in freehand and mechanical drawing, together with three letters of recommendation as to personality, character and general fitness. Judging the drawings by a committee of the Architecture Faculty will take place on Saturday, July 11. (2) The High School records of all contestants will be carefully examined by the Director of Admissions and the Architecture Faculty Committee to determine fitness for a course in Architecture. Special attention will be given to ability in high school mathematics.

Each portfolio of drawings, etc., must contain the name and address of the student contestant and a statement from the student's high school principal that the drawings, etc., in the portfolio are the original work of the student submitting them.

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Ruberoid Buys Mine, Adds to Plant

OWNERSHIP of the only operating chrysotile asbestos mine in the United States, located at Eden, Vt., and with asbestos deposits estimated at the current rate of production to last more than a hundred years, has been acquired by a subsidiary of The Ruberoid Company, manufacturers of asphalt and asbestos building and roofing products, through purchase of the assets of the Vermont Asbestos Corporation, the former owners. The property is now being operated under the name of the Vermont Production Company, Inc.

Another recent development is the construction now under way of an extension to its plant at Mobile, Ala., which will cost more than $200,000, and is a part of a general program of plant extension which has involved expenditures of approximately $1,000,000 in the past two years. Completion of the plant extension at Mobile is expected by July first.

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It is further reported that loans in excess of $2,000,000 to home owners located in virtually every section of the country have already been placed with the Ruberoid Purchase Corporation, recently organized to assist in the financing of needed repairs, replacements, and improvements in residential properties.

American Builder, March 1936.
TO BE SURE TO GET WHAT YOU WANT

When You Specify and Lay Maple Flooring

Countless performance records prove tough-fibred, tight-grained Northern Hard Maple to be the logical choice for the flooring of schools, stores, office buildings, homes, factories, mills, warehouses and similar buildings.

Combining comfort, beauty and remarkable service, use of standard grade Northern Hard Maple means a pleased customer and builds your reputation for laying floors that satisfy.

There is only one way, however, to be certain at all times of receiving these known qualities of MFMA standard Maple—and that is whenever you specify Maple flooring, to specify trade-marked "MFMA" Maple.

Maple Flooring trade-marked MFMA is guaranteed to be all Hard Maple of the grade stamped thereon. This mark also certifies standard quality and millwork, conforming in every respect to the high standards set by the Maple Flooring Manufacturers Association.

You invite substitution if you specify merely "Maple Flooring" when you want MFMA quality and MFMA supervision. You make sure of getting standard MFMA quality only when you specify trade-marked "MFMA" Maple—available in strips or blocks.

MAPLE FLOORING MANUFACTURERS ASSOCIATION
1781 McCormick Building, Chicago, Ill.

See our catalog data in Sweet's, Sec. 15/53. Let our service and research department assist you with your flooring problems. Write us.

Floor with Maple

The letters MFMA on Maple, Beech or Birch Flooring signify that the flooring is standardized and guaranteed by the Maple Flooring Manufacturers Association, whose members must attain and maintain the highest standards of manufacture and adhere to manufacturing and grading rules which economically conserve these remarkable woods. This trade-mark is for your protection. Look for it on the flooring you use.

YOU might have heard that around a building job back in the days when the Pilgrim Fathers were putting up houses in the days when the Pilgrim Fathers were putting up houses with one hand and fighting Indians with the other. But nowadays people don’t make nails on the job. Nor is there any reason for the long, slow job of fitting windows to frames on the job. That’s all done for you when you use the Curtis Silentite Window Unit—prefit at the factory as expertly as are the parts of your radio or automobile.

That means big savings even on a relatively small house. And it means better satisfied customers. Fewer call-backs for adjustments.

Silentite Windows help you build better houses, too. They’re truly modern insulated windows, saving up to 25% in fuel costs alone by their efficiency in keeping cold drafts out and warm air in. And they’ve won plenty of friends among housewives: dust can’t filter in, curtains stay cleaner, and Silentite Windows operate so smoothly and easily.

That’s because the sash slides freely in all metal-to-metal weather stripping of a new type which prevents jamming in humid weather or rattling in dry winter winds.

The Silentite unit, when installed, is truly a better window for less money. It costs less than a well weatherstripped ordinary frame and window.

Silentite is a window that’s mighty easy to install, and makes estimating easier and surer. It’s the one really big development in double-hung sash for the last 200 years. But why not let us send you the full story of these new windows? Then you can see all their advantages—to you and to your customers.

The coupon below is for your convenience.

Curtis Woodwork is available through the following distributors:

- Allen A. Wilkinson Lumber Co., Indianapolis, Ind.
- Rust Sash & Door Co., Kansas City, Mo.
- Mowbray-Merrill & Co., Des Moines, Iowa.
- Hallack & Howard Lumber Co., Denver, Colo.
- Campbell Cool Company, Atlanta, Ga.
- Jacksonville Sash & Door Co., Jacksonville, Fla.
- Curtis Companies Inc., Clinton, Iowa

Curtis Woodwork in Walnut

Curtis Companies Service Bureau
Dept. 505 Curtis Building, Clinton, Iowa

Please send me complete information on Curtis Silentite, the "insulated" window.

Name...........................................

Address...........................................

City...........................................

State...........................................
DURABLE. SAFE, ACCURATE.

6 powerful sizes --

Cuts wood, metals, more sawing applications. Made in metal, stone and compositions. Made in durable.

SKILSAW SAVINGS WILL BRING THE JOB TO YOU!

The architect's plan will become a job on YOUR books... if your bid reflects the savings that SKILSAW can bring. And, often, these savings can pay for SKILSAW on the very first job! SKILSAW is the leading portable electric handsaw because it has more power, more refinements, more-sawing applications. Cuts wood, metal, stone and compositions. Made in durable.

SKILSAW will pay for itself on the FIRST JOB!

More SKILSAW savings in construction work:

- Rips a two-inch plank, 12 ft. long, in only 40 seconds.
- On forms, cuts out 32 panels 16 x 2 ft. (two ends cut, one length ripped and pocket cut) in only 1 hour.
- Cuts out a 16-step stair stringer, from 2 in. rough, in only 10 minutes.
- Bevels thirty 2 x 4 in. rafters 50° in only 3½ minutes.
- Rips 60 ft. of 2 in. old maple flooring in only 10 minutes.
- Makes fire cuts on eighty-four 2 x 14 in. joists (both ends) in only 30 minutes.
- Completely trims a door, ready for hanging in only 7 minutes.
- Cuts 15,000 ft. of tongue and groove roofing in 2 hours 40 minutes.

Here's how SKILSAW saves in construction work:

SKILSAW, Inc. • 3314 Elston Avenue, CHICAGO

DRILLS - GRINDERS - BUFFERS - SANDERS - BLOWERS

1936 Better Homes Campaign Under Way

WITH the printing of the 1936 Campaign Guidebook for Better Homes in America, Miss Isabel Hodgkins, assistant administrator in charge of the campaign, stated that the fifteenth annual drive for community improvement is actively under way. The Guidebook is being mailed to some 5,000 Better Homes chairmen throughout the United States from the Better Homes in America headquarters, which were moved last year from New York to Purdue University, West Lafayette, Indiana. The booklet forms the basis of organized effort throughout the country to help people improve their homes and their communities. The campaign culminates in Better Homes week, April 26 to May 2.

The campaign for 1936 stresses the idea of improving and modernizing the entire residential block rather than isolated houses.

Trane Makes Changes

NORBERT D. DOWNEY, for many years the advertising manager of The Trane Company, La Crosse, Wis., heating and air-conditioning equipment manufacturers, took complete charge of that company's Unit Heater and Gas-Fired Heater Department, sales and merchandising on Feb. 1.

Mr. Downey's broad experience in the marketing of heating equipment makes him well able to render excellent service to the trade in his new capacity and plans are already under development to include additional sales, engineering and merchandising information.

Succeeding Mr. Downey as advertising manager is Mr. L. A. Trumble who rejoined The Trane Company organization two years ago after having previously been their advertising manager for many years.

The Rural Building Market

EXCITEMENT ran high when screaming newspaper headlines announced the Supreme Court decision against AAA. Subsequent news stories and editorials have so frequently been colored by political bias that manufacturers of products sold in farm markets have been confused. Some have expressed concern as to the effect of this decision on their 1936 sales. In order to clarify the situation, American Builder contacted agricultural leaders, publishers, and market authorities to get their candid views.

Most of the men who made statements prefer not to be quoted. Their views range all the way from an opinion that cancellation "will be disastrous to agriculture unless effective legislation is enacted to replace these provisions," up to the prediction that "invalidation will have no appreciable effect on the farm market."

Study of the situation as reported by agricultural leaders indicates that: with the exception of dairy interests, the AAA helped farmers and increased farm purchasing power; farm leaders want and expect to have some replacement program that will help to control production and eliminate price-devastating surpluses; farm purchasing power will be as great or greater in 1936 than it was in 1935.

Principal benefits of AAA, according to farm leaders came from higher prices of farm products, rather than from actual cash paid out by the Government. Payments aggregating more than $25,000,000 constituted only five per cent of the country's gross income during the last three years. "It was the difference between 8 and 10c corn and 60c corn," says a farm bureau president, between 35c wheat and 90c wheat; the difference between $2 and 10c in the purchasing power that he has exercised during the last year.

(Continued on page 112)
THE LUMBER YARD AND BUILDING-SUPPLY DEALER HAS MOVED TO Main Street

THE old-time "yards" and dingy office used to be "across the tracks," but today "building headquarters" are moving to Main Street. Yesterday's lumber yard or building-supply business is a regular department store today, handling a score of products. Its owners are doing a creative selling job that "old-timers" wouldn't have believed possible.

With a merchant's viewpoint and vision, the modern lumber and building-supply dealer has adopted the accepted standard of department-store operation—a National Cash Register System.

For with it, he has complete control over sales by departments and an easy, quick and accurate way to handle his "over-the-counter" and "cash-and-carry" business ... and, in addition, full protection on all transactions—C.O.D.s, charge and delivery, deferred payments, received on account, and paid-outs ... in fact, information which gives him complete control over his business—a control that shows him daily, and in a few minutes' time, the results of each day's activity.

Wouldn't you, too, like to have a National System which will give you such control? Ask a National representative to call and go over your store system. He knows store systems—that's his business. His time and service cost you nothing. It will pay you to his recommendations.

This has 16 totals. Totals in each of several departments; totals of four different kinds of transactions; and totals of individual clerk sales. It gives many other printed and untied records. It prints a one or two part receipt, certifies both copies of a duplicate sales slip. It is only one of a long line of cash registers and accounting-bookkeeping machines suitable to the modern "lumber store." One of those can be made to fit your particular business—exactly. GET ALL THE DETAILS.

The National Cash Register Co. DAYTON, OHIO

Cash Registers * Typewriting-Bookkeeping Machines * Posting Machines
* Bank-Bookkeeping Machines * Check-Writing and Signing Machines *
Analysis Machines * Posting Meter Machines * Correct Posture Chairs

In every good-sized town there are at least 100 garages per square mile with doors in bad shape. They can be remodeled with "Over-the-Top" Door Equipment at little more cost than for new doors. The property will be increased many times more than the cost of the equipment and garages so equipped rent easier. Many builders have been making good money at this for some time—especially with the National Housing Act financing remodeling jobs. Your dealer carries the equipment—no need for you to invest except as needed. See him—or write us for information today.

"Over-the-Top" Door Equipment was the first and only device for "overhead" operation that didn't require special doors. A real saving.

There's a size for every opening and only 3/4" hand-comb is required above standard openings. No access tracks, no weights, pulleys, cables or chains.

"Over-the-Top" Door Equipment Women especially are so delighted with the effortless, quiet operation of this equipment that they tell others of it—one job sells another.

You can interest truck fleet owners in group installations at less cost. Never need servicing or adjusting.


Public garage doors can be remodeled without costly cutting or fitting for openings up to 18' wide by 12' high. Automatic electric opening if desired.
Farm leaders believe that price gains came through the elimination of surplus production, made possible by Government aid. On the other hand, a statistician of the administration-baiting Chicago Daily Tribune dug out figures to show that crops which did not receive Government subsidies and production control made greater price gains than "controlled" crops.

Farm leaders pointed out the need for a soil-conservation program and expressed the opinion that a replacement measure will be provided.

Edward A. O'Neal, president of the American Farm Bureau Federation, states, "I feel confident that we are going to obtain a satisfactory program to replace the invalidated provisions of AAA."

The head of a large organization in the dairy field says, "It is my feeling that unless something is done immediately to replace to a certain extent the value of AAA to most farmers, we will be affected, indirectly at least."

Because of the Government program and drought, agriculture in general has neither livestock nor crop surplus, and a new program is expected to be in effect before a surplus that will reduce farm income can be produced.

Fred Bohen, of Successful Farming, says, "Spendable farm income stands now at the highest point since 1929, and further increases are predicted for 1936."

An agricultural economist states, "With a general pick-up in business and with the increased purchasing power of farmers which we have had during the past year, it would appear that business might continue on a good level throughout the coming season."

A Grange official, who asked not to be quoted, expresses doubt that "killing of the three A's will make very much difference in the purchasing power of agriculture this year. . . . I look for as good a year in 1936 as we had in 1935."

Floyd Keepers, managing editor of The Prairie Farmer, states, "Farm buying power probably will be higher in the next six to nine months than it was in the corresponding period in 1935. . . . Most burdensome surpluses have been disposed of and until new ones are built up, farmers should enjoy good prices and consequently continue the improvements they have planned for their farmsteads."

Hoard's Dairyman says, "Even those who are active proponents of the Agricultural Adjustment Act state that they do not anticipate any reduction in prices during the current year."

Earl C. Smith, president Illinois Agricultural Association, indicates importance of the farm market: "As compared with 1933, registrations of new passenger cars increased nearly 219 per cent in rural states in 1935. In industrial states they increased only 102 per cent. It should be clear that this great buying and consuming power had its origin in the increase of nearly $3,000,000,-

000 in the farmers' share of the gross national income."

Roger Babson, in his review of 1935 and forecast for 1936, says, "Farm regions appear to me as the best selling territories. They have been the most favorable sales areas for the past eighteen months."

From the foregoing summary of opinions two conclusions can be drawn: first, that business should not work against a farm program that stresses soil conservation and will help balance supply with effective demand in domestic and foreign markets; second, that manufacturers whose products are sold in rural markets can expect continued improvement during 1936.
This new machine and process completely solves the problem of permanently surfacing new or resurfacing old masonry buildings, walls, etc. It fuses a prepared waterproofed plastic mixture on any masonry surface. It fills all cracks and checks and can be applied in any thickness desired and in 30 colors and shades. Fully proven by over ten years actual use under all conditions and every climate.

LARGE WAITING MARKET

Owners everywhere want to enhance present values and make their masonry buildings more attractive and livable. The better builders are striving for greater permanence, beauty and salability in their new construction. With Colorcrete stucco spraying, you can supply this waiting market and can offer permanent, colorful surfacing at amazingly low cost. Many operators report costs of 2¢ or 3¢ per sq. ft. and sell at from 4¢ to 7¢. Some have paid for their equipment from first couple of jobs. Machine capacity over 800 sq. ft. per hour. Equip yourself now to cash in on this big waiting market and the big government modernization campaign opening up still greater possibilities for you.

Get the facts. The new Colorcrete books tell the whole story. Write today. It may mean business independence for you.

COLORCRETE INDUSTRIES, Inc.
505 Ottawa Avenue
Holland, Mich.

This Exclusive "SEAL-TITE" Feature

— makes RO-WAY Doors easier to sell and easier to operate

Investigate the extra value and service the patented "Seal-Tite" feature gives to every Ro-Way Garage Door. A simple gravity operated cam (Fig. B) instantly frees the lower section of the Ro-Way Door in opening, and just as effectively seals it draft-tight in closing. This trouble-proof mechanical hand never fails. It takes away 90% of the usual "drag"... gives unequalled ease in opening... lightens the "spring load" and pleases the user.

16 DIFFERENT TYPES

For Commercial and Residential Use

with headroom requirements of 8 1/2 to 21 in. All standard sizes, as well as special sizes and heavy duty doors with special heavy tracking are available. Ask especially about the Ro-Way low priced doors for residence garages, and the specially designed torsion spring high lift doors for use in public service stations.

Write for Complete Catalog-Folder

ROWE MANUFACTURING CO.
726 Holton Street, Galesburg, III., U. S. A.
EDWARDS Loxseam ROOFING

Easier to Sell and to Install

Beat competition by bidding on Edwards Loxseam Roofing and the job is yours! The customer can see that you are offering a better roof, tight as a drum from ridge to gutter, handsome in appearance and good for the life of the building, at a substantial saving in cost.

You can be low bidder and still make your full profit on material and labor because Loxseam is so much easier to install, on new construction or over old roofing. Sheets interlock full length with watertight seal, as fast as you can nail and lock them together.

Send roof measurements for estimate. Write for Loxseam Circular and General Catalog No. 88.

THE EDWARDS MANUFACTURING CO.
542-562 Eggleston Ave.
Cincinnati, Ohio

FROM JOB TO JOB

• AT 50 MILES AN HOUR

LOOK! Here's a new Mixer that you can wheel along as fast as you can drive. It's the New Wonder 3/4—pneumatic tired with Timken Bearings and spring mounted for fast, quiet trailing. Or, available on cushion solid tires if preferred.

The Mixer itself has been wonderfully improved. It has all the features which have won top rank for C.M.C. Mixers on jobs during the past year.

A COMPLETE LINE OF MODERNIZED EQUIPMENT

Write for bulletins on C.M.C. Mixers—all sizes—pneumatic tired concrete Hoes, Pumps, Sew Rigs, Wheelbarrows. Don't buy before getting our prices. No obligation.

CONSTRUCTION MACHINERY COMPANY
Dept. AB
WATERLOO, IOWA

LETTERS from Readers on All Subjects

Facts, opinions and advice welcomed here

Perhaps Designs are Sound Also

Minneapolis, Minn.

To the Editor:

It seems that I neglected to renew my subscription to your monthly effort. I am enclosing a check for a two year subscription. You might also send your latest edition of "New Era Home Designs and Modernization Plans." Why you should apply such a misleading title to a booklet that holds many a 1918 home is beyond me, but I am eternally hopeful of discovering a few suitable designs from the conglomeration.

I am very much in favor of the editorials by Samuel O. Dunn. They will do much to restore sanity to the many crack pots among the building tribe as well as any others who happen to read them.

ARVID E. CARLSON AND SONS
Contractors & Builders
By Evert A. Carlson

Proposes Home Building Expenditures
Be Made Income Tax Deductible

Trenton, N. J.

To the Editor:

Has it ever occurred to you that the building industry, which has been subjected to government competition, could, if properly encouraged, do more in speeding up the wheels of industry and create more employment than any other industry? Few people realize that the construction industry consumes most all the natural products of the land; the mines, quarries and forests contribute the raw products that represent about 8 per cent of the final construction costs. These raw products must be transported and pass through many fabrication factories before reaching the finished stage and the other 92 per cent of the cost of construction is distributed over this vast scope in the form of wages, overhead and profits.

Considering these facts, don't you feel like writing to your influential friends, including in the group at least one United States Senator or Representative, in the hope that sufficient influence will be brought to bear on the administration to pass legislation rewarding a taxpayer who builds a new home or modernizes an old one, by exempting the cost of such work in his federal and state income tax returns.

C. EDW. MURRAY, JR., Vice Pres.,
Crescent Insulated Wire & Cable Co.

Thanks; But We Haven't Missed a Monthly Issue in 58 Years

Owensboro, Ky.

To the Editor:

Several years ago I read your magazine regularly until you discontinued publication and I am just now starting to read it again. Your January issue is the first one that I have seen and I take this opportunity to congratulate you on the improvements made. It certainly is the "tops" in that line of magazine.

I am planning to build several moderate priced homes in the spring and would like to receive several of the Catalogs listed on the coupon. Also, I would like to have the key to the cost prices listed with some of the homes you have in your magazine.

S. E. MOSLEY.

(Continued to page 116)
JUST A PEEK AT THIS NEW "CONTRACTOR SPECIAL"

NEW — PORTER-CABLE — EIGHT FLOOR SANDING MACHINE

The sander that dares to be different in order to give you the highest production at the lowest cost on every bit of your floor work.

YEARS AHEAD IN POWER — PERFORMANCE — DESIGN

NEW MOTOR, packed with power . . . NEW BEARINGS, lubricated for life . . . NEW DRUM, with selective speeds . . . NEW double purpose DUST SYSTEM . . . NEW streamline DESIGN.

For the sake of your own profits see this CONTRACTOR SPECIAL before buying any floor Sander.

Write for a demonstration without obligation

The PORTER-CABLE MACHINE COMPANY
1721-3 N. Salina St., Syracuse, N. Y.

The Building Cost Calculator

By J. R. Smith, Architect

By using tables giving costs of all materials and labor for all types of construction, on the basis of the decimal system of measurement, the author says that estimating costs can be reduced 75%. His book contains 150 tables showing material and labor costs at any material price and wage scale. The Material Cost Tables give the cost at a glance, per unit of materials in place, with all waste and extras included. The Labor Cost Tables give the cost of the labor required for placing a unit of the different materials, at any wage scale.

Surface areas are measured in squares of 100 square feet. Linear measurement is based upon units of 100 linear feet, and cubic measurement upon units of 100 cubic feet. When areas are once determined it is unnecessary to recalculate for the different materials entering into the construction, as all materials and labor costs are based upon the same units of measurement.

For the convenience of the estimator the book is divided into sections covering the different types of construction and materials, with each section multi-graphed on different colored paper. Estimating blanks listing all materials and labor within each section, with marginal reference to the different tables, are provided. With a summary sheet listing the totals of each section and all additional charges that should be included, oversight or omission of important items is prevented.

1934. 168 Pages, Tables, 8½ x 11 Inches
Imitation Leather, $10.00

Money Back if Not Satisfied

Book Service Department
AMERICAN BUILDER AND BUILDING AGE
30 Church Street New York, N. Y.

HOW TO GET MORE MODERNIZING CONTRACTS

USE THE 1936 WEATHERBEST Sales & Service PLAN

A Proven Plan that locates the business—and turns it into money in the shortest possible time. Make us prove it!

NATIONAL ADVERTISING—Five leading magazines regularly telling and selling advantages of genuine Red Cedar Shingles stained by WEATHERBEST—to home modernizing prospects and for new homes, too.

MOST EFFECTIVE LOCAL DEALER PLAN EVER OFFERED—House-to-house Community Surveys with colored photo-gravures for every prospect—displays—samples—beautifully illustrated literature with winning examples.

WEATHERBEST CORPORATION
176 Main St., North Tonawanda, N. Y.

It will pay you to GET THE WHOLE STORY

Address

TYPICAL HOME INSTALLATION OF WRIGHT RUBBER TILE

Get This Double Profit Business
New or existing buildings are prospects for Wright Rubber Tile Floors. There is a profit in the sale and profit in the installation. Our Instruction Booklet has been instrumental in starting many men in a profitable business. Write for a copy today.

WRIGHT RUBBER PRODUCTS CO.
P. O. Box A-36, Racine, Wis.
Save Time and Money with a Speedmatic Saw

For absolutely guaranteed cutting speed and dependability in a saw — Speedmatic is the buy.

Its performance on wood, metal, stone, tile and compositions will actually amaze you.

It is different than ordinary electric hand saws in design — Research tip adjustment for depth and angle cuts — balanced for one-hand operation — quick blade change — automatic guards — rust-proof finish — and a motor that stands up and takes a tremendous lot of punishment.

Save with a Speedmatic

"Ask us for a FREE copy of "Manual on the Use of Electric Hand Saws in House Building." It shows exactly how to save time and money. Write for details today."

The PORTER-CABLE MACHINE COMPANY
1721-3 N. Salina Street Syracuse, N. Y.

WINDOWS THAT STICK
Doors that warp
Wood that changes its shape and size
Wood that rots — because it absorbs moisture

Moisture is the friend and enemy of wood. A little is necessary for wood health. Too much is fatal.

"WOODLIFE" keeps normal moisture content in wood and prevents moisture absorption.

People who build houses want sash and doors that fit — and stay that way. If they know this condition is easily available they will INSIST on it.

Wood treated with "WOODLIFE" is moisture-proof; can be painted or enamelled; stays in shape and size; and does not rot. In brief the wood stays new.

WOODLIFE is easy to use and inexpensive. For manufacturers — in Drums; for wholesalers and builders — gallons and 5 gallons also.

Interesting facts upon request.

Protection Products Mfg. Co.
7440 Second Avenue
Detroit

American Builder, March 1936.

Letter Dept. (Continued from page 114)

Building Up Data Files

To the Editor:
Your interesting description of booklets covering different phases of building has attracted our attention. We are preparing a collection of material that might be helpful to our clients who expect to build this spring.

We would be grateful to you if you could send the pamphlets described.

THE PAUL E. STARK CO., Realtors,
By Rolf E. Darbo

"Will Get Back Some of the Lumber Business"

To the Editor:
We are very much interested in getting some good plan books. What we want is something new and would like different books showing both medium homes and cheap homes and garage apartments.

Your magazine has been tops on the homes you have shown each month. If you have incorporated them in book form we would like to have some of them.

Plan book people have been calling on us but all they do is gather up all the old stuff and add one new one and call it a plan book. The new colonial houses you have been showing are going to get back some of the lumber business. Our retail department is very enthusiastic about them.

KILPATRICK BROTHERS
Manufacturers and Jobbers of Hardwood Lumber,
Sash, Doors, Cabinets, Interior Trim
By John Kilpatrick

No-Dirt Fire Place

To the Editor:
When building a home a few years ago we wanted a fireplace, without the ashes on the floor. My husband drew the plans of his own idea and we built it. I have never seen one anywhere like it, and it is wonderful in saving dirt from floor.

MRS. EDITH BOYER

Working for Title I Extension

To the Editor:
You will perhaps recall the writer called on you at your office relative to Title One of the Federal Housing Act just before it became a law. Our experience with this portion of the Act has been very good, in fact we know that four-fifths of our remodeling business was financed through this measure last year, and we can see no reason why it should not be as effective this year if allowed to continue.

However, it is our understanding that there is a very good (Continued to page 118)
GAS-FIRED HOT WATER...completely automatic...dependable...ready day and night all year round...is one of the smartest things anyone can build into any house. Ask your gas company for the facts, or write...

AMERICAN GAS PRODUCTS CORPORATION
AMERICAN RADIATOR COMPANY
40 TREAT* NEW YORK

Just Published

CHECK LIST OF CONSTRUCTION MATERIALS and EQUIPMENT
By GEORGE W. SPAULDING
Superintendent of Construction

This new, condensed reference book is just what many contractors, designers, estimators, specification writers and material men have been looking for. It lists standard materials of all kinds, various work in all building trades, and construction equipment in a single handy volume. It does not contain cost data or advertising matter. Any estimate involving material lists should first be made up in the usual way. Then the applicable sections of this book can be checked through. A number of omissions, amounting to many times the cost of the Check-List, are very likely to be found.

CONTENTS
1935. 322 pages, 7x11½ inches, 43 index tabs, flexible cover, $7.00.

Money Back if Not Satisfactory

BOOK SERVICE DEPARTMENT
American Builder and Building Age
30 Church Street, New York, N. Y.

PORTABLE to the job
for bigger PROFITS

WHETHER it is a small remodeling job or a big operation, the GM Portable DeWalt saves time and earns an extra profit for you. Cuts off, rips, bevels, miters. Change from one operation to another requires only a few minutes time. Rigid frame insures accurate work.

De Walt's Cut
Wood • Metal
Stone • Brick

Write or send coupon for complete information!

A Dallas, Texas, contractor says: "Your machine has proved itself indispensable and has earned its original cost several times over."

Send me full information on DeWalt machines and how they will save me time and money on the job. I wish to use it for [ ] wood, [ ] brick, [ ] metal, [ ] stone.

Width... Thickness...

My power is: Volts... Cycles...

Name... Address...

City... State...

Every Builder Needs this Valuable Book

THE NEW, BIG 1936

ELKAY CATALOG
of STAINLESS STEEL

CABINET SINKS and TOPS
PANTRY and KITCHEN SINKS
SCULLERY SINKS
SHOWER BATH CABINETS

A valuable Catalog chock full of New ideas in modern Kitchen, Pantry, Laundry and Bathroom Equipment.

Send for Your Copy Today

ELKAY MANUFACTURING CO.
4705 Arlington Street, Chicago, Ill.
METAL WINDOW FRAMES
AIR-FLO Type, heavily galvanized metal frame, casing and ventilating wings, to take 4 light 9 x 12 wood sash—only $1.30. Four larger sizes up to $2.00 each.
A sensational new window. Provides ventilation without drafts—no rattling or sticking—rot proof. Simple to install, fits between stud- ding 24" on center. Use ordinary wood sash or special Clay Wood Sash with Ultra Violet Glass.
Ideal for farm buildings, barns, hog houses, poultry houses, sheds—for garages, cottages, tourist camps, warehouses and many other purposes.

DAIRY BARN WINDOWS
Heavy, solid section steel . . . $5.60 to $9.40. Open-Air Windows are furnished complete with sash frame and wings of heavy steel construction. Easy to adjust — provide ventilation without drafts. Write for information.

CLAY EQUIPMENT CORPORATION
Department AB-3
CEDAR FALLS, IOWA
Clay Stanchions, Stalls, Bowls, Ventilation—A complete line of Modern Barn Equipment.

TRY THEM ONCE
Then you be the judge and the jury.
WAPPAT ELECTRIC HAND SAWS will cut your costs. Let them show you how.

Many Exclusive Features

Four Sizes
2" to 4½"
Cutting Capacity

Please tell me more. Size...
Name...
Address...
City...

Letter Dept.
(Continued from page 116)

possibility that the banking interests will stifle this Act, and not allow it to come up for extension in this session of Congress. We consider this would be a calamity to the people in the building industry.

We are writing our congressman and senators, and felt that you, perhaps would have some suggestions to make relative to the best way to keep this Act in effect. We know that the building material and lumber dealers of this country would appreciate any effort that you would make, or any suggestions as to how to keep it functioning. We feel that if enough heat were turned on some of the various Lumber and Building Material Dealers' Associations, which are only half alive, they might perhaps commence to function in a way that might be worthwhile.

CENTURY LUMBER CO.
By Don Meenach

"Text-Book" for Vocational Schools
Long Beach, Calif.
To the Editor:
I herewith enclose a list of publications, as per your offer on page 72 of American Builder, December 1935 edition, which I desire to use in my trade classes as related technical information. Said classes are in cabinet making and carpentry. However, I touch on all phases of the building industry, and would appreciate any available information on up-to-date innovations in the building field.

May I express my appreciation of the good work you are doing and the great value your journal has been to me in teaching my trade classes. Our school has been taking the American Builder for at least twenty years to my knowledge, and I certainly enjoy it. It is worth more than you charge.

R. C. WILSON, President
Southern Section, California Vocational Federation; Polytechnic High School

Now in Every Issue
Mansfield, Ohio
To the Editor:
In passing allow me to suggest a page or so of kinks that this paper formerly carried in the back part. A fellow has a better way to hang a door, fit a drawer, short cut on framing or stair construction. Believe there are many who like these things.

C. C. CONSTANCE
Likes Catalog Service
Salt Lake City, Utah
To the Editor:
We find the suggestions in the catalogs furnished by manufacturers in your publication very helpful in giving our builders and home owners up-to-the-minute suggestions in new construction as well as repair work.

We would appreciate having the catalogs listed sent to us.
McFARLAND LUMBER & HARDWARE CO.
By C. Taylor Burton

Library of Plans for Customers' Service
Ballston Spa, N. Y.
To the Editor:
During the past few years we have been convinced that the free distribution of plan books is a waste of money with comparatively little return. We consider it far better to present your magazine to our contractor and carpenter customers, and to include subscriptions for six months or a year to many prospective home builders.

In addition to this service we are considering gathering a library consisting of two copies only of all or many of the desirable plan books published. Single copies to be kept in our office where prospective home builders may spend as much time as they wish in looking them over, and after making their
Estimating Building Costs
By WILLIAM ARTHUR
THIRD EDITION
Revised and Enlarged

This concise and handy volume has been specially prepared for the use of building tradesmen, contractors, material men, technical students, instructors and all others interested in the construction of dwellings, barns, stores, and industrial buildings of moderate cost.

It contains a collection of material data covering all classes of building construction and arranged for quick reference. There are ninety-one tables showing the actual number of hours of labor and quantities of material on work done. These examples are all worked out on the basis of $1.00 per hour for mechanics, and 60 cents per hour for laborers. The quantities are given and any change of rates can easily be adjusted by simple proportion.

LIST OF CHAPTERS:

239 Pages, 29 Illustrations, 4½ by 7 inches, Flexible Fabrikoid

PRICE $2.00 POSTPAID

AMERICAN BUILDER and BUILDING AGE
30 Church Street New York, N. Y.
In old homes or new, whether for renting or selling, "PERFECTION" BRAND Oak Floors give service and satisfaction. The greatest value for the money. Take advantage of the new Housing Administration and sell good Oak Floors on your modernizing jobs. "PERFECTION" BRAND Oak Flooring as furnished by your local dealer is carefully manufactured from selected timber, scientifically seasoned and kiln dried, easily finished. Ask your dealer today to show you the "PERFECTION" BRAND. Complete information is yours for the asking. Write us today. Sold only through retail lumber dealers.

ARKANSAS OAK FLOORING CO.
PINE BLUFF, ARKANSAS

"TAKE ME WITH YOU TO THE JOB!"

This modern, ball-bearing money-maker does the work of FIVE ordinary machines—eighteen or more of your everyday jobs—and does them faster; better. Portable? You can take it to any job—even through a 21 inch opening—by simply removing five bolts.

Cross-cutting Ripping Drilling Matching
Routing Planing Buffing Molding
Sanding Jointing Dadoing Tenoning
Plowing Rabbeting Grindings

AMERICAN SAW MILL MACHINERY CO.
61 Main Street, Hackettown, N. J.

The 20th Century Woodworker

Economical; efficient; invaluable for the spring pick-up—sash work, sills, window frames, screens, and so on. Write today for the attractive price and full details. Use the 20th Century Woodworker for

Snug Home in a Snowy Land

To the Editor:
Enclosed please find two snaps of my new home, completed last year.

The general plan was taken from your book "Modern Homes," page 31, and with some alterations from the plan given, we have what we feel to be a nice home.

The shutters will no doubt improve the looks and we are having them installed this spring.

AUBREY C. ATKINSON

Offers Free Space for Building Show

To the Editor:
We are a Building and Loan Association in a town of approximately 85,000 people who are more or less trying for good mortgage loans.

We find an absolutely dormant activity among the building industries of this community in the fostering of repair, modernization and construction efforts.

We, of course, would appreciate seeing activities stimulated in this town not only as an outlet of mortgage money but as a means to greater local employment.

We have a very fine office building well located in regard to near location of the center of town, and as to parking facilities. We have two very usable spaces in this building that are at present vacant, approximating in size some fifteen hundred square feet. We would like to put this space to constructive use until at least such time as it might be rented.

In examining your magazine, we note the great number of your advertisers who are apparently going to expensive means of carrying their message to the public and are quite interested in giving them more or less detailed explanation of their products. The writer wonders whether or not any of these advertisers might be interested in putting on demonstrations locally as to the use of their products. The thought I have in mind is that possibly we could furnish them this free space for the exhibition and that they undoubtedly have experts traveling the country in educational and missionary efforts who might be glad of the opportunity of using such a desirable location for a display of their products.

STREEVER LUMBER CO.
Lester V. Streever, President,
A fireplace makes a home more livable and adds charm and beauty. Peerless Dome Dampers assure successful operation of wood or coal burning fireplaces. You have three models to choose from—Rotary Control—Poker Control—Chain Control. Made in all standard sizes and built for lifetime service. Let us send you complete information on Fireplace Dampers and other Peerless building products.

Write us today
PEERLESS MANUFACTURING CORP.
1600 W. Ormsby Avenue
Louisville, Ky.

ONE COAT COVERS AND HIDES... for Walls and Ceilings
CUTS COSTS 25%

MURAL-TONE is the amazing new casein paint. Lithopone and real pigments in casein vehicle explain its revolutionary advantages. One gallon thinned with water gives one and two-thirds gallons of paint. Covers as much as 1,000 square feet. Velvet flat finish—washable. 10 soft pastel colors and a white that cannot yellow.

The speed, beauty and economy of MURAL-TONE amazes property owners, dealers and painters. A fraction of a day is all that's necessary for a perfect paint job.

Wide-spread advertising is telling this good news all over the country. Write today. Get complete facts. The makers of MURAL-TONE have been known since 1894 as sound, high quality people. MURAL-TONE is their answer to the crying need for a truly economical wall paint. Take advantage of this opportunity to make money—or to save money. Please address THE MURALO CO., INC., 568 Richmond Terrace, Staten Island, N.Y.

BETTER WHITE
BETTER LIGHT

MURAL-TONE
No Money-Saving Paint
in the Orange Can...

MURAL-TONE
MURALO PRODUCT

DRIVER Saws Quickly Earn Their Cost
In the Shop or On the Job

In these days of highly competitive figuring, the contractor with DRIVER POWER TOOL equipment enjoys a distinct advantage. Because DRIVER Tools save time they enable him to quote a lower price or make an extra profit.

Many exclusive features place this saw in a class by itself. The table size as shown is 31" x 21". The 10" blade rips and crosscuts full 3" stock. Table tilts to 45°. The mitre gauge is extremely accurate. The wood faced fence makes ripping accurate and easy. Another feature is the "nested" table insert. This comprises a small insert which is removed for dadoing inside a larger one removed for disc sanding.

Safety guard and splitter is standard equipment.

The DRIVER saw is a self-contained unit weighing 215 lbs. and may readily be transported to the job.

STUDEBAKER
Motor Trucks
SOUTH BEND, INDIANA

METRO MODEL
$595 and up, chassis at the factory

STANDARD MODEL
$565 and up, chassis at the factory

Ideal Transport for the Building Industry
More Light... Better Light  
with WILLIS SKYLIGHTS

Millions are being spent in "Better Light... Better Sight" education. Industrial plants will spend billions in 1936 in improved lighting. Willis Skylights utilize to the maximum degree the newest of all light... daylight ... and also provide the proper ventilation.

Write for Skylight Catalog
The WILLIS Manufacturing Co.
Galesburg, Illinois
"STANDARD for almost half a Century"

IF SISALKRAFT Will Do These
Tough Things Well, Just Think What it
Will Do In The Sidewalls of a House!

The wind and waterproof qualities of SISALKRAFT make it possible for you to wrap a home in a moistureproof and airproof blanket. Home owners deserve the complete protection that SISALKRAFT will give them. Why not show them samples of SISALKRAFT? Your lumber dealer will supply them.

THE SISALKRAFT CO.
205 West Wacker Drive
Chicago, Illinois

American Builder, March 1936.

How Gross-Morton Get Costs Down
(Continued from page 50)

Cash on Contract ........................................ $ 500
Cash on Title ............................................. 498
Federal Housing Administration 20-Year United States Government Insured Mort-
gage ............................................................ 3,992

Total ........................................................................ $4,990
MONTHLY CARRYING CHARGES
Mortgage Payment (includes interest and amortization, paying off entire mortgage in 20 yrs.)*................................. $29.72
Taxes (approximate) ........................................... 7.75
Insurance .......................................................... 40
Water ................................................................. 1.25

Total Monthly Cost .............................................. $39.12

*Mortgage can be paid off in less time if so desired.

BAYSIDE HILLS houses are substantially built, with 12-inch poured concrete foundations, western frame construction, 3 b 8 inch joists on 16 inch centers, slate roofs, three coat plaster jobs, double nailed bridging, first quality equipment and accessories. The following specifications give an accurate picture of the construction methods employed:

KITCHEN: Duco finish, efficiency kitchen dresser by Boro Wood Products Corp. Sink and work table top by Tracy Mfg. Co. Armstrong inlaid linoleum floor. Insulated gas range by Cleveland Operative Stove Co.


HARDWARE: McKinney hardware. Doors hung on loose pin butts; locks, knobs, latches and necessary hardware conform to architectural type.

FOUNDATION WALLS: After the earth under walls is tamped, lay concrete footings as per plans. Foundation walls 12" poured concrete well tamped when pouring. Universal Atlas Cement.

SILLS: Door and window sills brick, to have wash on top to shed water, except cellar sills which are set in concrete. Brickwork: Sound, hard burned Empire red brick. Exterior walls covered with 12 pound felt before brick is applied.

CHIMNEY: Provide T. C. flue as per plans. Lining is to be set in cement and run from bottom of chimney to top of cement cap.

IF SISALKRAFT STUCCO: All outside walls on metal lath. Apply first quality cement stucco in 3 coat work to make first class job.

PLASTERING: All walls, ceilings and partitions lathed with wood lath. Joints broken on studs only. All angles should be solidly formed before plastering. Plaster all walls and ceilings with 3 coats of Kings Windsor plastering. Brown coat floated down to a smooth even surface. Finishing of 3rd coat good, hard plaster paris finish. All angles sharp and well pointed. On all outside walls run a metal corner bead, properly secured from floor base to ceiling. On all interior corners run metal lath is applied.

TILE: Bathroom floor to be depth to receive concrete over a sunken floor before setting small ceramic tile in a floor of cement. Walls tiled with 4 x 4 U. S. Quarry Tile Co. colored tile. All wall tiles to be laid up in regular course.

FRAMING: Western framing. Floor joists 3" x 8" on 16" center.

SHEATHING: Cover all roofs with 7/8" x 6" N.C. Pine. Solid sheathing nailed to each bearing. Side walls of building to be sheathed with 7/8" N.C.P. sheathing, nailed tb every bearing.

OUTSIDE FINISH: All outside finish, including window trim, barge board, to be of good quality white pine and fir.

WINDOWS: Wood windows; sash to be caulked and weather-striped.

(Continued to page 124)
NEW! THE COMBINATION INSTRUMENT YOU'VE BEEN WAITING FOR

Model No. 38-b

Warren-Knight Transit-Level

Made for the contractor who appreciates good equipment.

10 Day Free Trial at our expense

This instrument gives you what you have always wanted in a low priced instrument—High power telescope—close focus—vertical arc with clamping and tangent—sensitive level—compass—plate level—protected circle—extra large shift—sturdy construction—low maintenance costs.

For complete details write for Bulletin F-13 to Warren-Knight Co.


Liberal allowance for your old instrument.

WANTED

Builder-Dealers to sell the new Monarch MetaLane Weatherstrip...new revolutionary discovery...new metal...new design...proved standard efficiency...low installed cost. Greatly increased demand.


MONARCH METAL WEATHERSTRIP CORP.
6333 Etzel Avenue
St. Louis, Missouri

DEALERS WANTED

Increase your profits by selling and installing TILE-TEX Resilient Floor Tile.

TILE-TEX is a high quality flooring made in many colors and sizes suitable for use in homes, public buildings, stores, etc. The only type of resilient flooring guaranteed to give satisfaction in basements. Easily installed by competent carpenters.

Write today for our free illustrated catalogue, layers' handbook, and dealer's proposition.

THE TILE-TEX COMPANY
1279 McKinley Avenue Chicago Heights, Illinois

SAVE SPACE
INCREASE YOUR STORAGE SPACE

Install FRAZIER self-balanced, disappearing attic stairs. These stairs are made of clear stock White Pine with fir panel in door. All hardware cold-rolled steel—no weights or pulleys. Nothing to get out of order. SELF BALANCED on exclusive FRAZIER feature. These stairs can be installed in 30 minutes after opening has been prepared in ceiling.

FRAZIER STAIR COMPANY
1817-19 BANKSVILLE AVE.
PITTSBURGH, PA.
**kwik-mix**


WRITE FOR LOW PRICE

KWIK-MIX CONCRETE MIXER CO.
PORT WASHINGTON . . . WISCONSIN

---

**how gross-morten get costs down**

(Continued from page 122)

**door frames:** To be 1½" thick for exterior doors, jamb rabbedted for door. Interior door frames 7¼" thick, with ½" stop planted on.

**roofing:** Slate roofs by North Bangor Slate Co. and Knickerbocker Slate Co.

**interior trim:** White pine, 1" x 2½" stool with 1" x 2½" apron and mould under. Jambs of windows rabbedted to sash and screen. All doors filled with hardwood saddles, base throughout to be 4" high with floor mould at floor. Picture mould in all chambers. Interior doors 1¾" thick, good quality iron panel for venner.

**finished floors:** All floors except kitchen good quality ¾" strip, oak clear white. All floors to be protected with heavy paper until house is completed. Finished floors to be scraped before painters finish same. Kitchen covered with Armstrong inlaid linoleum.

**closets:** Closets in chambers fitted with shelf and wooden rod to each closet. Linen closet to have four shelves.

**leaders and gutters:** Heavy duty gutters on heavy hangers. Run well up into shingles; run copper leaders where shown on plans with elbows, etc., leading on to cement platforms, secured with heavy hangers.

**flushing:** Chimney to be flashed, running well up into wall and counterflashings. Flash all places necessary with copper before applying shingles to roof. Flash timbers and frames where stucco is used, with gal. iron.

**heating:** First class steam heating outfit. Thatcher insulated steam boiler, Delco oil burner, cast iron radiators, complete set of fire irons. Cellar mains covered with asbestos cement. Guaranteed to provide 70 degrees in zero weather, without forcing boiler.

**plumbing:** All cast iron pipes and fittings sound, smooth, free from cracks, defects and of uniform thickness. No tar coated pipes to be used. Joints made with picked oakum and pure pig lead, bedded with caulking iron. No putty or cement joints. Supply pipes brass with fittings and screw couplings of brass. Branch, soil, waste and vent pipes galv. iron; bents of lead. Exposed pipes in bathroom chromium plated. Four-inch cast iron house drain to connect with sewer. Plumber to test plumbing pipes and repair all defects before plastering. Plumber to lay all pipes to sewer from house.

**house trap:** Trap outside drawn in with a cast iron running or half T trap placed where shown, with a handhole for cleaning covering with a brass screw top. Provide cast iron pipe connection to house drain of house trap.

**standing soil, waste and vent pipes:** Run all standing soil, waste and vent pipes, shown or necessary. Soil to extend out and above roof where it comes in connection with roof, to have sheet lead flashing, to extend under shingles and caulked in a hub of the pipe. All fixtures are to be trapped and vented.

**water supply:** Contractor to connect with water main on street on which the building fronts. Run a ¾" copper pipe continuing with ¾" brass pipe to boiler. From this take off necessary ¾" brass branches.

**painting:** All paint mixed with pure lead and linseed oil. All colors, stains, varnish and fillers standard quality. Cover all sap knots and defects in woodwork and shellac before priming. Putty all nail holes, cracks and defects after priming. Putty to match wood where same is finished natural. Outside doors and all other outside trim, stained and oiled or varnished. Timber, all exterior woodwork painted, or stained and oiled or varnished. All interior trim, 2 coats of lead and oil and one coat of enamel. Doors same as trim. Floors 2 coats of shellac.

**electric work:** All work to be done in the best manner and according to regulations of Fire Underwriters and a certificate secured at completion of work. BX concealed cable wiring to all outlets. All outlets to terminate with steel outlet boxes. Switch from first floor to cellar. Other switches marked on plans. Front door bells and rear door buzzer to ring in the kitchen. All base plugs 560 watts.

**iron work:** Brick openings to have angle irons as called for on plans. Provide lally columns of size and location as shown.

**shrubs, etc.:** Each plot seeded or sodded and suitable shrubs provided.
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USE LUCKE LEAK PROOF BATH TUB HANGERS
for a complete leak-proof seal along the edges of your tub. No
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POWER WOODWORKERS


201—Crescent Machinery for Small Shops—An illustrated handbook of 32 pages describing various portable, precision tools not only the complete line of Crescent power woodworkers, all completely detailed and indexed, but also discusses the organization of small shops and the profit-making lines that are being turned out by successful operators of such shops. Many valuable suggestions here for builders and cabinet makers; also for power shop men generally. — THE CRESCENT MACHINE CO., Leetonia, Ohio.

202—Oliver Woodworkers and Supplies —A pocket sized compendium of 320 pages covering all kinds of woodworking shop equipment, tools and supplies, including a popular line of benches, vises, clamps, etc., has been prepared by the OLIVER MACHINERY CO., Grand Rapids, Mich.

SAWS AND CUTTER HEADS

203—Huther Saws—Catalog No. 54 has been issued by Huther Bros. Saw Mfg. Co., Inc.—A pocket sized book of 116 pages showing a large assortment of circular saws, grooving saws and cutter heads for power woodworkers; also the saw dressing tools completing this line. How to set up special heads for special work is shown.—HUTHER BROS. SAW MFG. CO., Inc., Rochester, N. Y.

CONCRETE MIXERS

204—Half-Bag Tilters—The Rex mixer in the 7-1/4 and 10-1/4 sizes, rubber tired trailer models for builders’ quick, convenient haulage, are presented in a new bulletin from THE KNIKKERBOCKER CO., Inc., Milwaukee, Wis.

205—Knikkerbocker Mixers—The well known and old established line of Knikkerbocker concrete mixers, available in a range of sizes, is attractively presented in a new folder accurately illustrating these machines. — THE KNIKKER-BOCKER CO., Jackson, Mich.

206—Smith Improved Non-Tilt Mixers —Full details of the 7-S and 10-S sizes with all improved features are offered in a new Bulletin No. 159. All parts are clearly illustrated and complete mechanical specifications tabulated.—THE T. L. SMITH CO., 2835 N. 32nd St., Milwaukee, Wis.

IMPROVED TOOLS

207—Millers Falls and Goodell-Pratt Tools—The first consolidated catalog is a pocket sized compendium of 320 pages showing a large assortment of abrasives for floor sanding are carried in a unique sample card and price list showing 36 grades and styles ranging from fine to coarse. A valuable booklet, "Abrasive Papers & Cloths for the Student and Home Craftsman" is also being distributed. — MULLERS FALLS CO., Greenfield, Mass.

208—Bevil Devil and Its Products— "Artistic and Decorative Effects Produced with Insulation Board and Hard Board" is a bulletin prepared to show what can be done with the Bevil Devil wallboard-cutting tool perfected by KIMBALL MANUFACTURING CO., Inc., Royal Oak, Mich.

209—Abrasives—Behr-Manning quality abrasives for floor sanding are carried in a unique sample card and price list showing 36 grades and styles ranging from fine to coarse. A valuable booklet, "Abrasive Papers & Cloths for the Student and Home Craftsman" is also being distributed. It is a 30-page pocket sized manual. — BEHR-MANNING, Troy, N. Y.

HOME EQUIPMENT

210—Elkay Sturdibilt Metal Products —Stainless steel kitchen sinks, cabinet sinks and cabinet tops in a great variety of modern styles and designs have been assembled into an architectural file, fully illustrated and indexed, with work drawings showing construction and application. The Elkay unit type shower bath cabinet is also included in this collection. Catalog D, dated 1936, available from ELKAY MANUFACTURING CO., 4704 Arthington St., Chicago.

211—Stanley Closet Hardware — The Stanley shoe rack, clothes hanger bar, garment hook, pull-down hat holder and garment carrier, all designed to put order behind the closet door, are illustrated in a new folder from THE STANLEY WORKS, New Britain, Conn.

212—Stanley Door Hardware — "For Carefree Doors" is the title of an interesting little brochure of 32 pages bringing out some convincing points in regard to present day home hardware requirements. Front doors, back doors, garage doors, all are considered here.—THE STANLEY WORKS, New Britain, Conn.

213—Venetian Blind Hardware—New ideas in Venetian blinds equipped to operate from the top and providing new 4-way control are brought out in a new bulletin.—FIWALE EUCON MANUFACTURING CO., Inc., 64 Read Street, New York City.

214—Fireplaces in Corastone—An art portfolio of mantel and fireplace designs in "Corastone" designed and built by artists and shipped in sections to facilitate erection at the building is now ready for distribution to architects and building contractors.—DETROIT DECORATIVE SUPPLY CO., 4240 14th Ave., Detroit, Mich.

IMPROVED MATERIALS

215—Nu-Wood Interiors for Every Wall and Ceiling—A 32-page handbook in natural photography with insert in full colors illustrates many new decorative effects in tile, plank and wainscoting. Suggestions for the finish and decoration of many types of commercial rooms are given. Wall and ceiling tiled and paneled effects are startling in their beauty.—WOOD CONVERSION CO., St. Paul, Minn.

216—Thermex News—A periodical bulletin of information regarding Thermex fireproofing insulation and Absorbez acoustical corrective is now offered, together with a handy, stiff paper folder in which to preserve these bulletins on file.—THERMEX DIVISION, Northwest Magnesite Co., Pittsburgh, Pa.

217—Zonolite Loose Fill Insulation—"The Story of Golden Zonolite" is interestingly told in a well illustrated circular from F. E. SCHUNDALE AND CO., Inc., 45-15 Vernon Blvd., Long Island City, N. Y.

218—Non-Rusting Air Conditioning Ducts—A new folder bringing out the importance of cutting air conditioning costs through use of non-corrosive Toncan Iron has been prepared for general distribution by REPUBLIC STEEL CORP., Massillon, Ohio.
American Builder, March 1936.

BUILDING SPECIALTIES

219—Kinnear Rolling Doors—A new 32-page handbook illustrated with photographs and working drawings and giving complete mechanical specifications presents the extension line of Kinnear rolling doors and window shutters; together with garage doors and special doors for industrial plants.—THE KINNEAR MANUFACTURING CO., Columbus, Ohio.

220—Forced Draft Fans—A 12-page technical bulletin gives full information regarding the Sirocco line of fans for domestic heating plants. Other interesting information from the same concern covers the "Ventura Home Conditioner," a well engineered attic ventilating system; also regarding the "Sirocco Conditioner," a unit design to control the temperature, humidity, motion and cleanliness of air within the house both summer and winter in connection with any oil, gas or coal fired heating plant. All three from the AMERICAN BLOWER CORP., Detroit, Mich.

221—Duro Red Book—Catalog No. 35 covers shallow well pumps and systems, deep well pumps, power pumps, pressure tanks, cellar drainers, water softeners and water filters; the complete line of THE DURO COMPANY, Dayton, Ohio.

FARM BUILDING EQUIPMENT

222—Clay Barn Equipment—A library of farm building plans and information including general catalog of dairy barn equipment, ventilation book on the ventilation of barns, hog houses, poultry houses, stock water bowls, ventilating windows and Vita glass is available from the CLAY EQUIPMENT CORP., Cedar Falls, Ia.

OF SPECIAL INTEREST

230—Trimson Floor Sander—"Four Machines in One" are presented in a new specification folder of the new Trimson Time-Saver sander. It is used either with handle as a floor sander, or with handle detached as a bench sander with hand grips. A flexible shaft attachment is used for grinding, buffing, polishing, etc., in hard-to-get-at places.—TRIMSON MANUFACTURING CO., Cleveland, Ohio.

231—"Ideas for Building and Home Improvement"—Five ideas, interestingly presented, pertain to (1) good roofing, (2) asbestos cement siding, (3) mineral wool insulation, (4) Newtite wall panels, and (5) the Ruberoid finance plan. Strong sales values in this 16-page manual.—THE RUBEROID CO., New York City.

232—Expansion Bolts and Devices—"Architectural and Engineering Data on Expansion Bolts and Devices for Holding to Masonry" is a loose-leaf portfolio of charts, tables, data, specifications, etc.; various materials in which anchors are used and the proper type anchors for each.—THE RAWLPLUG CO., Inc., 98 Lafayette St., New York City.

233—Open Truss Steel Joists—A new 40-page handbook, Catalog No. E 70, details the Truscon open truss steel joists for modern fireproof building construction. The standard specifications for steel joists as adopted by the Steel Joist Institute are included. Numerous tables of sizes and strengths for various spans and a clear explanation of how to figure construction for safe loads make this a book of very practical value.—TRUSCON STEEL CO., Youngstown, Ohio.

234—Wire Nails and Other Wire Products—The Bethlehem Steel Co. has issued Catalog W-3, a 72-page pocket sized, spiral bound data book covering a complete line of wire nails and fasteners, fence and other wire and fence accessories. This book contains information often required.—BETHLEHEM STEEL CO., Bethlehem, Pa.

235—Allith-Prouty Garage Door Hardware—Information regarding the Allith-Prouty "Forty-Ninety" hardware for garage and other wide door openings is offered in a new circular.—AL-LITH-PROUTY MFG. CO., Danville, Ill.

236—Modern Woodwork—Huttig of Muscatine has put out a 16-page portfolio, in full color, illustrating its line of clear pine frames with aluminum primed joints, Red-E-Fit windows, inside and entrance doors, and kitchen cabinets.—HUTTIG MANUFACTURING CO., Muscatine, Iowa.

237—Stedman Rubber Flooring—New information regarding the Stedman line of rubber flooring and its advantages both in commercial structures and in home building is available from the manufacturers.—STEDMAN RUBBER FLOORING CO., South Braintree, Mass.

238—Electric Wall Heaters—Adams cheerful electric wall heaters for auxiliary heat in bathroom, bedroom and wherever occasional extra heat is desired are attractively presented in a new brochure.—ADAMS BROS. MANUFACTURING CO., Inc., Pittsburgh, Pa.

239—Indirect Illumination—Wide angle distribution and diffusion by ceiling reflection are featured in a new 16-page bulletin by the Edwin F. Guth Co. A wide assortment of styles of lighting fixtures, both for commercial and residential use, is shown.—EDWIN F. GUTH CO., St. Louis, Mo.

240—Leak Proof Tub Hangers—William B. Lucke, P. O. Box 130, Wilmette, Ill., has brought out a comprehensive handbook of 16 pages, fully illustrated and detailed, showing the why and how of the Lucke leak proof tub hanger. This is marked Catalog "D."

241—The Fireplace That Circulates Heat—The Heatilator Co., Syracuse, N. Y., has compiled a very satisfactory treatise on fireplace and flue construction, including also numerous suggestions for fireplace and mantel design, all with special reference to the improved Heatilator fireplace equipment which circulates heat at no added expense.

242—"Architectural Concrete"—An inspiring handbook of 36 pages in modern format and striking photographic illustrations presents a record of a number of outstanding public buildings recently constructed of concrete. Construction details and concise descriptive text add to the value of this portfolio.—PORTLAND CEMENT ASSN., Chicago, Ill.

243—Insulite Sheathing—An interesting consumer folder, "Between You and the Weather," calls attention to Insulite sheathing and Hardboard. "Home comfort must start with your walls" is the basic proposition developed in this folder.—THE INSULITE CO., Minneapolis, Minn.

American Builder, 105 W. Adams St., Chicago, Ill.

Please have the following Catalogs listed in this issue sent me—

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OCCUPATION*—

*Please note that occupation must be stated if full service is to be given.
Stair Framing Suggestions
(Continued from page 86)

at (e). Consequently, this method should not be used when the stringer (S) exceeds 4 feet in length.

When overloaded or when shrinkage occurs, the stair stringer tends to slip down at (e), thus causing a horizontal movement or slip at (f), which would have to be resisted by toe nailing at (f) and occasionally by the finished flooring at (t). (See Figure 6.) The upper tread at (a), Figure 5 is only 2 1/2" wide. This is bad practice, though often followed in speculative built houses. This narrow tread soon works loose and often tips when one steps near the nosing.

Figure 7. Figure 7 shows an improvement over Figure 5, by adding the nailing blocks (N) and doubling the header. The strength of this connection can be made about twice that of Figure 5, on account of the nailing block (N) and more end nailing surface on account of the added member (R). A slight movement at (e) would be resisted by the continuous toe block (T) at bottom. (See Figure 8.) The member (T) avoids a thrust against the finished flooring at (t). The construction shown in Figures 7 and 8 may be used for stringers having a length up to but not exceeding 8 feet, provided that the stringers are spaced about 16 inches o.c. Toe nailing at (f) should always be resorted to.

Effective Stringer Depth. The strength of the stringer depends entirely upon the effective depth (d). The following table will prove quite convenient when designing stairways. The net size referred to in the table refers to the net or effective depth at (d). The stringer “span” mentioned in the table shall be considered the clear horizontal run between supports, and not the inclined length.

<table>
<thead>
<tr>
<th>Net stair stringer size when stringers are spaced 2' o.c.</th>
<th>For span of 5 feet or less</th>
<th>2 x 4 or 2 x 6</th>
</tr>
</thead>
<tbody>
<tr>
<td>For span of 6 feet or less</td>
<td>2 x 4 or 2 x 6</td>
<td></td>
</tr>
<tr>
<td>For span of 7 feet or less</td>
<td>2 x 4 or 2 x 6</td>
<td></td>
</tr>
<tr>
<td>For span of 8 feet or less</td>
<td>3 x 6 or 2 x 8</td>
<td></td>
</tr>
<tr>
<td>For span of 9 feet or less</td>
<td>3 x 6 or 2 x 8</td>
<td></td>
</tr>
<tr>
<td>For span of 10 feet or less</td>
<td>4 x 6 or 2 x 9</td>
<td></td>
</tr>
<tr>
<td>For span of 11 feet or less</td>
<td>3 x 8 or 2 x 10</td>
<td></td>
</tr>
<tr>
<td>For span of 12 feet or less</td>
<td>3 x 8 or 2 x 10</td>
<td></td>
</tr>
</tbody>
</table>

The above table is based upon stairways requiring at least three stringers. Select Common Fir, (O.P.) or (Y.P.) or equal should be used. Better results, greater strength and less vibration will result when the stringers are spaced less than 2 feet o.c.

Cutting Costs with Power Saws
(Continued from page 46)

lot at one time. The rip cut is then made by cutting across the end to the maximum depth of the saw and finishing with a chisel.

Various types of jobs require various equipment and much can be said for both the hand power saw and the portable table saw or portable saw rig. There is a place for each. A number of manufacturers of hand power saws also provide a radial arm device that is very useful with a hand power saw for bench work. Such an attachment is especially valuable in handling long lengths. With the radial arm it is advisable to handle the pieces one at a time. The procedure is to set the bench stop the proper distance from the saw for the length of the joist. Then carry the joist from the pile and drop it on the outer end of the bench and against the side stop. Draw the saw across, squaring one end. Then slide the joist through against the bench stop and push the saw back, making the other cut. Thus in just a few minutes’ stop on the way from the pile of lumber to the building, the work of cutting the joists has been done. This is also true for studs, rafters, collar beams, etc., which will be discussed in a later article.