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THE BUILDERS' JOURNAL

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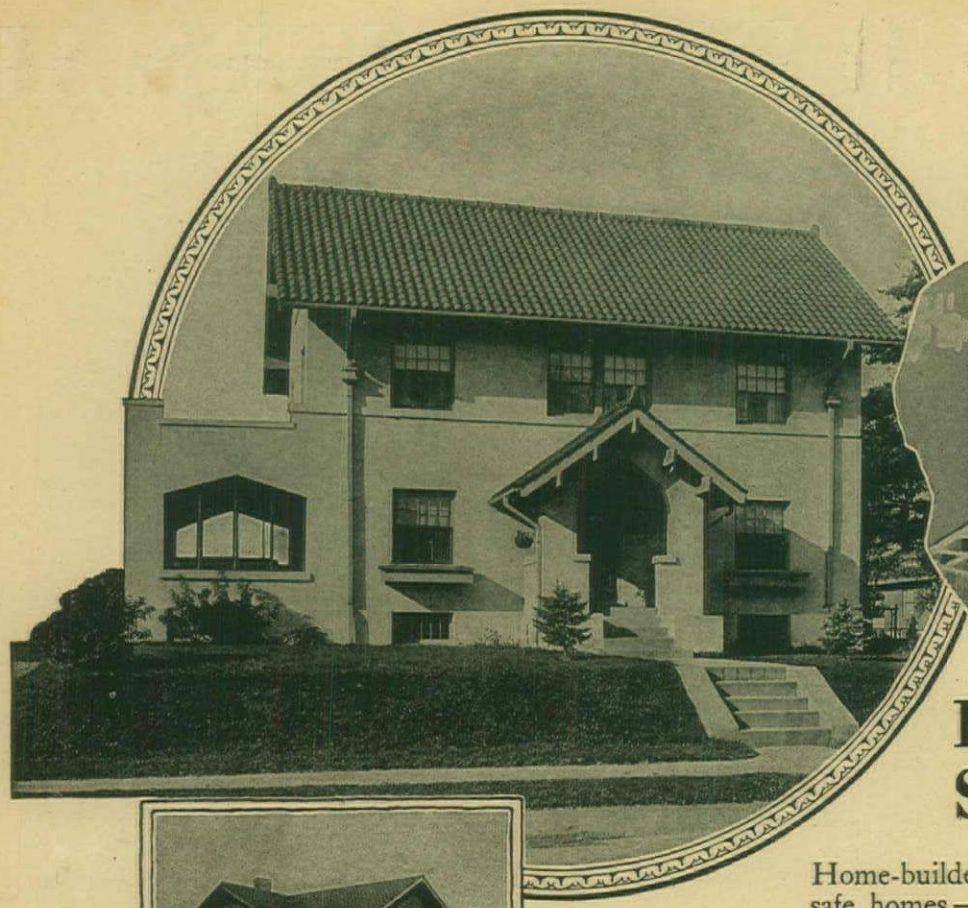

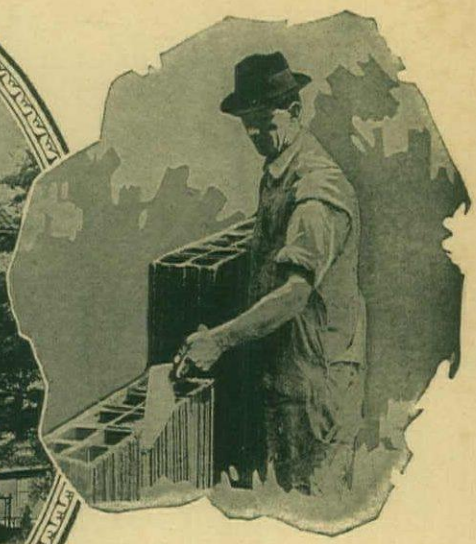

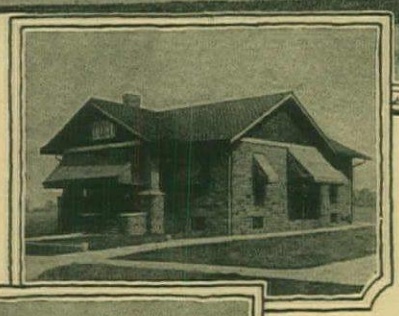

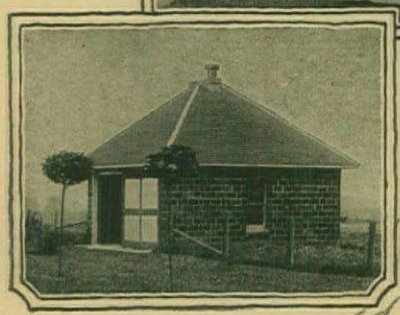

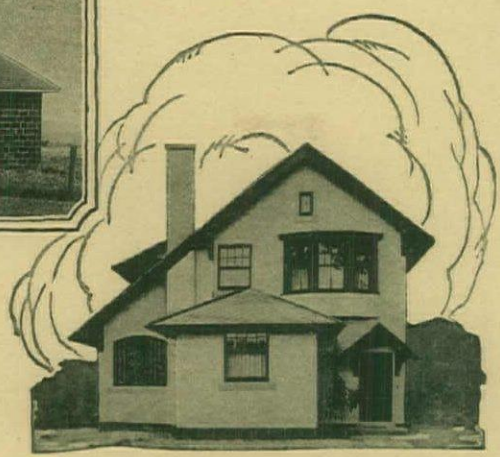

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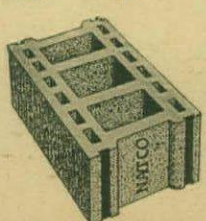

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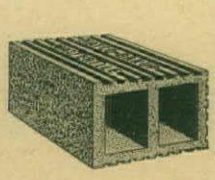
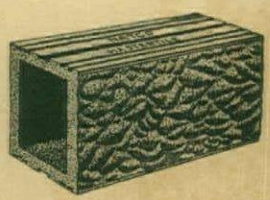
NATCO DRAIN TILE FOR DRAINING LOW LANDS



NATCO BAKUP TILE USED WITH VENEER OF FACE BRICK



NATCO GLAZED BUILDING BLOCK ROCKFACED, FOR FOUNDATIONS AND BUILDINGS

THE BUILDERS' JOURNAL

A stimulating influence in the construction industry for
Good Design Enduring Construction Craftsmanship Business Capacity

VOLUME TWO NUMBER FIVE

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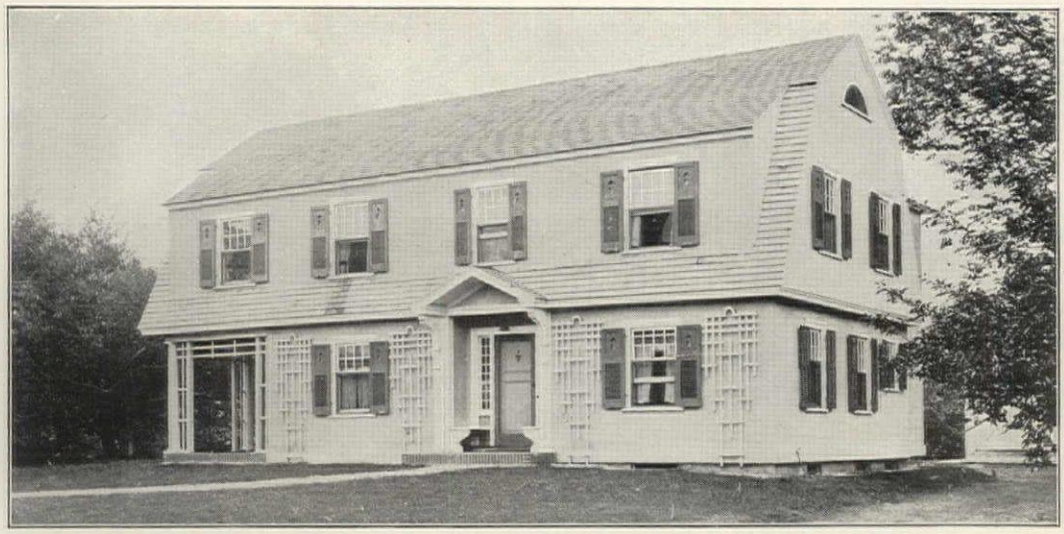

Architect and Owner—Russell F. Barker, 1120 Farmington Ave., West Hartford, Conn.
Contractor—The Bent-Bartlett Co., 43 Ann St., Hartford, Conn. Bishopric Medium Weight Creosote Stucco Base used on Exterior

WHEN BUILDING THAT "DREAM HOME" PROFIT BY

"EXPERIENCE"

1—Skill or practical wisdom gained by personal knowledge, feeling or action; as a means of experience.

2—The sum total of conscious events which compose an individual life. Thus Webster defines the word "EXPERIENCE."

Res.—Mrs. Wm. B. Green, 133 Steele Road, W. Hartford Conn.
Architect—Russell F. Barker, 43 Ann St., Hartford, Conn.
Gen'l Cont.—W. A. Wilcox, 327 Trumbull St., Hartford, Conn.
Stucco Contractor—Peter Leone
Bishopric Stucco Base used on Exterior

Mr. Russell F. Barker, Architect, Hartford, Conn., says:

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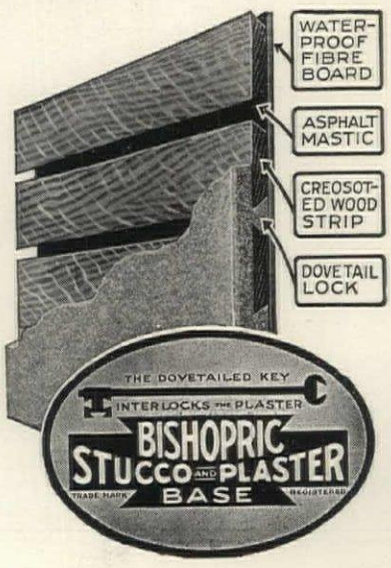

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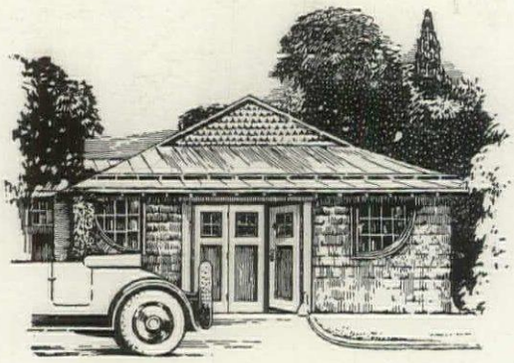

Complete Garage Sets

COMPLETE hardware door sets for garages of all sizes, shapes and designs are among the recent developments of the McKinney Manufacturing Company. Garage doors hung with these sets are easy to operate, offer greater protection and assure an entrance that adds dignity and charm to the whole structure.

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McKinney Garage Sets have been given the same careful attention that is responsible for the worth and work of McKinney Hinges and Butts. The McKinney Manufacturing Co. has been identified with the development of builders' hardware for fifty years.

McKinney hung garage doors are pictured and explained in book form. In this book you will see how easily these sets are installed and how their use makes better looking, stronger and more protective doors possible. This illustrated book is particularly valuable to Architects and Builders. It points a way toward simplified construction and lower building costs. This book, with other literature including the McKinney general catalog, will be forwarded to any Architect or Builder upon request.

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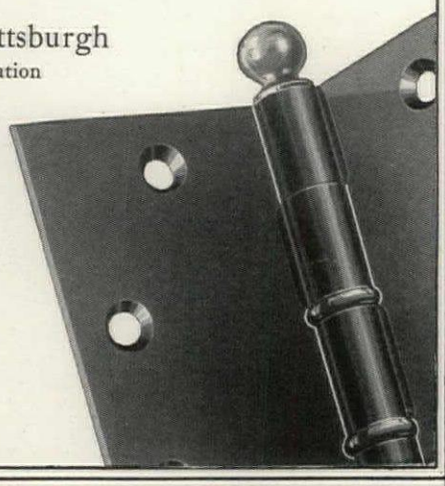


THE BUILDERS' JOURNAL

The Magazine of Better Building

VOL. II, NO. 5 MAY, 1921

Get Busy In Your Own Home Town!

NEW YORK does not always set the pace, particularly in developments in the field of residential building construction. Credit must be given to the officials of that city, however, for recently putting through an ordinance which is probably the most practical effort in stimulating home building yet brought into action.

Briefly, New York has recently passed an ordinance which exempts from a proportion of taxation any new residential construction, of single or multi-family type, which is or has been started between April, 1920 and April, 1922. Based on the New York tax rate this exemption, which is for a period of ten years, offers a saving of over $1,400 on any dwelling or apartment of five rooms or over. The details of this exemption ordinance are given in the Business Finance and Real Estate Department of this issue of THE BUILDERS' JOURNAL. What we are interested in discussing on this page is the underlying principle, and the possibility of carrying out similar tax-exemptions throughout the country.

Let us consider, for example, the prospective building of a house to cost $7,000 on land worth $1,500. When this house is finished it will probably be appraised, for taxation purposes, at about $5,000. The New York ordinance exempts $5,000 of the appraised valuation. Thus on a dwelling of this type there would be no taxes to pay for ten years. Naturally many persons on the verge of building will be greatly encouraged to proceed immediately.

Certainly the cost of building has come down somewhat. Experts say that one can build a house today for 20 per cent less than a year ago. In some localities the present cost is even lower. Add to this an actual saving of approximately 10 per cent on a moderate cost house through tax-exemption, and we get near enough to what we term normal cost so that many builders can get busy.

Here apparently is something definite to shoot at. Instead of running around in circles and bewailing conditions in the building industry, let every Builders' Exchange and organization, and each builder personally, get busy to push through such a measure locally.

We are interested in receiving letters from builders, architects or real estate men telling of any move of this kind which has already been made in other districts. If we can help in any way with practical advice we should be glad to do so.

There will be nothing like this done in your community unless *you* get busy, now, in your own home town.

Current Notes and Comments

Contractors and Labor Reach Understanding in Cincinnati

A WORKING agreement that shows what can be done when both employer and employe get together on common sense grounds, has just been worked out in Cincinnati. A permanent organization of the contractors and labor unions has authorized the formation of a wage board to adjust all mechanics' wages. The main principles agreed upon are that no single trade shall be favored above others; if an advance is given one, the same advance will be given all; and if a decrease is considered necessary, the same percentage of decrease will apply to all. No strikes because of jurisdictional claims will be tolerated, and sympathetic strikes are also barred and, should they occur, the employer is free to hire other workmen.

Perhaps of still more importance in view of today's conditions is the agreement to place no limitations on the amount of work a man shall perform in a day, that apprentices will not be prohibited, that foremen shall be selected by and be the agents of the employers, that workmen are at liberty to work for any employer, and that employers are at liberty to employ and discharge whomsoever they see fit. Such an agreement constitutes a basis for stability in the building business and gives every union and individual member a fair opportunity when they in turn play fair.

Cleveland Working for Better Organization in Building

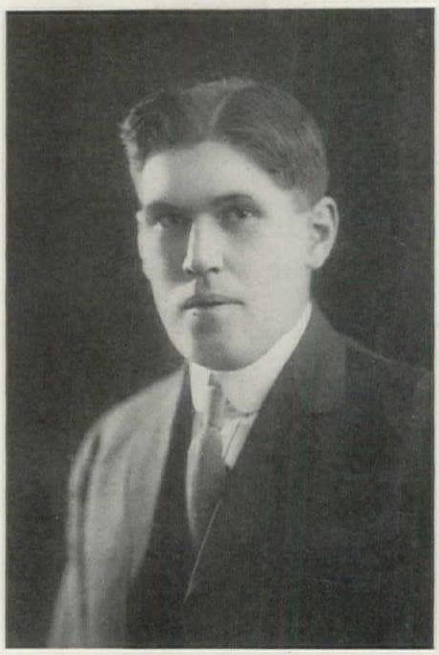
THE wage board of the Building Trades Employers' Association has for several weeks past been delving deeply into the question of regulations affecting the building industry, following the expiration of agreements on May 1.

In accord with the tendency which must be followed everywhere, if general building is to be revived, the chief thought is to standardize working agreements between the unions and employers. So many rules and regulations have crept into agreements during the past few years that there is little uniformity of working conditions, and this imposes a burden of cost on the building public. It is planned, therefore, to arrange starting time, quitting time, hours of labor and other matters of a general nature to apply to all trades alike. Elimination of all restrictive provisions regarding output is considered absolute. Lower wage rates will undoubtedly be offered, the reduction being based on the lower living costs that have come about in the past few months.

An indication of the need builders feel for better business methods is shown by the new department of the Builders' Exchange known as the Better Business Department. This will promote improvements in contractors' business methods, and all members of the Exchange are invited to submit questions on topics connected with cost keeping and estimating.

Betterment of Agricultural Equipment

MR. E. A. WHITE has recently been elected President of the American Society of Agricultural Engineers, a society that is doing a very good work in the promotion of better methods of farming in this country. A large part of the activities of the Society is devoted to the question of modern farm



E. A. WHITE

buildings, and in this respect its work is of vital interest to builders and architects who are connected with the designing of farm buildings. The general tendency of the day is toward standardization of processes and the use of mechanical equipment. This applies to agriculture as fully as to other industries, and the agricultural engineers are performing a valuable service to both farmers and builders. Mr. White is a farm operating equipment man and a broad gauge executive, and under his direction great progress in all lines of the Society's work is expected. The headquarters of the Society is located at St. Joseph, Mich.

Missouri Cities Show Wage Cut and Good Building Prospects

INTEREST in construction work in Missouri during the past month has been centered about labor troubles in several of the large cities and on the reports from the various cities that more building will be done this summer than at any time since 1914.

Labor troubles in St. Louis have been a disturbing factor to a certain extent, but a truce has been called and there does not seem to be any immediate prospect of serious lockouts or other troubles. A few strikes are on in some of the crafts, but in a great measure either the men and the employers have reached an agreement as to the wage scale, or the matter has been held in abeyance for the present.

In the smaller cities and towns of the state there has been a general reduction in wages, in the greater number of cases voluntary on the part of the unions. Bricklayers, plasterers and carpenters in the main have consented to have their daily wages sliced 20%, so that men who have been receiving $1.25 an hour will receive $1 an hour in the future.

Kansas City is experiencing a healthy revival of construction work. Reports of the building commissioners in Kansas City, Kan., and Kansas City, Mo., the sister cities, show that the permits in March exceed in number those of previous months by a large margin. A number of large office and manufacturing buildings are being erected, besides one or two hospitals and church buildings. The same is true in Springfield, where it is said the building program for the coming summer will call for an outlay of at least $2,000,000. More than 200 residences and bungalows are said to be in course of erection now or being planned. *(Paul J. Pirmann, Fulton, Mo.)*

Detroit Sees Beginning of Large Home Building Program

A REDUCTION of 30% of the maximum cost of 1920 obtains in general building operations in Detroit today. A prominent Detroit architect reports that a reduction of 10% in building cost was experienced during the month of February alone. Cheaper material, more especially lumber and brick, has played a considerable part, but the chief factor in lowering costs is the increased production of labor. Wage scales have been pared somewhat, but labor production has increased more than double generally.

Ground was broken early in April for the new Capitol Theater building, centrally located in Grand Circus Park, and estimated to cost $2,750,000. The structure will not only be one of the largest playhouses in America, but will include two 6-story store and office buildings. The home building movement has begun in earnest. Permits issued for factories during March totaled only three, at an estimated cost of $66,700. Frame dwellings ran to 894 at an estimated cost of $1,111,810, and brick and veneer dwellings numbered 126 to cost $915,625. There were 1,683 permits issued, including 555 additions or alterations, entailing an estimated expenditure of $6,297,397.

The Lumber Dealers' Association and one large realty firm are working on separate schemes to encourage home builders to co-operate with them in the erection of dwellings to cost from $3,500 to $4,500. The Employers' Association chart indicates that at the first of April there were 133,000 men employed in Detroit as against the low tide of 38,000 last December. The increase April 1 was 52,000 over March 1. These figures, however, do not indicate any great boom revival, because there are still approximately 100,000 idle men in Detroit. *(G. L. Stryker, Detroit, Mich.)*

(Continued on page 50)

Vocational Education

The shortage of skilled mechanics must be overcome

By John H. Vincent

Secretary, Commerce Club, St. Joseph, Mo.

WHEN the Senate Committee on Reconstruction and Production held one of its investigating sessions in Kansas City recently, one of the most important factors in high building costs was passed over with but slight mention. Prices of lumber, brick, cement and other building materials were given much consideration, as were also the money situation, housing conditions, and combinations, but reference to the need for an increase in the supply of skilled building mechanics was but barely made.

Conditions in Missouri are not different in this respect from those in other localities. Apprentices are few and far between. There is no great interest displayed in the apprenticeship system nor, for that matter, in any method of trade training for the youth. And this in spite of the fact that employers constantly lament the shortage of skilled men. The age-old apprenticeship system is virtually obsolete. Changing industrial conditions are partly responsible, of course, but was there not also something inherently wrong in the system itself?

The fact that the system is gone is not so much to be regretted as is the fact that it has not been supplanted with something to take its place effectively. Not so many years ago, the youth of the land clamored to learn trades. In fact so great was the demand that many unions not only limited the number of apprentices that each employer might have, but in many cases allowed none but the sons of members to be apprenticed. This condition created a monopoly, the evil effects of which are now apparent. The number of new mechanics has not kept pace with the removal of the old.

The present shortage is, to a large extent, the result of such an unsound policy. Other factors, of course, enter into it. The attractions of the automobile, electrical and other spectacular trades have kept many out of the more monotonous building trades. The length of time which the apprenticeship demanded is also an element at which many boys balked, nor has the attitude of the employer been favorable to the maintenance of the system. In the old days the employer took a pride and a paternal interest in his boys; his main idea was not to make a profit from a boy's work but to turn out a finished mechanic. In fact his interest was such that at the close of the apprenticeship term, it was his custom frequently to present the boy with a suit of clothes, a Bible and a blessing.

Now, however, there is no such interest. An apprentice is now appraised not on the basis of how much he can *learn* but on how much he can *earn*—for the employer. With lack of interest on the part of the employer comes lack of responsibility on the part of the boy. Hence, after 6 months or a year of work, with probably little encouragement from the employer, he is ready for the lure of a job as a driver of a Ford, with the consequent result that the employer again pledges himself never to bother with another apprentice.

The Solution

What is to be the solution? The building trades must not die out. Their work cannot be done by machinery, to any extent. True, the paint spray in the painting trade, portable saws and other machinery in carpentry, and some mechanical devices in other trades are helping to offset the lack of skilled workmen, but from the very nature of most of the trades a combining of mind and muscle must always be a dominating requirement.

This brings us to the subject of Vocational Education; not the manual training which every modern school embraces in its curriculum, not toy-making practice, but full, practical training. In no sense do we belittle manual training for the young; it is good and has its place, but if in the mind of the young man there is to be instilled a desire to learn a trade, it must come through association with the real thing—not an imitation or a model.

The aid which the government and the several states give to vocational work makes it possible for almost any community to establish and maintain trade schools.

The trade school idea goes even further than this. It offers the great advantage of lessening the time necessary to learn the trade. Under the apprenticeship system no trade could be learned in less than 3 years or more, or rather *thoroughly* learned, because the student picked up his knowledge mostly by observation or at best was taught by those who, though they may have been well qualified as mechanics, were not equipped with the necessary ability to convey or impart information to others.

The intensive training of the trade school, the *how* being successively followed by the *why* under the direction of professional instructors, can accomplish as much in a year's time as in 2 years of the old method. Not that a one-year trade school student will often be a finished mechanic, but that he will be so far advanced that he becomes an attractive investment to an employer and a second year of actual work in which the trade spirit and its various tricks can be acquired will, in the vast majority of cases, turn out a more finished, intelligent and competent workman than the old apprenticeship system could ever be expected to do.

The union leaders are no longer opposing trade schools; they are in fact proposing them. They see that the success and growth of unionism depends on the growth and intelligence of their membership, and that since the apprenticeship system no longer supplies that growth some other method must be adopted which will.

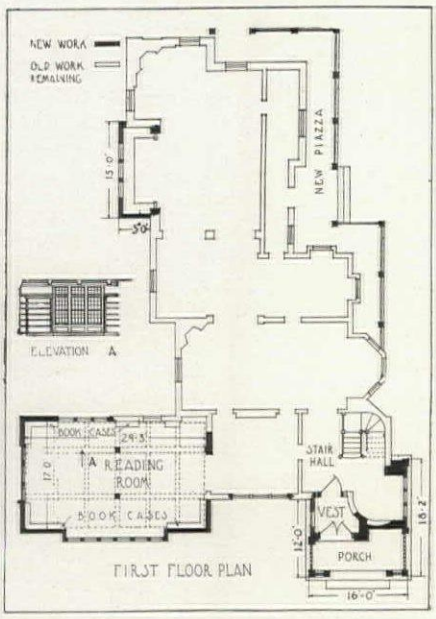
A recent survey of the painters in this city reveals the startling fact that 90% of the men engaged in that trade are over 45 years of age, and that only 3 out of the 20 shops investigated have an apprentice. This situation is perhaps a little bit more extreme than exists generally, but unless something is done at once to provide more skilled men it will not be an unusual situation. The time is at hand when more mechanics must be provided, and it is plainly to be seen that this can be done only by the trades associations themselves.

Magic in Alterations

No building needs to remain ugly and a money loss with metal lath and stucco at hand

The Donald G. Mitchell Memorial Library, Westfield, Conn.

Brown & Von Beren, Architects



THE magic that can be performed with metal lath and stucco is clearly shown in these two pictures. At the top we have a hideous example of the worst in the jig saw period. At the bottom may be seen the same building with no very great structural changes except a new roof in part, the addition of an entrance porch and the enclosing of an old porch to make a room. The pleasing result shown in the lower illustration has been gained chiefly by removing the old ornament, covering the whole structure with a coat of stucco on metal lath, and enlivening the building by a few touches of half timber work.

Stucco Construction

Successful results depend upon using the material in the right way. Detailed directions are given here

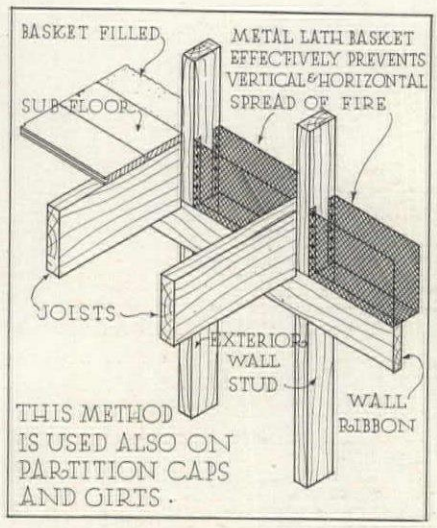
IT is but natural that with the development of new materials incorrect ways of using them should come into practice. Different building materials have different qualifications, and perform the best service only when the conditions under which they are used are most suitable. It is, therefore, of importance to builders to know the correct ways of using materials so that dissatisfaction on the part of owners may be eliminated.

In connection with the country-wide competition for the design of small houses that was conducted by the Own Your Home Expositions in New York and Chicago, there was a surprising revelation of a lack of definite knowledge of the small details which make for successful stucco work.

The subject of stucco has been given very careful consideration by the American Concrete Institute, and we present here a summary of the recommendations which have been made; if these directions are carefully followed there should be little complaint as to the permanence and weather resisting qualities of stucco, whether on frame or masonry construction.

"Successful stucco work depends in large measure upon suitable design of the structure for stucco. Exterior plaster of any kind merits whatever protection can legitimately be given it, and while concession must sometimes be made to architectural requirements, there is rarely any necessity for subjecting stucco to an exposure which it cannot reasonably be expected to withstand.

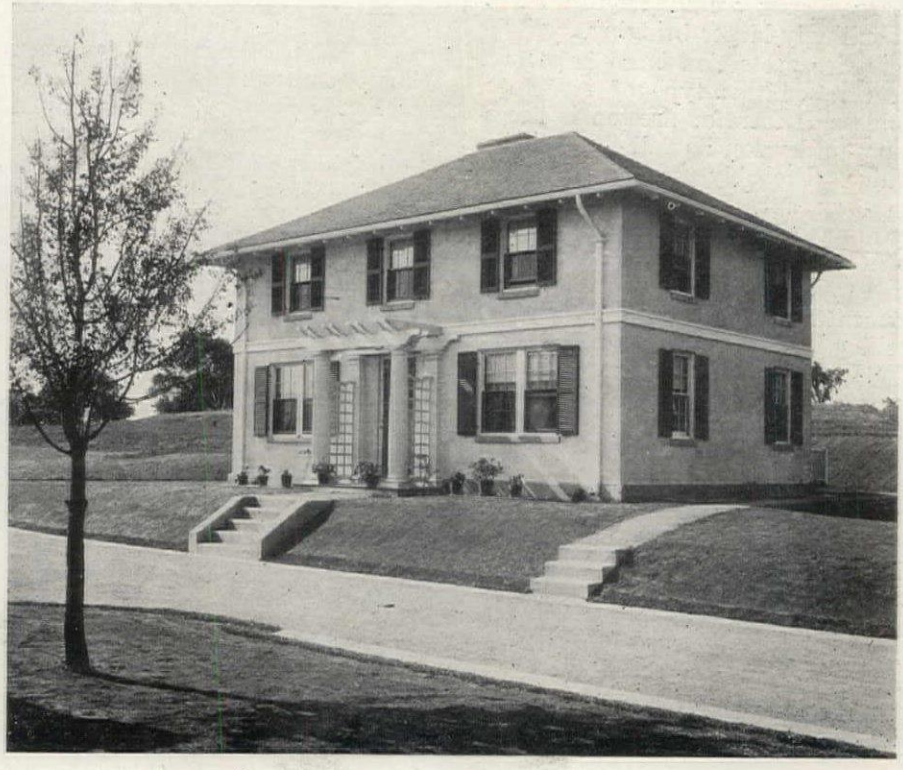
"Whenever the design of the structure permits, an overhanging roof or similar projection is recommended to afford protection to the stucco. Stuccoed copings, cornices and other exposed horizontal surfaces should be avoided whenever possible. All exposed stuccoed surfaces should shed water quickly, and whenever departure from the vertical is necessary, as at water tables, belt courses and the like, the greatest possible slope should be detailed. Stucco should not be run to the ground whenever other treatment is possible. Should the design of the structure require this treatment, the



backing should be of tile, brick, stone or concrete, providing good mechanical bond for the stucco, and should be thoroughly cleaned before plastering. Unless special care is taken to thoroughly clean the base and each plaster coat from dirt and splash before the succeeding coat is applied, failure of the stucco may be expected.

"Suitable flashing should be provided over all door and window openings wherever projecting wood trim occurs. Wall copings, cornices, rails, chimney caps, etc., should be built of concrete, stone, terra cotta, or metal with ample overhanging drip groove or lip, and water-tight joints. If copings are set in blocks with mortar joints, continuous flashing should extend across the wall below the coping and project beyond and form an inconspicuous lip over the upper edge of the stucco. Continuous flashing with similar projecting lip should be provided under brick sills. This flashing should be so installed as to insure absolute protection against interior leakage. Cornices set with mortar joint should be provided with flashing over the top. Sills should project well from the face of the stucco and be provided with *drip grooves* or flashing as described above for brick sills. Sills should also be provided with stools or jamb seats to *insure wash of water* over the face and *not over the ends.* Special attention should be given to the design of gutters and down spouts at returns of

A stucco house showing proper details. Note overhang of roof and concrete base course with wash



porch roofs where overflow will result in discoloration and cracking. A 2-in. strip should be provided at the intersection of walls and sloping roofs and flashing extended up and over it, the stucco being brought down to the top of the strip.

"All roof gutters should be fixed, and downspout hangers and all other fixed supports should be put in place before the plastering is done, in order to avoid breaks in the stucco. All trim should be placed in such manner that it will show its proper projection in relation to the finished stucco surface.

FRAMING—

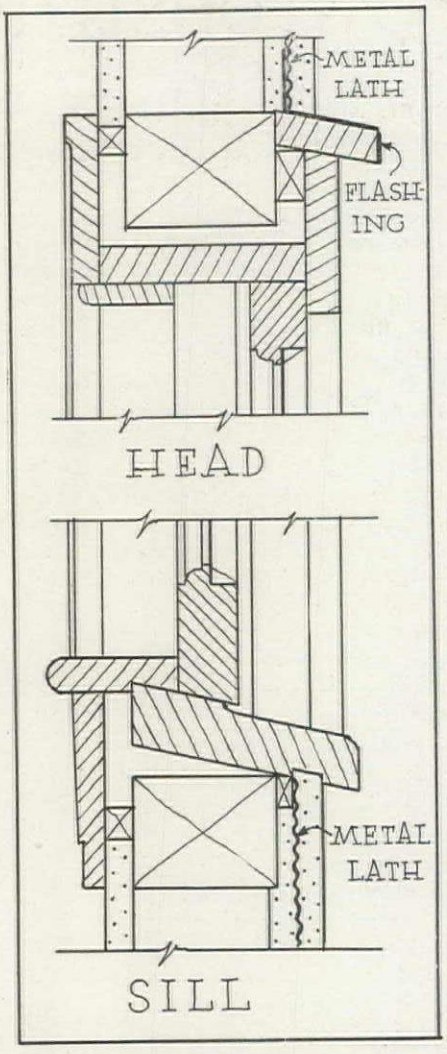
"Studs spaced not to exceed 16 ins. o. c. should be run from foundation to rafters without any intervening horizontal members. The studs should be tied together just below the floor joists with 1 x 6 boards which should be let into the studs on their inner side, so as to be flush and securely nailed to them. These boards will also act as sills for the floor joists, which in addition should be securely spiked to the side of the studs. The corners of each wall should be braced diagonally with 1 x 6 boards let into the studs on their inner side, and securely nailed to them.

"In back-plastered construction in which sheathing is omitted, at least once midway in each story height, the studs should be braced horizontally with 2 x 3 bridging set 1 in. back of the face of the studs. This assumes that the studs are 2 x 4. Larger sizes would require correspondingly larger bridging.

"Fire protection is an important feature of this type of structure, and some form of firestop is necessary to develop its full fire-resistive value. Probably the best method is to form a basket of metal lath to occupy the spaces between the studs at the juncture of the floor joists and wall. This should be filled with cement mortar or concrete from the ceiling level to 4 ins. above the floor.

"In back-plastered construction no waterproofing is necessary. In sheathed construction, over the sheathing boards should be laid in horizontal layers, beginning at the bottom, a substantial paper, well impregnated with tar or asphalt. The bottom strip should lap over the baseboard at the bottom of the wall, and each strip should lap the one below at least 2 ins. The paper should lap the flashings.

"When furring forms an integral part of the metal lath to be used, then separate furring as described below is omitted. In sheathed construction painted 3/8-in. crimped furring not lighter than 22 gauge, or other shape giving equal results, should be fastened over the sheathing paper and directly along the line of the studs, using 1 1/4-in. x 14-gauge staples spaced 12 ins. apart.



Note flashing at head carried back of metal lath. At sill a piece of sheet metal tacked at each end will prevent water flowing off ends

"In back-plastered construction galvanized or painted 3/8-in. crimped furring, not lighter than 22 gauge or other shape giving equal results, should be fastened direct to the studding, using 1 1/4-in. x 14-gauge staples spaced 12 ins. apart or 4d nails. The same depth of furring should be adhered to around curved surfaces, and furring should be placed not less than 1 1/2 ins. nor more than 4 ins. on each side of and above and below all openings.

"Metal lath should be galvanized or painted expanded lath weighing not less than 3.4 lbs. per square yard. The metal lath is placed with the long dimension (8 ft.) across the supports and fastened by nailing or stapling every 6 ins. Nails should not be less than 6d and driven to a penetration of at least 7/8 in. and bent up to engage at least one strand of the lath without breaking, or if staples are used they should be 1 1/4 ins. by 14-gauge smooth wire and driven to a penetration of at least 7/8 in. The nails are always bent over the furring, while the staples are driven astride the furring. The metal lath sheets are lapped not less than 1/2 in. on the sides and are tied once with 18-gauge black annealed lathers' wire between supports. The ends are lapped not less than 1 in. and the lap must be over support. The lathing is started at the top and carried down, the lower sheet lapping over the one above for ease in plastering.

"The air space in back-plastered walls may be divided by applying building paper, quilting, felt, or other suitable insulating material between the studs, and fastening it to the studs and bridging by nailing wood strips over folded edges of the material. This insulation should be so fastened as to leave about 1 in. air space between it and the stucco.

"The study of the experimental panels at the Bureau of Standards has yielded considerable information, which is of lasting value.

"One of the most important indications from these panels is that *lean mixtures* containing well graded aggregate give better results than those commonly specified. Mixtures as lean as 1 part of cement to 6 or 7 parts of graded aggregate have given excellent results in these tests. The committee is of the opinion that the volume change of rich mortars is accountable for much of the unsightly cracking of stuccos, and that no mixture should be used in which the proportion of cement is greater than 1 part to 3 parts of fine aggregate.

"The effect of hydrated lime in cement stucco has also been given considerable attention, and the conclusion which is forcing itself upon the committee is that hydrated lime does not improve the structure of the stucco, but by imparting better working quality to the mortar, reduces the cost of application. On the other hand, there is evidence that not more than 20% of hydrated lime, by volume of the cement, should be added to cement stucco if the best results are to be obtained."

Two Colorado Houses

Bungalow type, with low roofs, particularly suited to stucco

William W. Stickney, Architect

By Theo Merrill Fisher

IF a survey of the city were made to select the most satisfactory homes in Pueblo, it is quite probable that an unprejudiced verdict would assign high rank to the houses designed by William W. Stickney, architect, for W. T. Mathis and B. A. Carlile. In the way of general attractiveness and convenient, economical arrangement these dwellings compare favorably with the successful small houses in any section of the country.

The Mathis house possesses individuality of design and excellent proportions. The roof lines are well disposed, the wide overhang of the eaves affords a desirable emphasis, and the bay window and the covered front porch are not only effective details in themselves but serve to tie the entire structure together. The hood over the doorway is another item the importance of which should not be overlooked. The construction is of stippled stucco on expanded metal lath which is nailed to the studding, and the whole back plastered. The Portland cement has been left its natural color. The outside trim is painted ivory white and the shingled roof has been stained a moss green. The floors of the open and enclosed front porches are of hard finished cement marked off in tile pattern, the balustrade and two flights of steps being of the same material.

Across the front of the house are the living room, which one enters directly from the porch, a library on one side and a dining room on the other; all are of generous dimensions. The floors are oak and the trim in all three rooms is of Oregon fir stained dark brown, which brings out the grain in black. The division between living room and dining room is a columned opening finished with bookcases on the living room side and on the other with a wainscot about 4 ft. high, of 6-in. matched boards with V joint, continued around the room. Into this arrangement the built-in buffet, with its ample drawer and cupboard spaces and leaded glass cabinets on either side of small windows, neatly fits. This unusually successful detail is illustrated and plans for its construction are given elsewhere in this issue of THE BUILDERS' JOURNAL.

The living room fireplace is of brown brick with plenty of texture, and the breast of the same material is carried to the ceiling. The hearth is of tile. The doors giving access to the library have large panels of clear glass. In addition to the usual center ceiling electric outlets there are four sidelights each in living room and dining room. The two bedrooms are commodious; each has a large closet with mirror panels in the doors, yellow pine floors and sand finished plaster walls. A sleeping porch which will readily accommodate two beds adjoins the master's bedroom.

The kitchen features include a built-in combination of drawers, cupboards and sink which occupies one side of the room. There is ample lighting from the windows over the sink on the east side and from the breakfast room adjoining. This latter apartment—as it should be—is a tiny room, with imitation tile wainscot, cove ceiling and colonial cupboards. The house has a poured

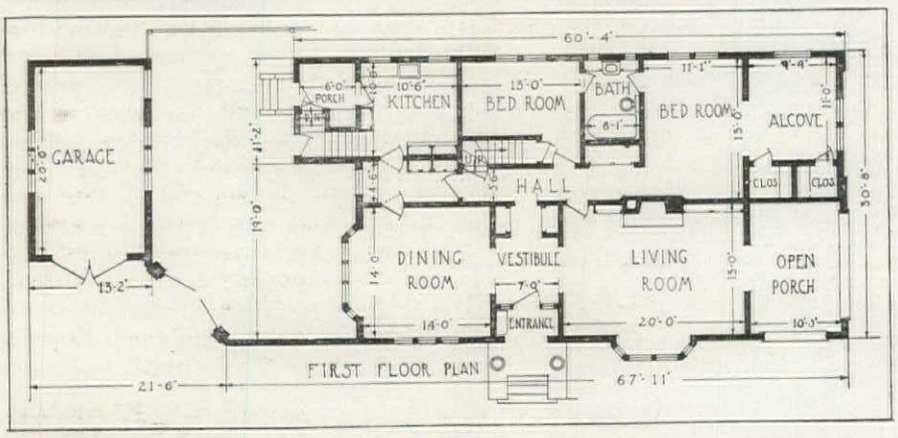
The Mathis house — a generously planned bungalow with plenty of window openings. Note the double garage on the right

A wood paneled chimney breast and bookcases either side form the main features of the living room

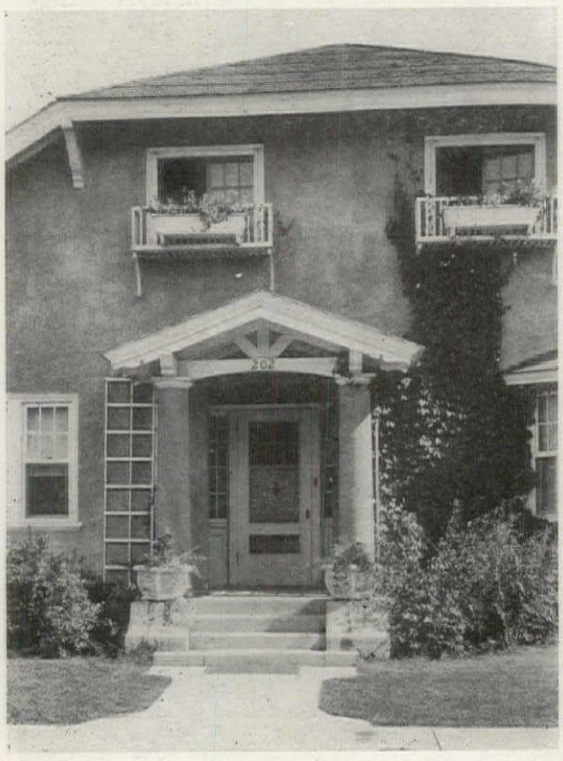
concrete foundation, the basement being fully excavated, and the heating is from vapor system equipment.

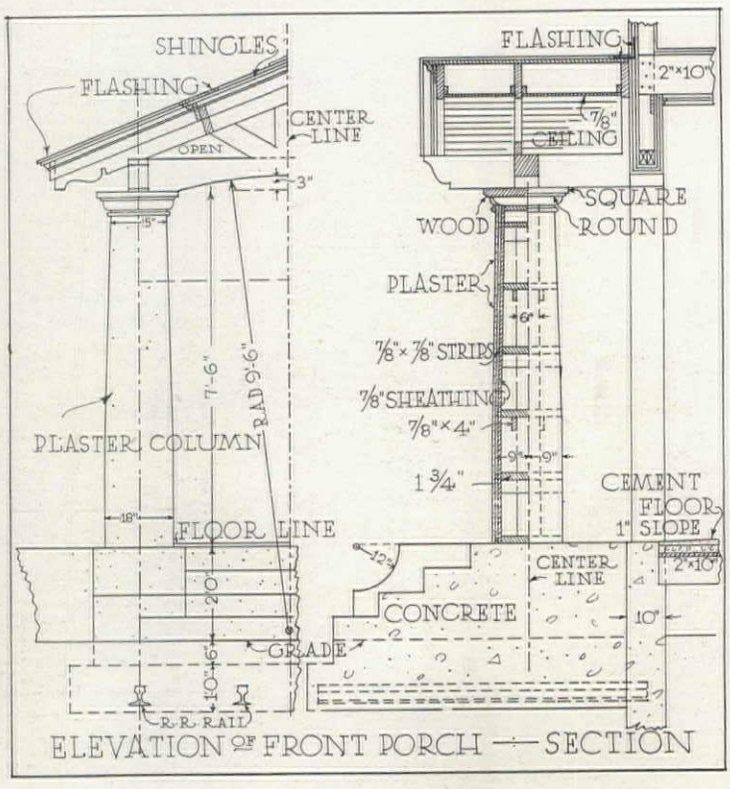
Although quite different in style, the Carlile house has the same simple dignity and homelike atmosphere as the Mathis residence. The design combines successfully a few simple elements, as will be seen from the illustrations. The long roof lines—the shingles laid in well marked courses—the design and grouping of windows, the cut-off corners of roof peaks and dormers, plus a touch of decorative ironwork in the small balconies at two of the upstairs windows, are all important factors in the charm of the exterior.

The construction is practically the same as that of the house just described except that the stucco is float surface; the reddish yellow tone was secured by mixing the coloring matter with the cement material. In both dwellings unusual winter warmth has been insured by building the papering, which was laid on the sheathing, into the frames of the doorway and window openings. Shrubs and plants about the entrance and against the house,



Details of entrance porch to the Carlile house. Note construction of stucco columns around center post and reinforcement to footings. Floor plan at left





Dining room buffet in the Carlile house is built into a bay window, with small casements over the drawers and cupboards

climbing vines and window boxes, a well kept lawn and a few trees, accentuate the pleasing appearance of the house.

There is a recessed space before the entrance door, with cemented floor and a seat. The small hall or vestibule within opens through wide framed archways to living room and dining room. The built-in cabinet work and trim in silver gray stained Oregon fir are the chief items of interest. The living room mantel has a facing and hearth of plain red brick set in white mortar. The overmantel is of paneled wood carried up to a 10½-in. cornice moulding which serves as a capping for it. The bookcases which flank the fireplace come to the 5-ft. level of the mantel shelf. The base of these bookcases corresponds to the 11-in. baseboard around the room. There are the usual center ceiling electric outlet for indirect lighting globe, and four sidelights, two of which are on the overmantel. There is a bay window with seat on the south side. Through double French windows at the east end one enters an attractive sun porch with cemented floor and large window spaces on its eastern and southern exposures. This serves as a pleasant, informal sitting room all the year around.

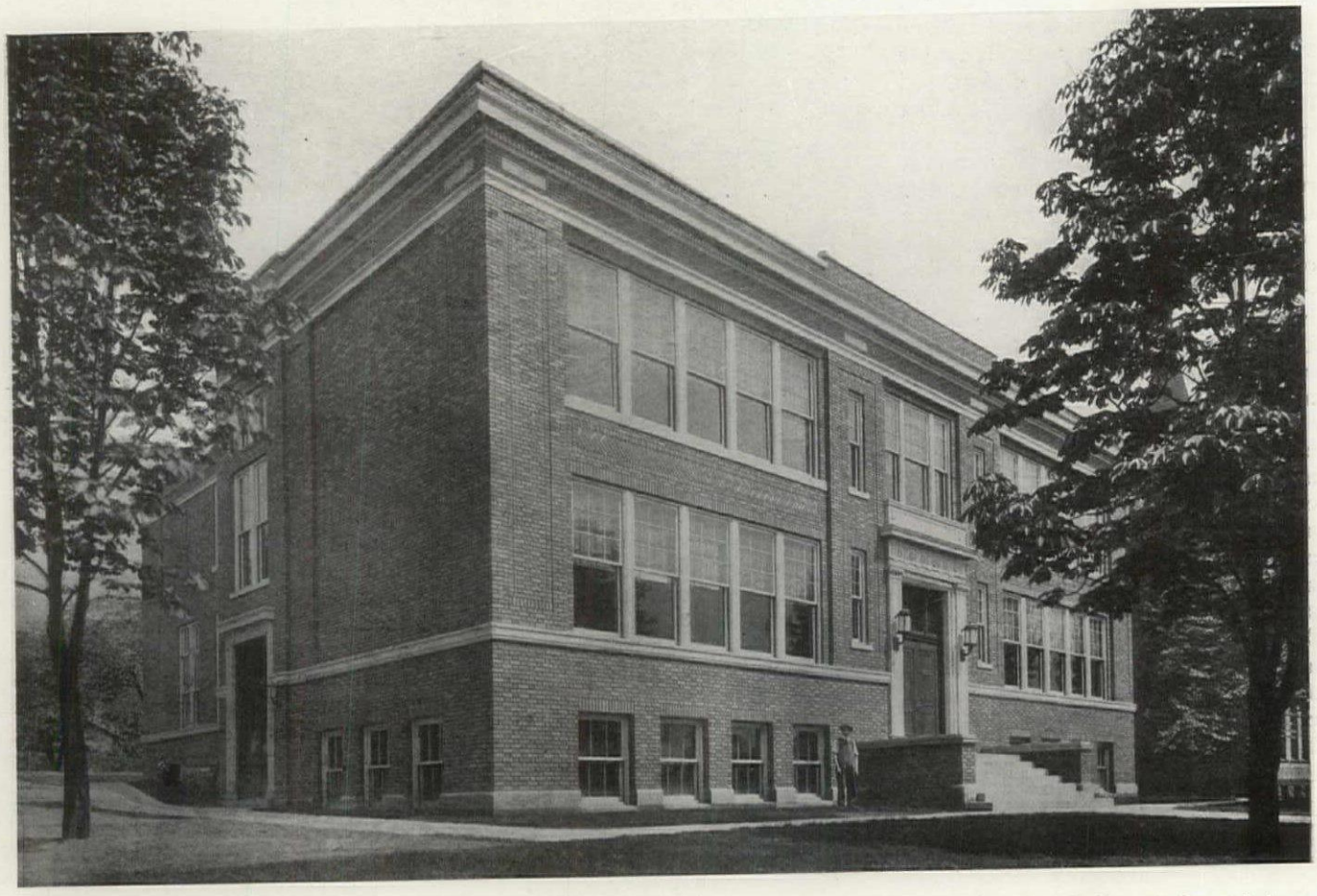
The dining room buffet occupies a bay window recess. This is somewhat over 10 ft. in length, the arrangement in detail being made clear by the illustration; the muntins of the bottom cabinets, it might be remarked, are of copper. The walls are finished with the same wide top moulding and baseboard as the living room and have been given a paneled effect by a dado carried to a 5-ft. height, the same as the bottom of the buffet windows. Wood strips 4 ins. wide alternate with spaces 16 ins. wide filled with wall paper. Connection with the kitchen is had across a narrow hall which is a continuation of the main hallway that parallels the dining and living rooms, although separated from it by a glass-paneled door.

Note attractive sun porch in the Carlile house below, and interesting roof surface secured by doubling every sixth shingle course

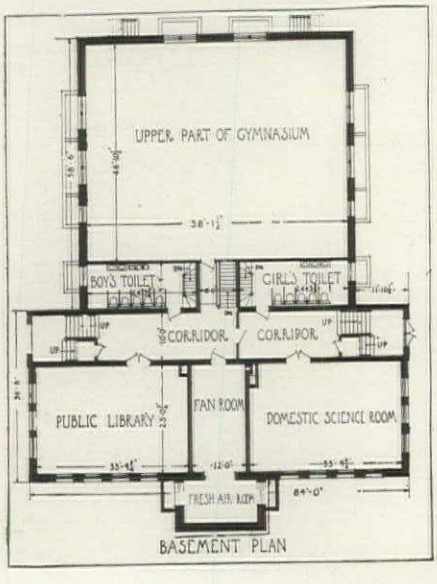
A Modern Small High School

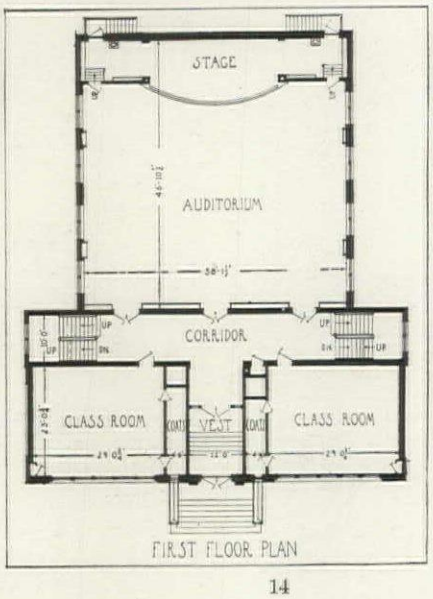
Good design in face brick and simple, compact plan are features of this school at Ben Avon, Pa.

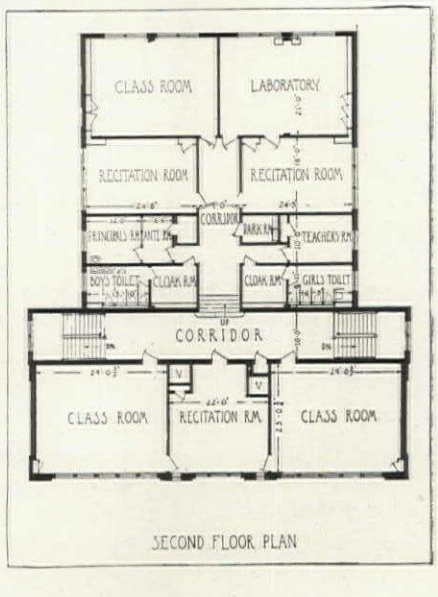
Robert Maurice Trimble, Architect



THIS design shows a dignified type of high school building that meets the needs of many communities. It has four class rooms in the front portion, and three recitation rooms and two large rooms at the rear of the second floor for laboratories. A large auditorium is included on the first floor, with ample exits into the main corridor, and directly beneath the auditorium is the gymnasium, a story and a half high, the floor being at the sub-basement level. The exterior walls and main partitions are of brick, 13 ins. thick, and the secondary interior partitions are of hollow tile. Vent enclosures are of stud construction







Interpretation of Plans

Part IV. Application of principles, explained in previous articles, to typical plans

By Victor D. Abel

Boyd, Abel & Gugert, Architects

THE three preceding articles of this series have been divided into definite subjects having to do with the reading of plans, the first giving definitions, the second, indications, and the third, describing scale and dimensions. Each has its own distinct bearing upon the subject, and each should be thoroughly understood in order to be able to properly interpret blue prints of building construction. Together, the three divisions, if such they might be termed, make up the complete method of getting the necessary information from drawings. Each portion may vary greatly on every drawing, but if well grounded in the different branches the mechanic can feel secure in the knowledge that he should be able to read the great majority of plans without difficulty, except as to the work contained in what is known as "mechanical equipment," or other specialized features which will be separately treated in the next article. The reading of this portion of a plan is usually confined to the mechanic whose work is in that particular trade, but a wide knowledge of these features should be encouraged among all trades.

In this fourth article we will apply the lessons gained from the studies previously made. There will be no attempt to show from which of the preceding articles has come the particular knowledge which we are using, as applicable to the plan which we may be studying, but we shall assume that the student has become proficient enough to intelligently follow our explanations and carry them. It is, however, desirable to keep in mind that in our text, as applied to the description of each drawing here presented, it will be especially found that the definitions are being constantly used in describing the various parts of the buildings and their locations.

The plans illustrated here are all taken from the work of the firm of which the writer is a member, Boyd, Abel & Gugert of Philadelphia. In thus using drawings from actual practice, it has been possible to select a variety of work which covers many of the types of buildings upon which the average mechanic will work during the course of following his trade from year to year.

The information from each drawing, as here generally described, is not divided into the various trades, into their relative importance, nor in the order in which the information is needed in the construction of the buildings. As to the first, the work of the different trades is so interrelated that it cannot be said that a particular item applies exclusively to any one branch, except it be in the mechanical equipment. Take, for instance, the furring of a brick wall, as indicated in Fig. 14. The wall is of brick, a brick mason's job; placing the furring strips in the wall, which must be done as the wall is being erected, is the work of the carpenter; the installing of the furring pieces, which receive the plasterer's lath on the inside of the wall, after it is built, is of carpenter work, if of wood; metal lather's work, if of metal, or brick mason's work, if of terra cotta. The lathing is either of wood or metal, which is the work of the lather, and the coats of plastering belong again to another trade. This distribution of work will be found constantly throughout the construction of any building, no matter how simple it may be. This is one of the most important points which must always be kept in the mind of anyone reading the plans of a building, for all of the work belonging to any and all trades must be thoroughly understood in order to be properly laid out to fit in with the work of others.

As to their relative importance, every part and parcel of a building is equally essential. The small electric switch plate, placed on the wall after nearly everything else is finished, is just as necessary as the stones placed in the foundation walls of the building. They are both required in order to properly finish the building. The only question of "importance" is that it is very important, indeed, to build into the structure everything that is shown upon the drawings and mentioned in the specifications, or implied by them either singly or in conjunction with each other.

The order in which the information is required at the building varies somewhat, it is true, but emphasis must be laid upon the fact that

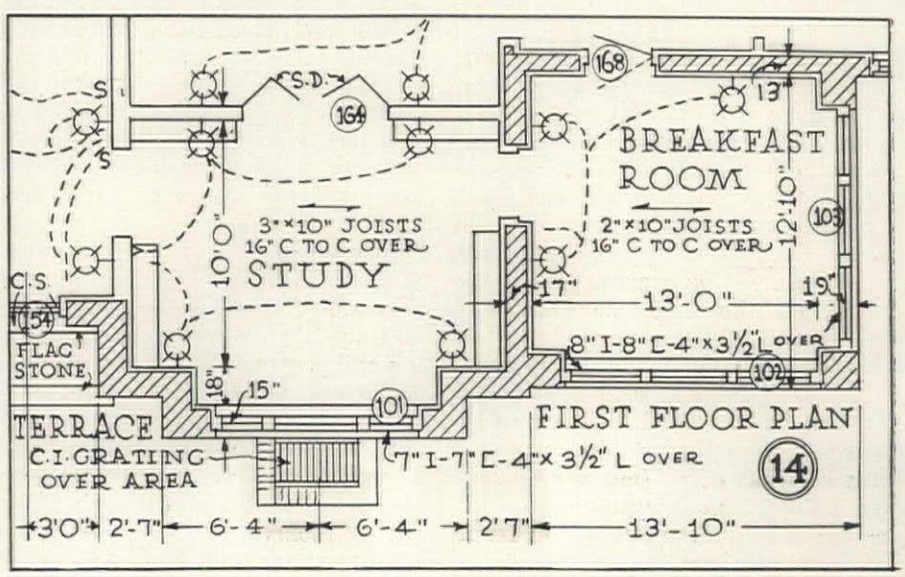


Fig. 14. Part of first floor plan of brick house showing furred walls, steel window lintels and method of noting various details on drawings. Scale ⅛ in. = 1 ft.

it is highly important to know just what is to be the finishing material or its final location, so that the preliminary or rough work may be correct. Taking again the little electric switch as an example, knowledge of its final location, its size, type, what lights it is to control, and from whence the electric current which actuates it is to come, is of greater importance than the actual fact that there is to be some rough wiring. Its successful working, in the complexity of the modern building, is entirely dependent upon the preliminary work of all the trades in any way related to it.

In our reading of various types of plans we will first take a portion of the plan of a fair sized country house of brick as shown in Fig. 14. Going over it, we find the exterior walls to be indicated as of brick 13″ thick, with 2″ of furring and plastering on the inside, making 15″ over all. The wall between study and breakfast room is furred and plastered on both sides, making a total of 17″. The piers forming walls of breakfast room are 17″ of brick, furred on the inside, or 19″ over all. The interior partitions are of frame, and the specifications give the thicknesses of studs and the plaster and wood finish.

It will be noted that steel lintels are called for over large openings, as over opening 101. The note reads 7″ I–7″ [–4″ x 3 1/2″ L over, which means that there is to be furnished and placed a 7″ I beam with a 7″ channel and the angle of size called for, arranged as shown in a detail drawing. The same arrangement of steel, except of larger size, is to be noted over openings 102 and 103. Continuing with ironwork, note that a C. I. grating is shown and called for over the area in front of opening 101.

Joists are noted in study and breakfast room, giving their sizes, spacings and directions. In connection with these notes on the actual construction, it is well to emphasize the fact that joists, beams and girders are always shown so as to occur above the supports upon which they are to bear. For example, the joists noted on the first floor plan, of which Fig. 14 is a part, form the floor construction of the second floor. The steel shown at openings means that it is intended to be placed above the openings. Note at opening 154 that C. S. (cut stone) sills are called for. Flagstone is noted as the floor for the landing in front of these openings.

Among some of the details which

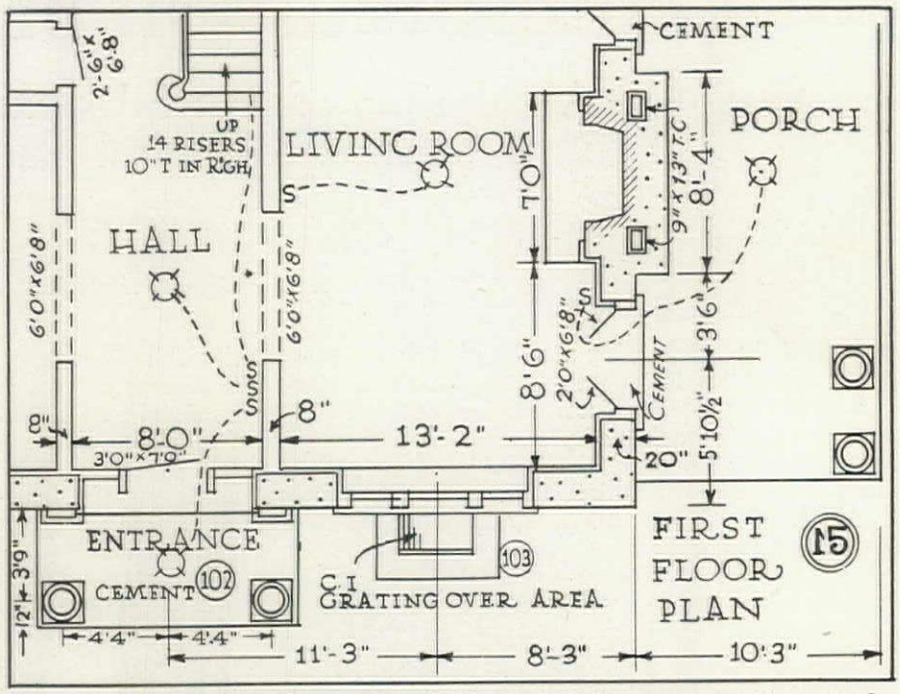


Fig. 15. Part of first floor plan of stone house showing method of figuring openings to center them on inside walls. Scale ⅛ in. = 1 ft.

may be called to the attention as one goes over the plans are S. D. at opening 164, thus calling for sash doors, and at 168 a double swinging door is indicated by the use of the two lines on either side of openings, one solid and one dotted.

This is a comparatively simple plan to read, as is also the portion of the first floor plan of the stone house illustrated in Fig. 15. This plan is particularly complete in the dimensioning of the openings. They may be checked as to locations, and it will be found that they are all carefully worked out to center in the rooms or spaces in which they occur, and if carefully followed as the building is constructed, they will be accurately placed as intended. On this plan the sizes of doors are also marked, although this is often developed after the work of construction has started. In such cases the foreman is later furnished with a separate list of doors, giving widths, heights and paneling.

Round columns of wood are indicated on both the entrance and main porches. Note that the area under opening 103 has iron gratings called for and shown. The stairs have the number of risers noted. The handrail is shown curving out at the bottom, which is so often done in stair work. The sizes of openings between the hall and the living and dining rooms are given and arches are shown without doors. Note the construction of the fireplace, which is stone, the same as the exterior walls of the building, and lined on the back, jambs and face with brick.

Fig. 16 is a portion of the first floor plan showing an addition to a frame house with interior alterations in the existing portion. The elevation of this portion is shown in Fig. 17. Comparing these two, it will be seen how essential they are to each other. On the plan it will be noted that while opening 108 is shown as a window and 154 as a door, their sizes and arrangement cannot be determined until they are examined in the elevation which clearly shows both. The lower part of the door is dotted because it is behind the porch rail. Note by the indication (dotted lines) for old work removed that a considerable portion of wall is taken out and the building extended beyond the old walls. The existing portion to remain is shown with full lines, and the new work in solid black, including where it joins the old, even to the slight amount of patching required where new doors are cut in, as at 155, where an old opening is filled in, and as in the pantry at 156, where this is unmistakably shown. Openings 105 and 106 are shown as double casement windows, opening out. A new chimney of brick, with flue and vent space, is shown to be constructed in the kitchen.

In the elevations in Fig. 17, in addition to showing the sizes of openings, the exterior facing of the wall is shown and noted to be of shingles. It is shown that the walls to the bottom of the first story joists are of stone, with a moulding at the top of the stonework before the clap-

boards start. The chimney above the roof is shown to have stone facing, with a cut stone cap. Existing openings are shown in outline only, but at 101, where it is noted as "old window reset," it is drawn in detail.

A plan or elevation as carefully drawn and as fully noted and dimensioned as these makes the work of reading them simple. It is only necessary to firmly fix in mind all of the notes and instructions and to see that they are carried out. The indications are all clear, there are no loopholes left, and as a result the contractor in preparing an estimate upon the cost of the work finds it convenient to properly take off and include all materials and labor required for its erection, and the foreman finds no difficulty in interpreting the directions during the work of construction.

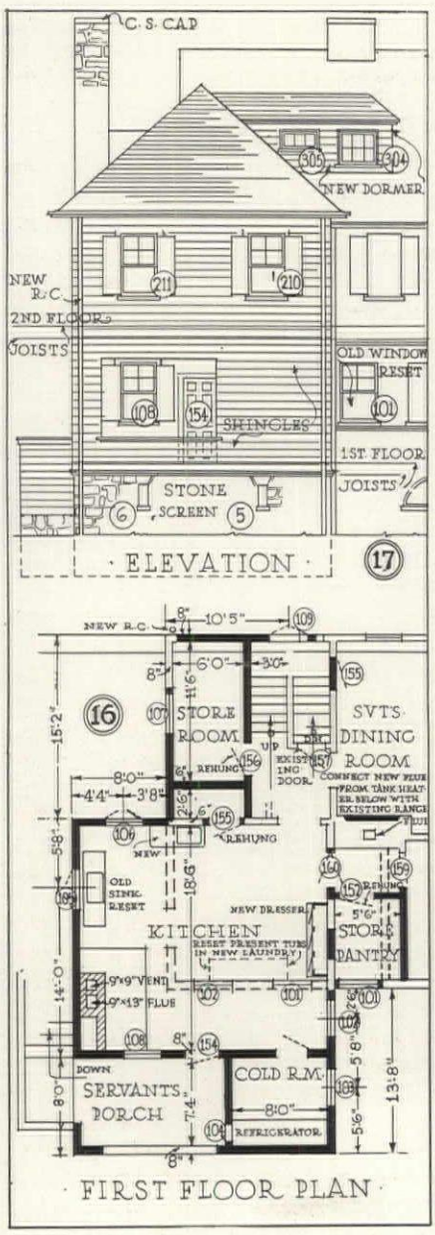
Figs. 18 and 19 are portions of the first floor plan and of the street elevation of a 7-story, reinforced concrete office building. The plan is of a corner having a side entrance to a tower stairway, which is enclosed by brick walls 9″ thick. The passage also gives access to the main part of the building and to an elevator in the corner. This latter has also a large opening directly to the pavement, which opening (137) is indicated on the elevation. The new building is attached directly to an existing structure, and in the right hand portion of the plan, between columns 19 and 21 and at the front corner at column 26, the existing walls are drawn in light lines. A sliding fire door also connects the two buildings at opening 125, as noted. The columns are all indicated for reinforced concrete, and are numbered for convenience in location and description and in detailing the cores or reinforcing upon the column schedule which accompanies such a plan. Note how the concrete columns are shown with "rabbets" so that the brickwork can be securely tied into the column, insuring a tight joint between the two.

This plan is of particular instructive value because of the different forms of construction shown. The base of the building has granite facing to the first floor line, including the steps to door 120. Note how the veneer is shown on the plan. Above the granite the facing calls for cut stone, which is specified in this case to be of limestone. Above the cut stone, brick becomes the facing. The upper part of the building is also finished with brick, but it has cut stone panels and terra cotta cornice as shown in the elevation of the top of the building. See Fig. 20.

In Fig. 18 at door 121 an iron sill is called for, and the door is noted "Glazed F. D.," indicating it is to be a fire door with glass. The street door to elevator, door 137, also has an iron sill, and is noted to have both "iron folding gates" and "steel rolling doors."

The indication of the method of construction of the book vault is worthy of notice. The brick walls have an air space between the inner 4″ of brick and the outer 9″ wall, making the vault additionally secure against damage from fire and keeping it dry for the storage of papers.

Figs. 16 and 17. Part of plan and rear elevation of additions to a frame house. Note dotted lines on plan which show parts of old building to be removed; all new construction shown solid. Scale $\frac{1}{16}$ in. = 1 ft.



The finish at the upper part of the building referred to above and shown in Fig. 20 illustrates the indication of the use of several materials to form the cornice and coping treatment in an important building. The horizontal band courses over the heads of windows, and also under main cornice and at A, are of brick. The vertical lines at B show vertical bands in the brickwork, either flush or projecting as would be shown by the plan except when, as at G, the projection is noted on the elevations, in this case being 2″.

The inset panels at D are marked "cut stone," and the note of "T.C." at E indicates that the latter are to be of terra cotta. The brickwork and cornice at the corner are carried higher than the main terra cotta cornice of the building, acting also as a support for the flagpole shown. The terra cotta panels at E and F in the cornice are indicated to have ornament.

Another type of building is shown by the plan of Fig. 21, this being part of the floor plan of an addition to a school building. This again was selected because of the advantage of showing both new and old work on the same plan. The exterior walls are dimensioned to be 22″ thick and are indicated of stone, with a total of 3″ of furring and plastering on the inside, making the wall 25″ over all. The windows are shown to have reveal frames. The walls forming the corridor are brick, noted 13″ thick, forming a fire barrier, as is also the 13″ brick wall between the stairs. These are dimensioned 15″, indicating plastering on either side directly on the bricks without any furring, as these are interior walls.

The stairs and landings are noted to be of cement, while the corridor connecting the stairs with the old building is noted "wood floor on concrete," with the additional note, "concrete slab with cinder fill between wood sleepers." Existing stairs at A are shown by the dotted lines to be removed. The existing walls of corridors and the stacks at B are shown to remain untouched, with notes calling attention to cutting out openings for the heat and vent spaces for the new rooms. In order to make it clear to the contractor, the removal of existing portion and necessary patching and resetting of blackboard at C are all fully noted. In the new room N, the wood joists are noted to be 3″ by 14″ yellow pine, 12″ on centers. In the same room the location of new

blackboards is noted, and also the location of electric light outlets.

The toilet room calls for cement floors, with all locations for toilet fixtures shown, and attention is called to the location of future water closets. Wood stud and plaster partitions are indicated as separating the compartments for toilets, and the arches over these are noted to be of "brick, plastered." Note that the interior brick walls are not furred, but are dimensioned 15", indicating that they are to be plastered directly on the brick itself. The door to room N is noted to be a sash door, with transom over.

All of the plans so far illustrated are necessarily only parts of plans, elevations and sections, and therefore quite incomplete. It has been only possible to point out the main features, together with a few of the minor details, in order to guide the student in each plan so that he may continue until he has picked out each part and fixed it in his mind.

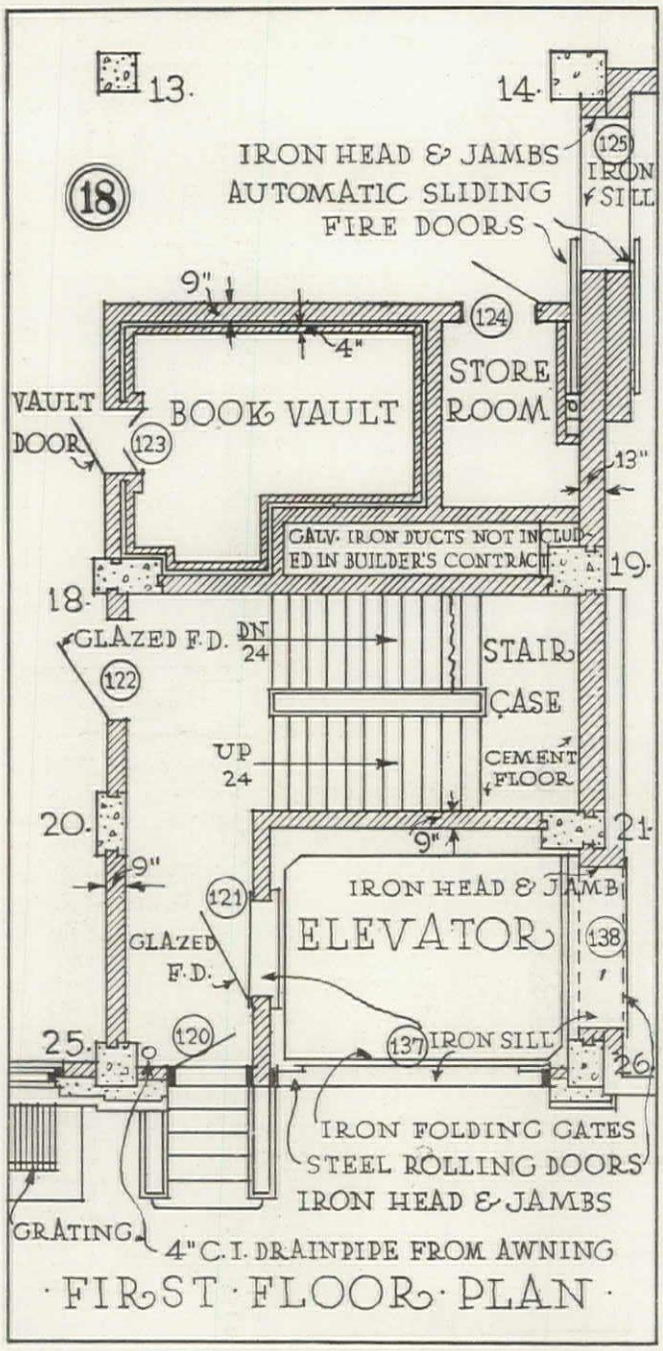
The blue prints of THE BUILDERS' JOURNAL WORKING DRAWINGS which are published in each number, including the 7-room house in this issue, are each complete sets of all necessary working drawings required for the purposes of securing estimates and then of constructing the building, except for the full sized sections through mouldings and larger scale details of special features. It being impossible to print in full a specification, the bill of material takes its place in describing the kinds of materials to be used where it is impossible so to indicate them on the drawings.

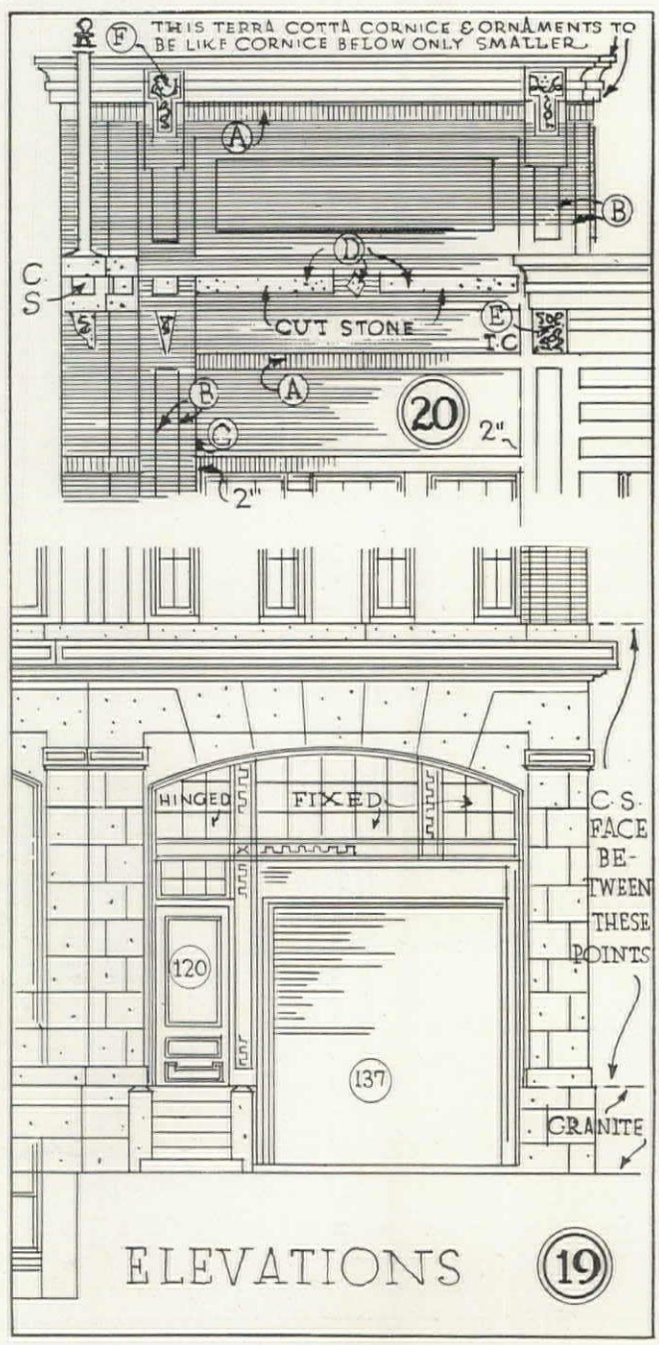
Each student should make a close examination of this set of plans and of those in preceding numbers, all of which are fully and carefully drawn. It is suggested that in this number he begin by reading the text matter accompanying the plans, by

Fig. 18. Part of plan of reinforced concrete office building. Note the concrete columns which are numbered and brick walls between

Fig. 19. Part elevation of lower story corresponding to plan in Fig. 18. Note indication of material and elevator and door arrangement

Fig. 20. Part elevation of top of building showing indication of different materials for the cornice. All scales ⅛ in. = 1 ft.





which he will realize the type of building.

He can then study the WORKING DRAWINGS themselves, beginning with No. 1, which shows the basement plan. The exterior walls are of concrete, 1′ thick, except at stairs, where it is 9″. The area walls and porch walls are also thinner. The chimney is of brick, with one flue lining showing in cellar. Joists are 2″ x 9″—16″ on centers. A stud partition separates the laundry from the other space, with sheathing on one side. Note the closets, bins and shelves called for.

Drawing No. 2 shows the first and second floor plans. The exterior walls are of frame, the only masonry work being brick chimneys with terra cotta flue linings, and the brick hearth to fireplace. The small terraces at sun porch and entrance have brick coping at the edges, the former having a cement floor and the latter being of brick laid in pattern as shown. In both cases the steps are of cement.

The opening between living room and hall is noted to be cased without any doors. An arch is called for at the coat closet in hall. Note how the sun porch is enclosed, having 3 pairs of doors, and 4 stationary sash. The door between dining room and kitchen is shown to be double swinging.

In the second story the wardrobe in bedroom 3 is divided into two spaces, one with a pair of doors, the other with one. There are no sash doors called for in the house, but the scuttle in second story is noted "gl," to be glazed. Note the other details shown, such as shelves in closets, table and settles in breakfast alcove, range with metal hood over and ceiling furred down, arches, etc.

The elevations in DRAWINGS Nos. 3 and 4 show the concrete foundations to stop at bottom of first floor joists. Above that to the first story ceiling are wide boards with battens covering the joints. The second story and gable ends are covered with "siding," which is clapboards or weatherboarding, as it may be variously termed. The eaves and barges have closed cornices shown. The roof is noted of slate, and in DRAWING No. 3 the chimney is shown plastered and so noted.

Hoods are shown over front door and over side door, both having metal roofs. Note that the windows

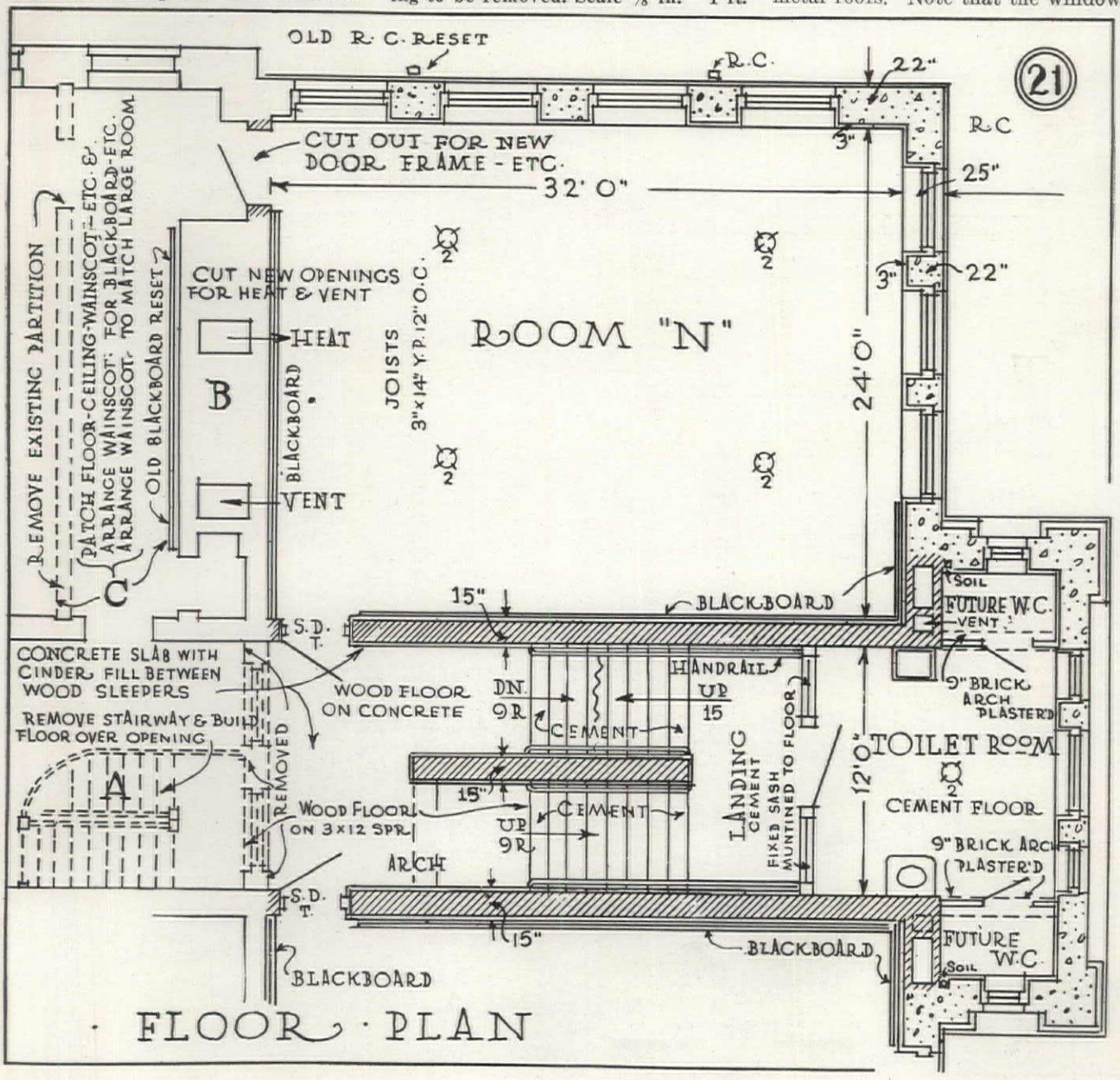


Fig. 21. Part of floor plan of addition to a school. Exterior walls of stone, interior walls of brick. Note indication of furring and parts of old building to be removed. Scale ⅛ in. = 1 ft.

are lettered, indicating the number of different sizes, each of the same letter being similar in size and arrangement. The louvres over "package door" are sloping slats, fixed for ventilating purposes. Note that all second story windows have 2-panel blinds with pierced cut-outs in upper panels, except circular headed window on one side.

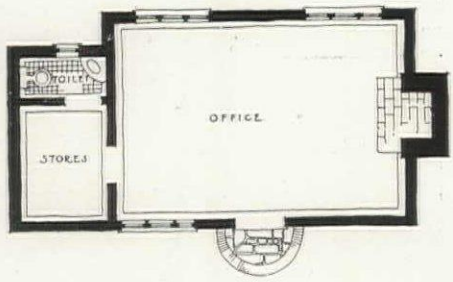
DRAWING No. 5 illustrates the type of construction, containing a section through the exterior wall of the building at the left hand side. This shows a 4″ x 6″ girt on top of the studs of first floor, to carry the second story joists. The second floor construction is 2″ x 9″ joist, plaster ceiling and double flooring. Note the firestopping at second floor level. The exterior wall consists of stud, with plastering on inside directly on the stud. On the outside there is a layer of sheathing, then building paper of the kind shown in the bill of materials, and on this the exterior facing of boards or siding as the case may be.

On this drawing the cornice, front door and hood, with its plaster soffit and face, the bay window with its construction and the support of joists and studs over concrete foundations are all shown and carefully noted. Among the details which must be watched during the construction of this building is the metal roof over bay, which is shown in the detail to lap over the front of cornice and turn up behind the siding. In the lower left hand corner the size of the battens covering the vertical sheathing boards of first story and their arrangement are shown, as is also the detail where the sheathing and battens end and the siding begins. Even the pitch of the roof is shown in the upper left hand corner.

The mechanical equipment, being the plumbing, heating and electric work, has not been referred to in this plan, as in any of the others. This will all be gone into in detail in the next article, which will be devoted entirely to those portions of the work and their indications on plans.

A Suburban Real Estate Office

Advertising with real sales value that marks the concern as one of distinction



THE builder and real estate developer needs to advertise fully as much as any progressive merchant. There is perhaps no more effective way than tying his name up with work that he does, because everyone is interested in new buildings. Every builder knows how many people enjoy walking through a development; they may not be actual buyers at the time, but their interest means something. Some mark by which they may identify your work will impress their minds, and returns are likely to come from many unexpected directions.

The real estate office shown here is a particularly good example of a permanent advertisement. It is the office of Harvey Craw at Great Neck, Long Island, N.Y., and was designed by Frank J. Forster, architect, to give an impression of Mr. Craw's business. His name is plainly displayed in an artistic manner, and it is safe to say that no one passes this building without noticing it, and further, that if anyone is interested in owning a distinctive home he is not going to overlook an opportunity of seeing Mr. Craw's houses.

THE BUILDERS' JOURNAL PLANS

A Series of Practical Designs for Small Houses Published in Complete Working Blueprint Form with Quantity Survey of Construction Materials Needed for Estimating Purposes

NUMBER THIRTEEN

A SEVEN-ROOM FRAME HOUSE

Designed by

GORDON ROBB

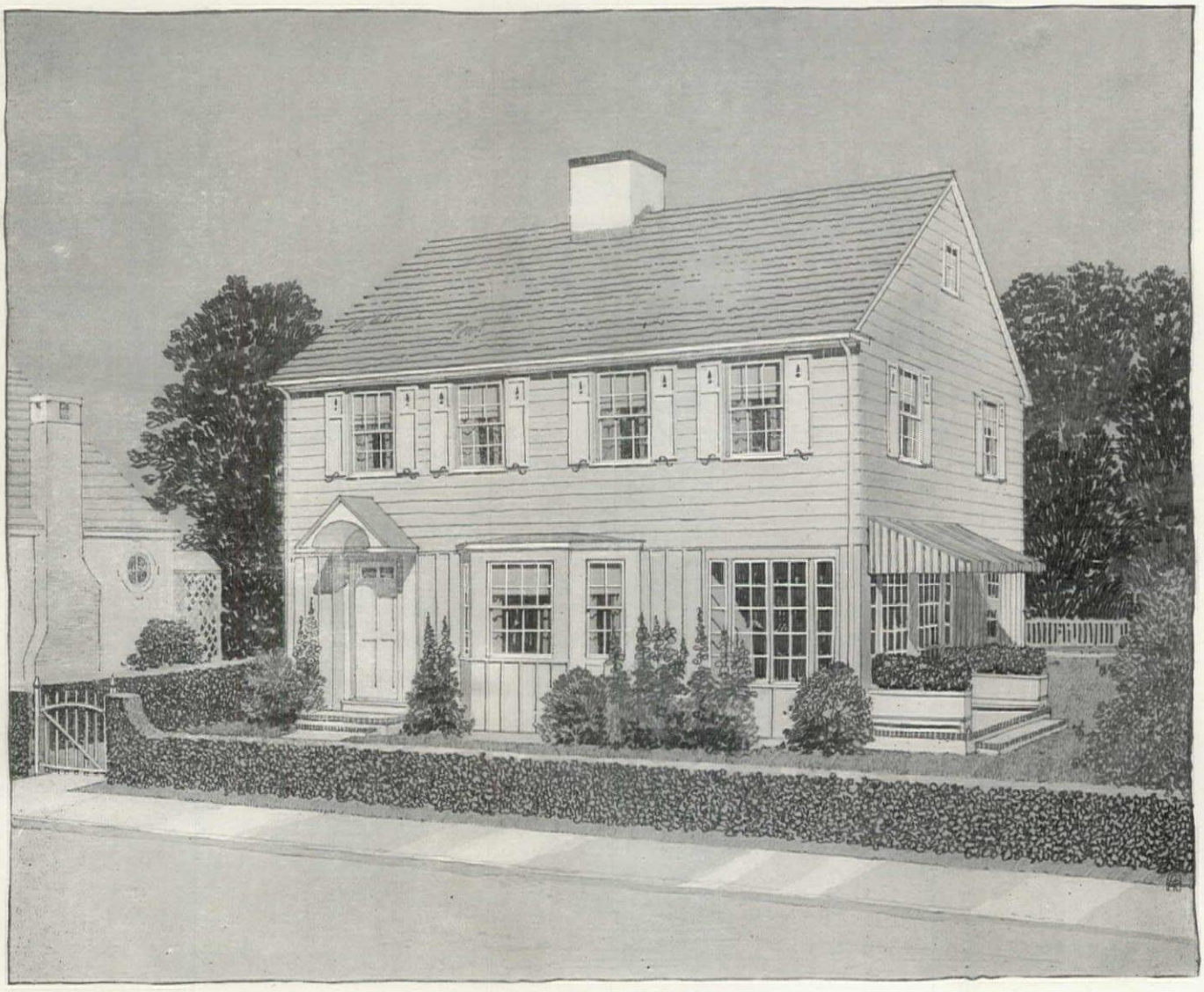
Architect for THE BUILDERS' JOURNAL

TO many people who like the general appearance of the colonial house, but who object to its rather formal and stiff arrangement, this little house will have an appeal because it combines the dignity and homelike qualities of the colonial with a picturesque character that gives it an individuality which is particularly desirable these days when the colonial has become such a popular type.

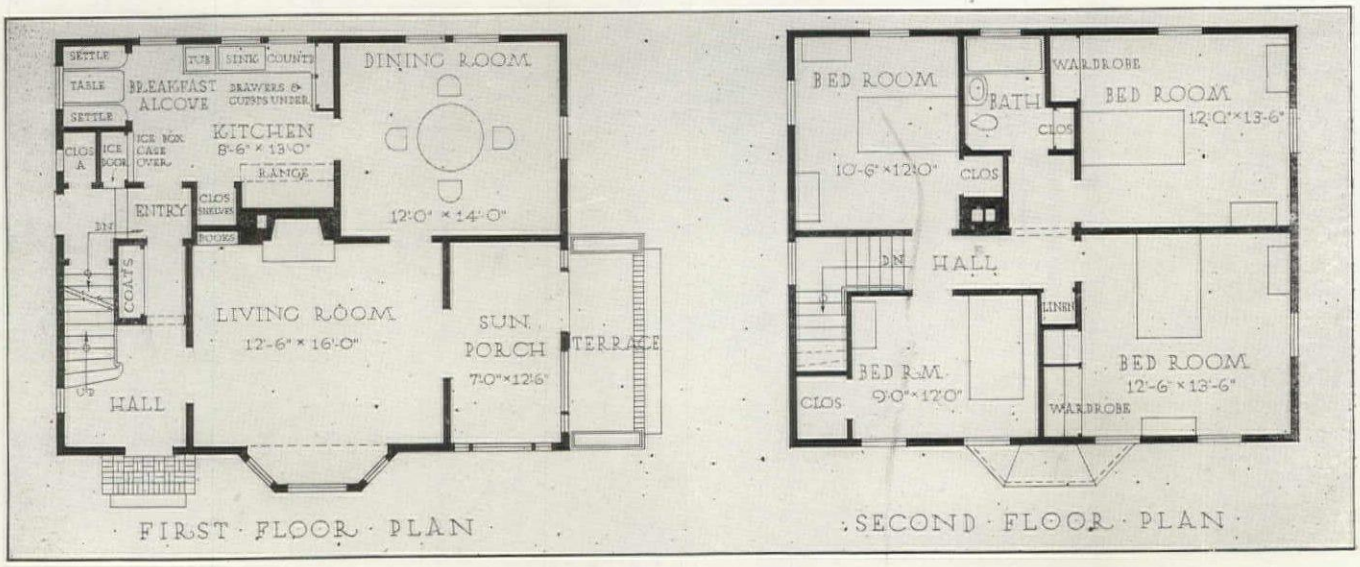
From the standpoint of construction it is especially economical, because it is contained in a rectangle without any breaks, 32 ft. on the front by 26 ft. deep. It has a simple pitched roof without any dormers or expensive valleys. An unusual note is introduced on the first floor by the use of wide boards and battens and the regulation siding for the second floor. The inside chimney is so placed that a fireplace is available in the living room, and also a coal range in the kitchen. Being inside, cheaper brick may be used, and it furthermore prevents the loss of heat which is one of the defects of the outside chimney as it is largely used today.

The first floor shows an attractive arrangement of living room, dining room and sun porch. A flat terrace outside the sun porch is intended to increase the usefulness of this room in the summer.

Particular note should be made of the kitchen. In the first place, the outside entrance serves both kitchen and cellar, and from the landing the refrigerator is iced and the supplies reached from the kitchen side. Adjoining this is a breakfast alcove, fitted with table and two settles. A sink, one tub and wide counter space are grouped in one corner with a kitchen dresser and various closets.



THIS house shows a picturesque handling of the colonial style that gives it individuality. The wide boards with vertical battens on the first story give a "different" note. The rectangular plan and simple pitch roof insure economy in construction. Note the modern kitchen with every convenience for the housekeeper. Regulation ¼ - in. scale plans are available at moderate cost. Mr. Robb will answer any questions that may arise in estimating or building, addressed to THE BUILDERS' JOURNAL.



Quantity Survey

By Frederick H. Hunter

THE quantities listed here are for estimate purposes. All measurements are NET unless otherwise noted. Quantities such as sheathing, flooring, roofing, etc., are given by area with no allowance for wastage, matching of lumber, etc. Minor outs are disregarded. No attempt has been made to include all the small items nor such items as clearing the site, drains, supplies, etc., which must be governed by local conditions. Where the word "Item" appears in the quantity column it indicates that the expense of the work in question would probably be set as a lump sum based on data available at the time.

Strip loam; about 10 ft. around site—assuming loam to average 8 ins. deep — 63 cu. yds.
Excavation for cellar — 227 cu. yds.
Excavation for footings, areas, piers, etc. — 15 cu. yds.
Concrete for foundation — 38 cu. yds.
(*See inside back cover*)
Forms for foundation; (contact area) — 2140 sq. ft.
Form trowel wash for basement sills — 18 lin. ft.
Concrete cellar floor — 84 sq. yds.
Common brick for chimney, rough fireplace and trimmer arch — 120 cu. ft.
(At 20 per ft. this is 2½ M)
(*See p.* 53)
Face brick for kitchen chimney breast — 350
(*See p.* 51)
Earth fill for porch and front steps; rammed — 10 cu. yds.
Concrete underbody for brick and tile paving and steps — 1 sq. yd.
Hard burned brick for porch and steps — 120
Cement floor for terrace — 7 sq. yds.
Concrete steps; (include forms and finish) — 17 lin. ft.
Concrete threshold at side door — 3 lin. ft.
Hammered finish for exposed foundations — 18 sq. yds.
Firestopping; it would require about 1½ M brick to firestop — Item
8 x 12 flue lining — 66 lin. ft.
Thimble pieces, included in above — 2
Metal thimbles for smoke pipe — 2
Cast iron clean out door and frame — 1
Finished fireplace; (brick for rough fireplace and trimmer arch included in previous item for chimney)
Damper for 40" opening — 1
Mantel bar; (unless patent damper, which forms lintel, is used) — 1
Face brick for facing lining under fire and hearth — 220
(*See p.* 51)
Framing lumber
(*See back cover*)
There are no especially long lengths needed; no joist over 16' 0". Lengths are scheduled "to the next whole foot." That is, a piece 14' 4" is counted 15' 0". Lengths allowed for splices in sills, plate, ridge, etc. Schedule is for a girt frame.
2 x 9 sill — 180 ft. b. m.
2 x 9 floor joists — 2260 ft. b. m.
2 x 8 rafters, 17 ft. long; (ridge included) — 1200 ft. b. m.
2 x 6 ceiling joists — 700 ft. b. m.
Wall framing; 2 x 4s, 16" o. c. Include in price for plate of 2 x 4s doubled, usual bracing, etc. No outs taken for windows or doors on account of doubling and trussing — 2300 sq. ft.
TOTAL CARRIED FORWARD

TOTAL BROUGHT FORWARD
4 x 6 girt — 220 ft. b. m.
4 x 8 y. p. girder — 27 ft. b. m.
Cross bridging of 1 x 2 stock — 120 lin. ft.
2 x 4 stud partitions with 3 x 4 y. p. cap and one row of herring-bone bridging; lengths measured to girder or partition cap below and no outs deducted — 730 sq. ft.
3 x 4 y. p. sole piece for bearing partition in basement — 24 ft. b. m.
Non-bearing partitions of 2 x 4s or 2 x 3s; (include cap, sole and bridging) — 1360 sq. ft.
2 x 12 and smaller stock for stair stringers and framing — 175 ft. b. m.
Wall sheathing — 1860 sq. ft.
Roof sheathing — 1112 sq. ft.
Underfloors; square edged boards — 1530 sq. ft.
Attic floor; (if any) — 651 sq. ft.
Strap furr ceilings with matched boarding, 1 x 2, 16" o. c. for lath; (if sized timber is used, omit this item) — 1550 sq. ft.
Allow for miscl. furring and blocking — Item
Plank floor for landing — Item
Stud and board for false chimney — Item
Build curb for roof scuttle — Item
Joist hangers;
4 x 9 over 4" — 7
2 x 9 over 4" — 4
Roof slate — 11 sqs.
Ridge — 29 lin. ft.
Cap and under-flashing around chimney — 17 lin. ft.
Flashing over windows — 16 lin. ft.
3½" hung metal gutter — 66 lin. ft.
Ends for gutters — 4 lin. ft.
2½" metal leaders — 72 lin. ft.
Goosenecks and bends — 4
Footing pieces; iron or Akron pipe — 4
Glazed roof scuttle; include hardware, covering curb, etc. — Item
Metal top for false chimney — Item
Exterior windows
Cellar windows; 2-lt., 10 x 14 — 2
Cellar windows; 3-lt., 10 x 14 — 5
18-lt., d. h. 11 x 12; arch top — 1
16-lt., d. h. 10 x 12 — 1
12-lt., d. h. 10 x 12 — 1
8-lt., d. h. 10 x 12 — 2
2 12-lt., d. h. 10 x 12, in mullion frame — 1 unit
12-lt., d. h. 10 x 11 — 10
12-lt., d. h. 8 x 9 — 2
12-lt., d. h. 8 x 9, in mullion frame — 1 unit
2-10-lt., 10 x 12 casement sash 2-5-lt. side lights — 1 unit
Similar window with one side light — 1 unit
4-lt., 7 x 9 casement — 3
Stock blinds for 12-lt., 10 x 11 — 9 pr.
Stock blinds for 12-lt., 8 x 9 — 1 pr.
TOTAL CARRIED FORWARD

TOTAL BROUGHT FORWARD

Exterior doors; (include frames)
- Front door, 3′ 2″ x 6′ 8″; glazed; 4 panels under — 1 unit
- Pair French doors, 2′ 0″ x 7′ 0″; glazed; 10-lt. with panel under, with 1 side light 5-lt. 7″ x 12″ — 1 unit
- Side door, 2′ 8″ x 6′ 8″; two panels; 6 lts. over — 1
- Special door and vent to closet A — 1 unit

Exterior finish
(*See p.* 57)
- Main cornice — 70 lin. ft.
- Cornice of bay — 13 lin. ft.
- Rake boards for gables — 68 lin. ft.
- Siding, 9″ to the weather, and sheathing paper — 1120 sq. ft.
- Kick strip under siding — 108 lin. ft.
- Vertical boarding of cypress; 10″ to 14″ widths, with 7/8″ x 1 3/4″ battens; include for sheathing paper under — 675 sq. ft.
- Hood over front door — 1 unit
- Hood over side door — 1 unit
- Apron under exterior threshold — 1 unit
- Flower boxes for terrace — 2

Interior doors
(*See pp.* 4 *and* 57)
- 2′ 2″ x 6′ 8″ — 1
- 2′ 2″ x 6′ 8″; glazed — 2
- 2′ 4″ x 6′ 8″ — 3
- 2′ 6″ x 6′ 8″ — 6
- 2′ 6″ x 6′ 0″ — 1
- 2′ 8″ x 6′ 8″ — 2
- 1′ 6″ x 6′ 8″ — 1
- Frame for pairs — 1
- Frames for singles — 14

Interior finish
(*See p.* 64)
- Trim with mitered angles — 1050 lin. ft.
- Curved trim for arched head — 6 lin. ft.
- Mullion casings — 31 lin. ft.
- Jamb and soffit for cased opening — 18 lin. ft
- Window stools and aprons — 98 lin. ft.
- Stop beads — 192 lin. ft.
- Head stops — 66 lin. ft.
- Base — 458 lin. ft.
- Chair rail — 94 lin. ft.
- Moulded beam for arch beside stairs; 1st story — 5 lin. ft.
- 4″ x 4″ posts under beam — 2
- Half-post — 1
- Small sawed brackets — 4
- Panel between posts — 1
- Canvas dado — 34 lin. ft.
- Mantel in living room — 1 unit
- Shelf and hook strips and pole for coat closet — 1 unit
- Shelves, hook strips and poles for second floor closets — 2 units
- Shelving in kitchen closet — 1 unit
- Double wardrobe in bedroom 3; include case doors — 1 unit
- Wardrobe in bedroom 2; include case doors — 1 unit
- Case door, shelves and drawers for linen closet — 1 unit
- Case doors and shelving for bathroom closet — 1 unit

TOTAL CARRIED FORWARD

TOTAL BROUGHT FORWARD
- Glazed ceiling scuttle — 1
- Case opening to scuttle — 9 lin. ft.
- Picture moulding — 445 lin. ft.
- Case B over ice box — 1 unit
- Case C in kitchen — 1 unit
- Counter and sink frame in kitchen — 1 unit
- Cover for set tub — 1
- Built-in settles in breakfast alcove — 2
- Table in alcove — 1

Front stairs and steps to side door
- Treads about 3′ 4″ long; moulded ends — 3
- Treads about 3′ 4″; with closed ends — 8
- Special treads; curved ends — 2
- Nosings for landing and top step — 3
- Risers 3′ 4″ long — 14
- Special risers; curved — 2
- Skirt board at wall — 22 lin. ft.
- Posts — 1
- Balustrade — 3 lin. ft.
- Start and easement — 1 each
- Rake string for open end — 3 lin. ft.
- Well rail — 7 lin. ft.
- Starts for wall rail — 2
- Bend for wall rail — 1

Hardwood floors for living room, hall, dining room and sun porch; include sheathing paper — 540 sq. ft.
- Floors for rest of house — 960 sq. ft.

Cellar stairs
- Plain treads, about 3′ 0″ long — 9
- Tread with rounded end — 1
- Plain risers — 9
- Curved riser at foot — 1
- Railing — 8 lin. ft.
- Post — 1
- Batten doors, 2′ 6″ wide — 2
- Batten door, 2′ 10″ wide — 2
- Plank frames for doors — 3
- Stud for partitions around coal bin and closets — 210 sq. ft.
- Sheathing for basement partitions — 310 sq. ft.
- Shovel hole and slide for coal bin — 1
- Frame and cover for 2 laundry trays — 1 unit

Plastering interior;
(*See pp.* 3, 61 *and* 63)
- Ceilings — 168 yds.
- Basement ceilings; (if plastered) — 83 yds.
- Stair soffits — 7 yds.
- Walls — NET 409 yds.
  (Or half outs, 470 yds.)
- Dado in kitchen and bathroom; (4 ft. high) Cement plaster on metal lath — 20 yds.
- Corner beads — 177 lin. ft.
- Stucco for false chimney — 4 yds.
- Metal hood and register over kitchen range — Item

Insert sub-bids for other trades:

Hardware
(*See pp.* 4 *and* 57)
- Allow for setting hardware — Item

Painting
(*See pp.* 59)

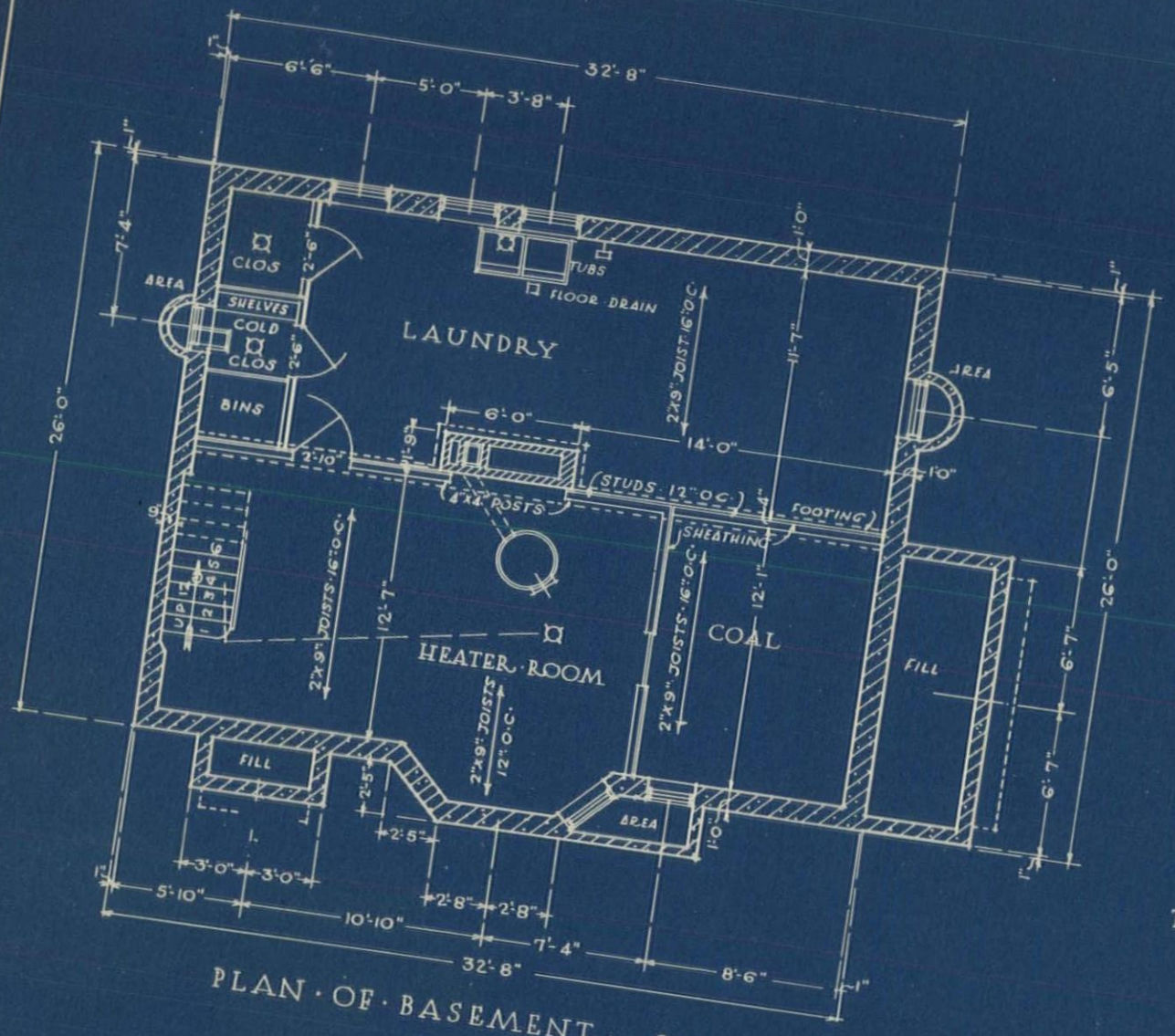
Plumbing

Heating
(*See p.* 2)

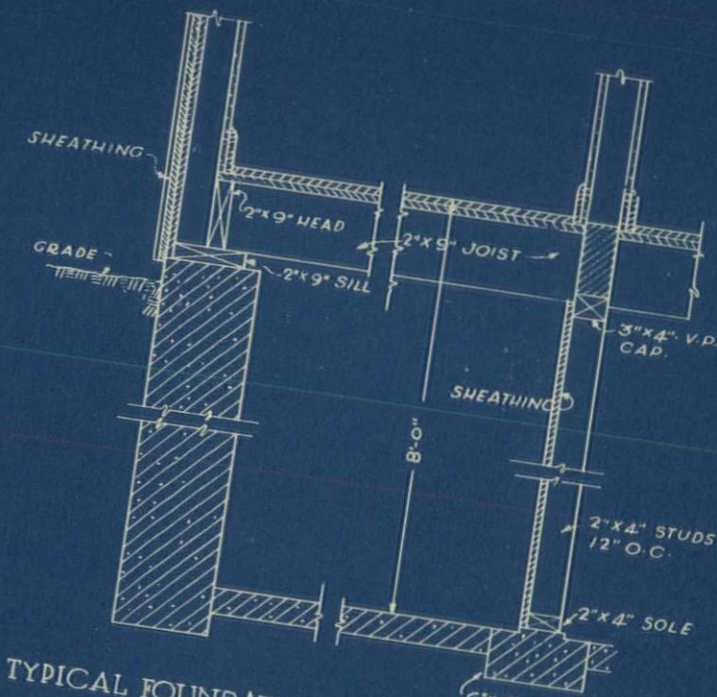
Electric work

Fixtures

TOTAL AMOUNT



PLAN · OF · BASEMENT · SCALE · 1/8" = 1'-0"

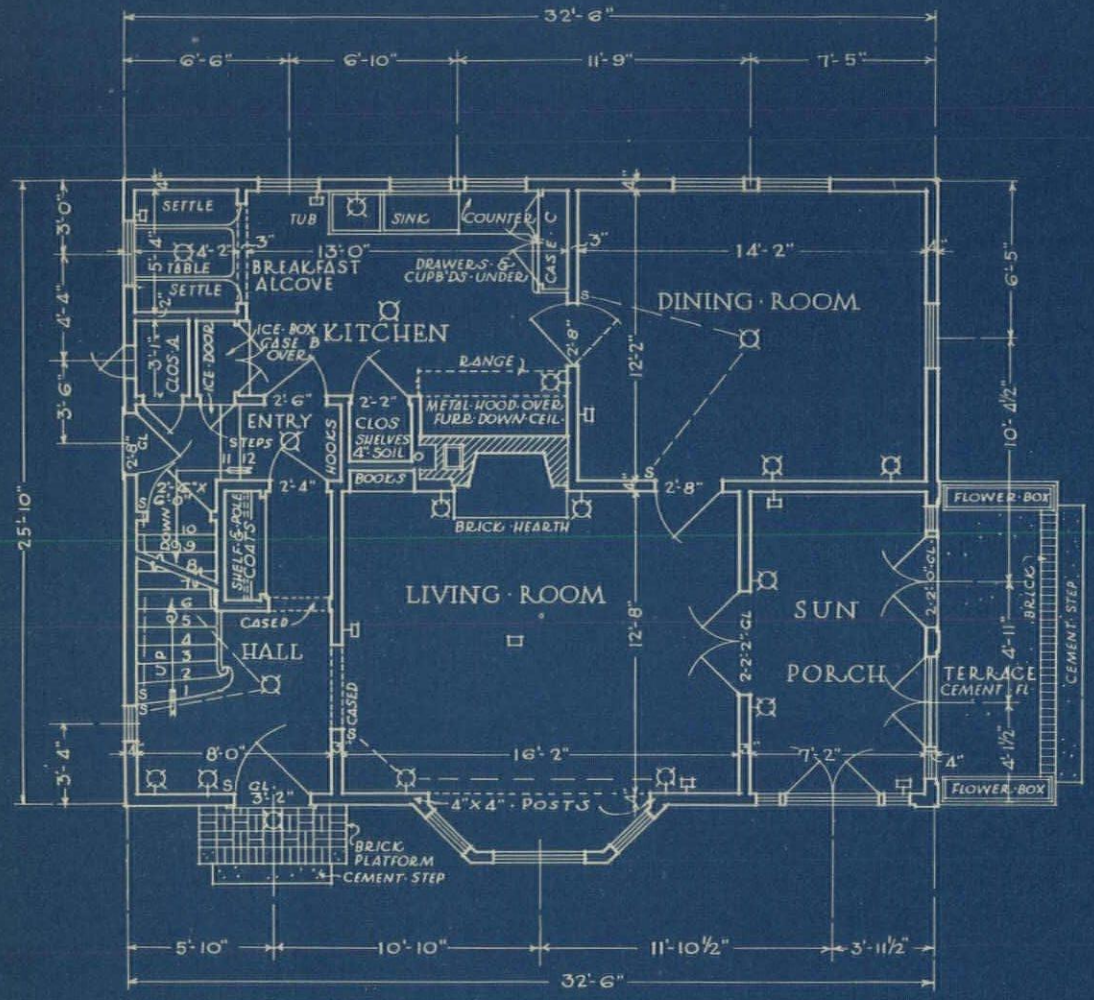


TYPICAL FOUNDATION
INTERIOR BEARING PARTITION
SCALE 1" = 1'-0"

A SEVEN ROOM HOUSE

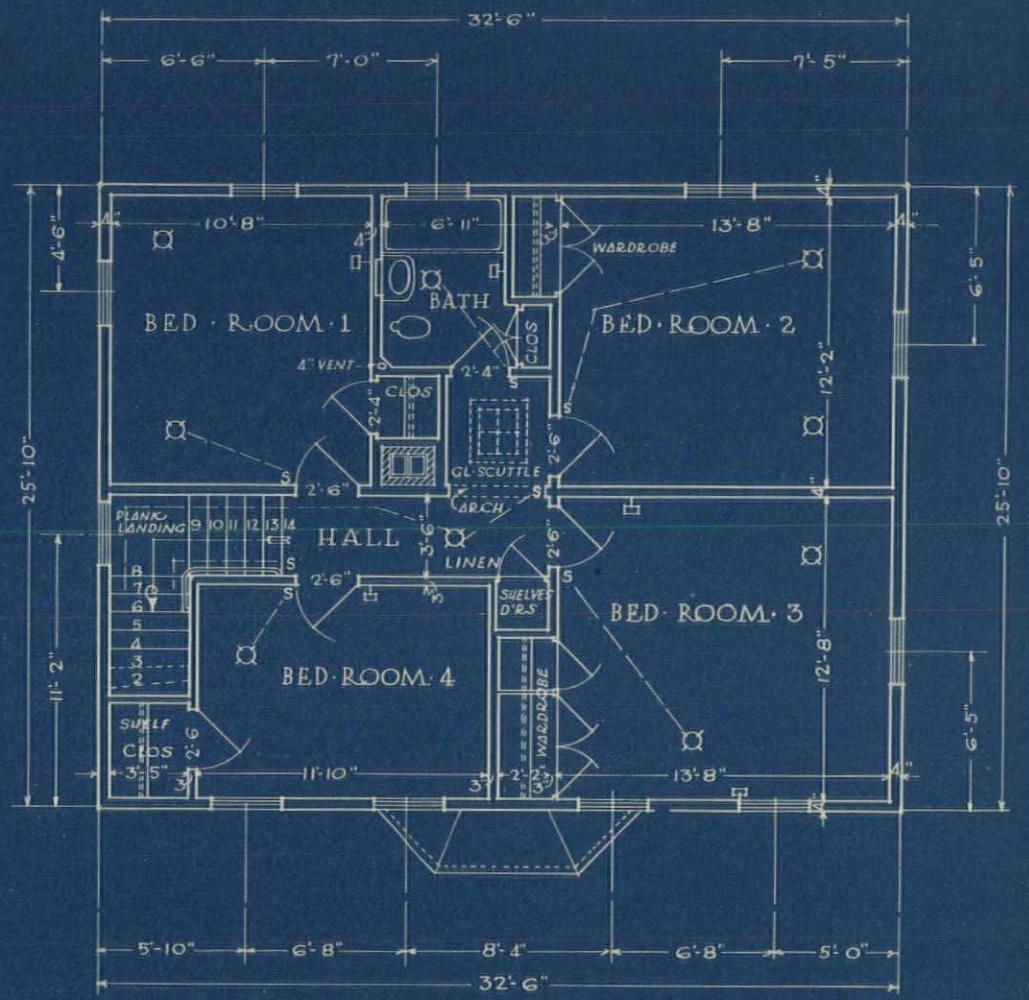
The BUILDERS' JOURNAL WORKING DRAWINGS

DRAWING NO. ①



PLAN · OF · FIRST · FLOOR

SCALE · ⅛" = 1'-0"

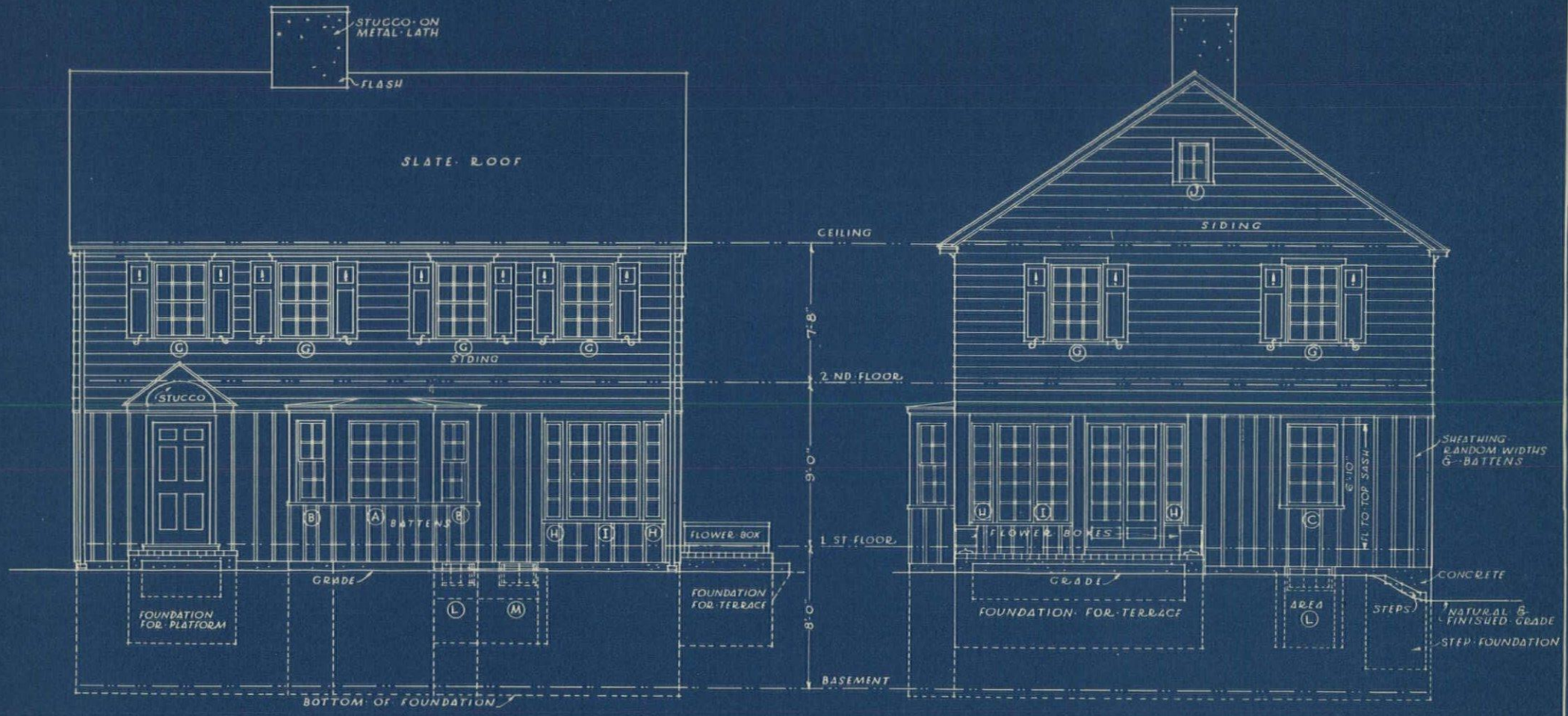


PLAN · OF · SECOND · FLOOR

NOTE · ALL · DIMENSIONS · TAKEN · TO · FACES · OF · STUDS
DOORS · 6'-8" · HIGH · UNLESS · OTHERWISE · NOTED ·

DRAWING NO. ②

A SEVEN ROOM HOUSE	The BUILDERS JOURNAL WORKING DRAWINGS	NO. 13 MAY 1921



ELEVATION OF FRONT

SCALE 1/8" = 1'0"

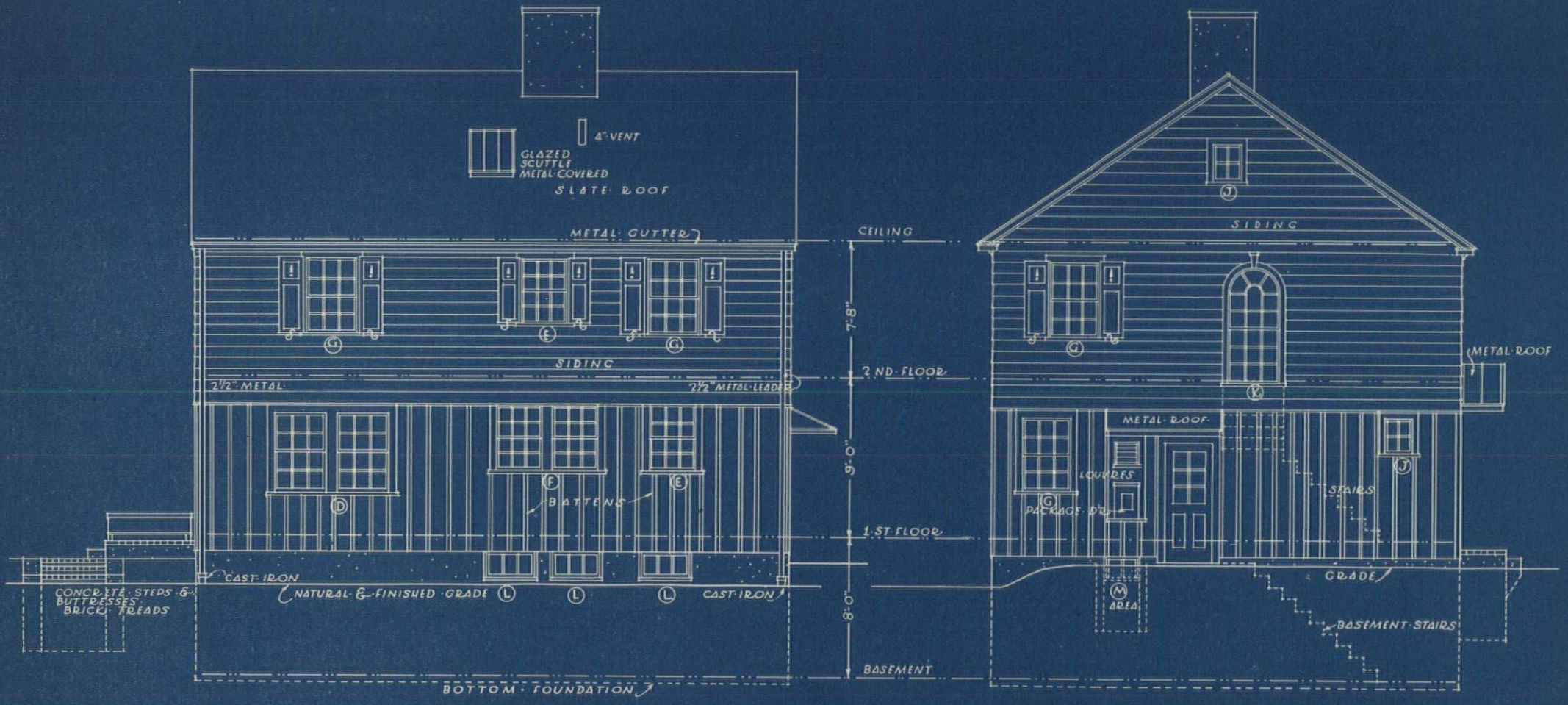
ELEVATION OF SIDE

DRAWING NO. ③

A SEVEN ROOM HOUSE

The BUILDERS' JOURNAL WORKING DRAWINGS

NO. 13
MAY 1921



ELEVATION OF REAR

SCALE 1/8"=1'-0"

ELEVATION OF SIDE

WINDOW SCHEDULE

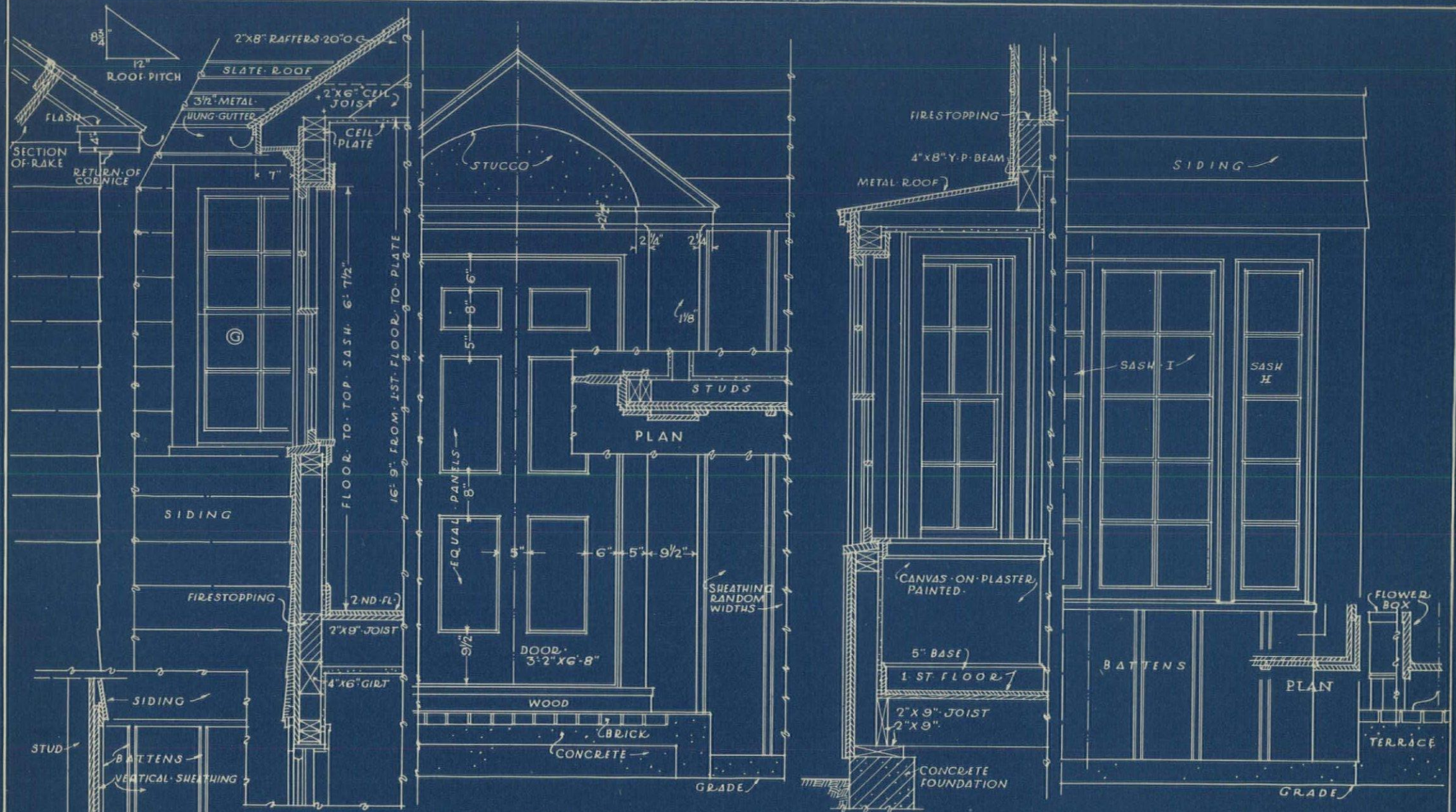
A	D.H.	10X12	GLASS	
B	" "	"	"	"
C	" "	"	"	"
D	" "	"	"	DOUBLE FRAME
E	" "	8 X 9	"	"
F	" "	"	"	DOUBLE FRAME
G	" "	10 X 11	"	"
H	FIXED	10X12	GLASS	
I	PAIR CASEMENT	10X12	GL.	
J	SINGLE	"	7X9	"
K	D.H.	11X12	GLASS	
L	BASEMENT	10X14	GL.	
M	"	"	"	

DRAWING NO. 4

A SEVEN ROOM HOUSE

The BUILDERS' JOURNAL WORKING DRAWINGS

NO. 13
MAY 1921

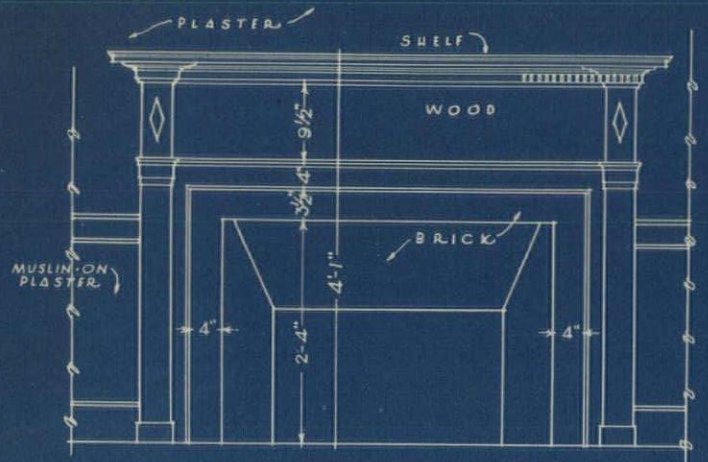


CORNICE & WALL SECTIONS & DETAILS OF SHEATHING & BATTENS

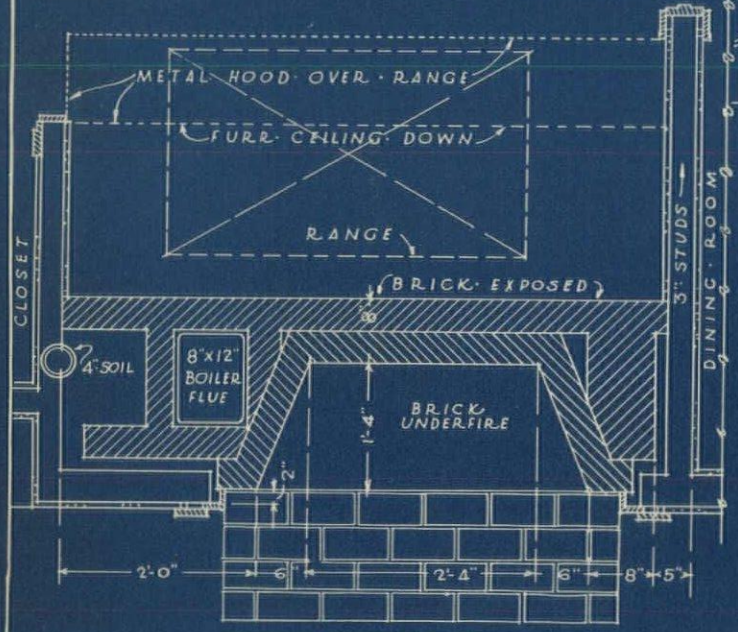
EXTERIOR DETAILS

SCALE 1/2" = 1'-0"

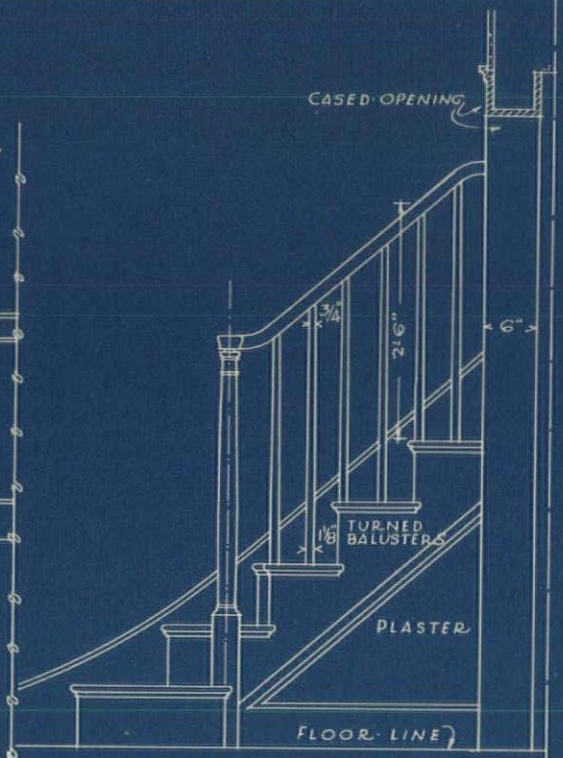
DRAWING NO. ⑤



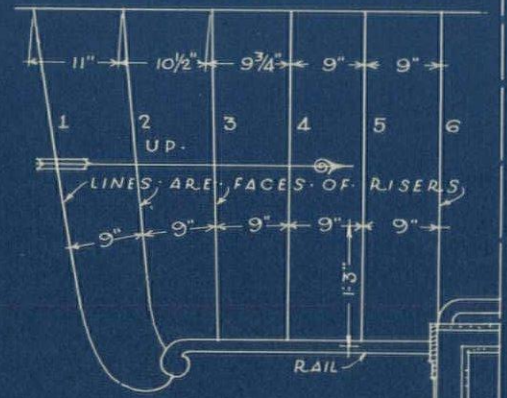
ELEVATION



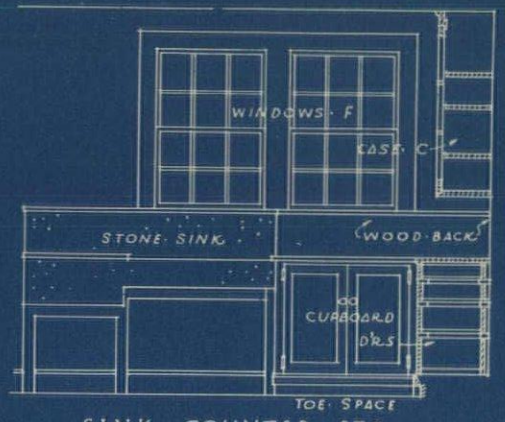
PLAN
FIREPLACE



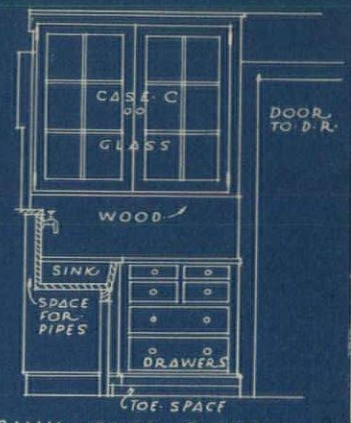
ELEVATION



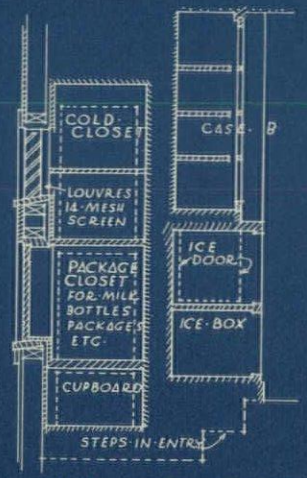
PLAN
STAIRWAY



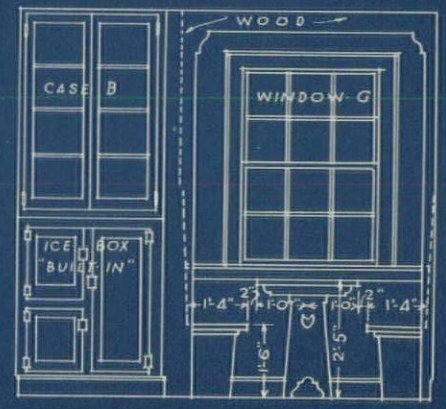
SINK · COUNTER · ETC ·
ELEVATION · AT · "A"



SINK · CASE · C · ETC
ELEVATION · AT · "B"



CASE · A · ICE · BOX · ETC ·
SECTION · "C"



ICE · BOX · CASE · B · & · BREAKFAST · ALCOVE
ELEVATION · AT · "D"

SCALE · ¼" = 1'-0"

DETAILS · OF · SERVICE · PORTION

INTERIOR · DETAILS

SCALES ½" = 1'-0" & ¼" = 1'-0"

DRAWING No ⑥

MASONRY
Practical Information on Materials and Latest Construction Methods

Hollow Tile for Factory Buildings

By J. J. Cosgrove

THE last twenty years have seen a complete revolution in the design and construction of American industrial buildings. Twenty years have likewise witnessed a complete change in our "infant industries." No longer are they wearing swaddling clothes and creeping cautiously along with whatever encouragement they can get from citizen and state; on the contrary, with giant-like strides they are spreading out to supply the markets of the world.

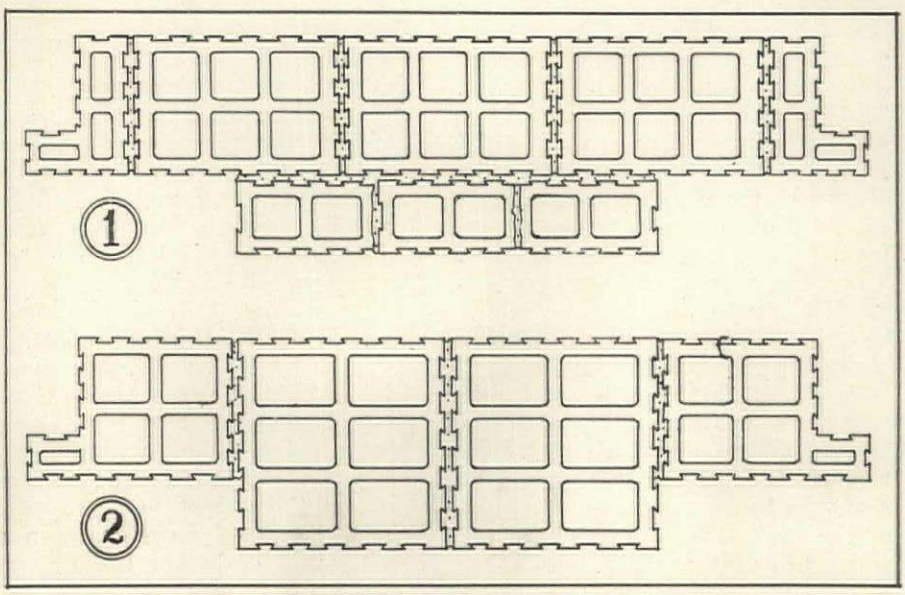
In the early days of industry workshops sprang up wherever they were needed. Those which were successful in the course of time put out additions, added story upon story, and by an expanding process of evolution finally became factory buildings. But from the very nature of their growth they were unsatisfactory. They were not designed for the movement of the manufactured article in a continuous line from the raw material yard to the shipping platform, and the motion lost in passing through the plant adds enough to the cost of manufacture of certain products to make difficult their sale on a competitive basis. The present is essentially the Age of Industry. Vast plants which cover hundreds of acres of land have taken the places of hundreds of small scattered shops and factories, and these industrial plants are designed to turn out in the most economical manner the article manufactured.

Most of the early shops were of wood. Some, where stone was plentiful and mason work cheap, were of masonry as far as the walls were concerned. Even many of the later factories were partly or wholly of wood, and there was developed a system of framing timbers for factory buildings which was known as "mill construction." The present trend is away from frame and towards fireproof building. Concrete, steel, hollow tile and other forms of non-combustible material have taken the place of the wood and stone of the earlier types of buildings. There are many reasons for this. Within the fire limits of cities, and most industrial buildings, somehow, are within the confines of cities, the fire laws will not permit the erection of industrial buildings of combustible materials. This fact limits the construction of industrial buildings of non-fireproof materials to suburban and other areas outside city fire limits, but even then the laws of economics intervene so that in most cases it is cheaper to build of fireproof construction than of wood, when upkeep, insurance and other items of overhead are considered.

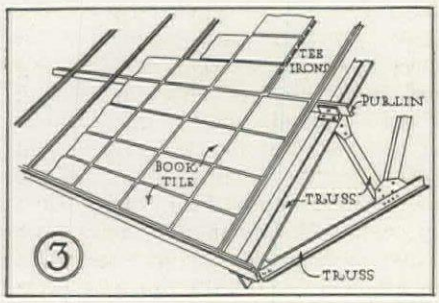
Take, for instance, the item of depreciation. The yearly depreciation of a frame factory building will vary from 1 to 1½%. Depreciation in a fireproof building, on the other hand, is confined largely to the door and window openings and roof. While of course there is wear and tear on all parts of the building, the effect from a practical standpoint, so far as its use is concerned, is almost negligible, amounting perhaps to no more than one-quarter of 1%.

Among industrial buildings may be classed public garages, and it is public knowledge that public garages are springing up like mushrooms in cities all over the country. If there is any type of building which more than another needs to be fireproof, it is the garage.

Hollow tile has been used extensively during recent years for the construction of industrial buildings. Its use has not been confined, as might be supposed, to the fireproofing of steel members, the building of curtain walls and forming of floor arches and floor slabs, but has been extended to the bearing walls and partitions. There are no details of construction in a hollow tile factory building or other structure which differ from like construction in other types of large, heavy buildings. It is the adaptability and suitability of the material which commend it



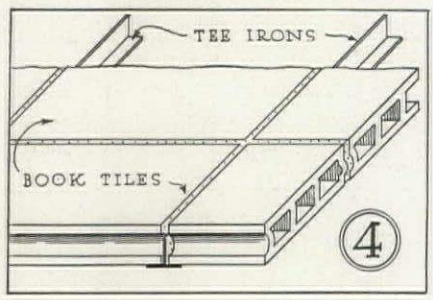
to consideration. Take, for example, the walls of an ordinary factory building. Light — daylight — is of the utmost importance within, if the best results are to be had from the operatives. That means large and ever larger windows which cut up the walls into a series of pilasters and huge window openings. The heating of such an industrial building in winter weather is not only an important consideration, so far as the workmen are concerned, but it is a big drain on the exhaust steam which sometimes is urgently needed for industrial operations. The more windows or window space in a wall, the greater the amount of steam condensed; and the looser the windows and sash, the greater the leakage of air and corresponding consumption of steam.



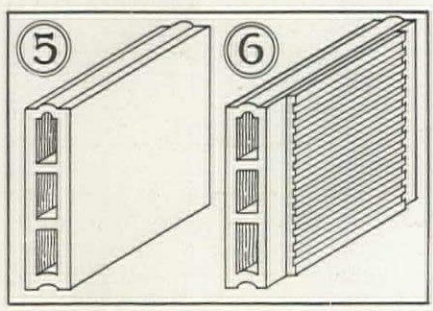
Window area has far greater condensing surface than wall area, and the relative condensation of wall surface depends upon the kind of wall. Hollow tile with its numerous air cells is an ideal heat insulator when laid up in a wall. In Fig. 1 can be seen a typical section of wall with a reinforcing abutment or pilaster spaced between two windows. In Fig. 2 can be seen the alternate courses of tile showing how the joints are broken. At each end of the section of wall can be seen the jamb tile for the windows, a half-tile at one end or on one course and full tile on the other. The section of wall shown in the two illustrations is a bearing wall. Roof trusses of steel generally rest on the centers of the pilasters, and purlins extend from truss to truss to support the rafters of the building. The use of pilasters on factory walls frequently permits the main wall to be of less thickness than a plain wall without pilasters.

In Fig. 3 is shown a portion of roof truss with purlins supporting T iron rafters on which rest book tile which form the surface of the roof. In Fig. 4 can be seen a detail of the roof slabs, and the book tile which are used as slabs.

The book tile used for roof coverings are made of porous material, when the finishing surface must be nailed. As already explained in THE BUILDERS' JOURNAL, to make the book tile porous, sawdust is mixed with the plastic clay which in due time is forced through a forming die on the end of an auger machine. The slabs or book tile are then fired in a kiln where the sawdust is destroyed by the intense heat. The porous material resulting from this treatment possesses the valuable property of being nailable, that is, nails can be driven into porous tile as readily as into wood, and they will hold equally well. The book tile shown in Figs. 3 and 4 form the nailing bases for the weather-proof roof coverings. A roof covering may be slate, Spanish tile, sheet metal, asbestos or wood shingles and all will hold firmly to



the nailing base. If instead of a pitch roof, as shown in the illustration, the factory building is covered

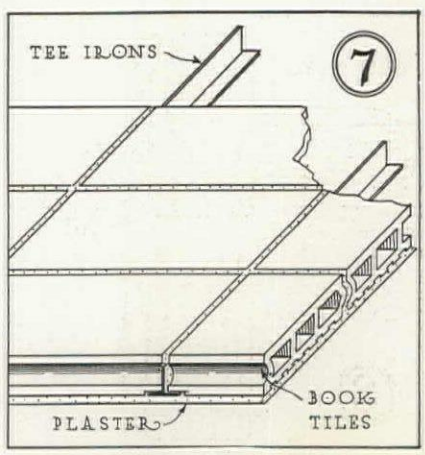


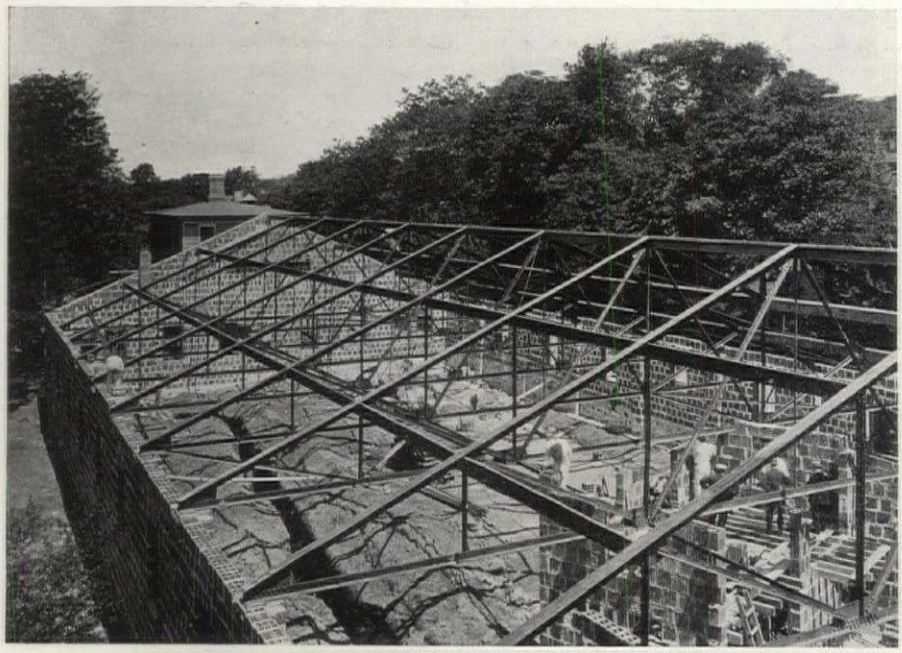
with a flat roof, which is to be covered in turn with concrete, tar and felt, or any composition roofing, the book tile are made of uniformly hard burned, dense material. It is only when the roofing material is to be nailed to the book tile that porous books are used.

A book tile of standard dimensions and shape is shown in Fig. 5. It is called "book tile" on account of its resemblance to a book. Such tile are made either 3 or 4 ins. thick, although 3 ins. is the standard thickness, and of a length depending very much on the weight to be carried. Wherever a roof truss rests on a bearing wall of hollow tile, or any other masonry material for that matter with the exception of concrete, cast iron or steel bearings should be at least 1 in. thick and of sufficient dimensions so that the pressure on the hollow tile will not be greater than 110 lbs. per square inch of sectional area under compression. Specifications for the steel framework of the roof should call for the spacing of T beams 1 in. wider than the length of the book tile; for example, for book tile 18 ins. long the T irons should be spaced 19 ins. from center to center.

When the book tile are to be used for roof surface only, and will not be plastered on the under sides, they are made with squared ends and smooth under sides as indicated in Fig. 5, and the book tile simply rest on the flanges of the T irons. When, on the other hand, the under sides are to be plastered or when the lower flanges of the T irons are to be protected, the book tile are rabbeted, as shown in Fig. 6, so that the bottoms of the tile will drop a little lower than the flanges. If the flanges of T irons are narrow, the plaster will cover them without trouble, but where the flanges are of considerable width, they should be wrapped with metal lath before the tile are set. In Fig. 7 can be seen a detail of book tile laid in a ceiling to be plastered underneath. It will be noticed by referring back to the book tile for ceilings that the under side is scored with dovetail grooves to form a clinch for the plaster.

When providing for future increase in height of a factory building, a common occurrence when forethought on the part of the management looks to the greater development and expansion of the plant, a floor of flat arches is set and a temporary roof construction of book tile is built over that. This temporary roof is given the necessary pitch to shed water, and when the building is finally increased in





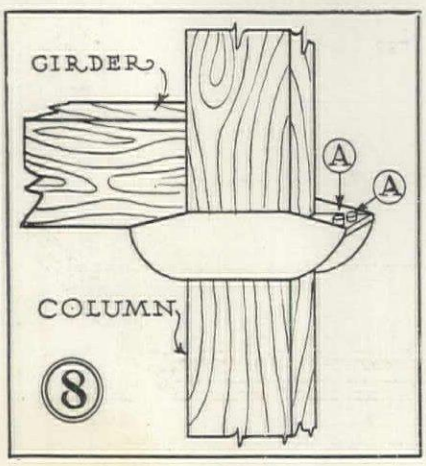
An industrial building with walls of end construction hollow tile, and steel roof trusses

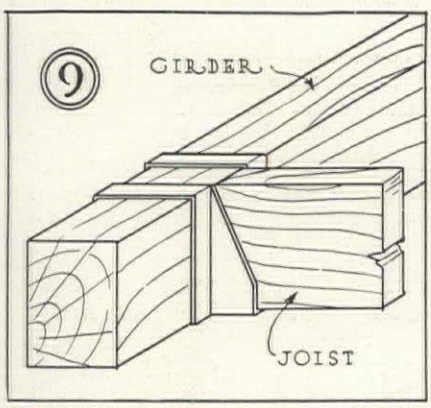
height the roof tile can be used over again to form a permanent roof.

So far, we have been considering hollow tile as a material for bearing walls only in factory construction. It is used, however, and very extensively, for curtain walls in industrial buildings. Further, when used for curtain walls, a texture type of block is commonly selected which has a plain surface with just enough wave or warp to take away the monotony of perfectly true surfaces. These blocks are generally of a pleasing tone or shade and their use will generally add much to the appearance of a building.

Getting good proportions is one of the fundamental necessities of good building, and the use of units of pleasing proportions in a wall adds materially to the effect of the whole. In the case of hollow tile blocks used for curtain walls, the proportions of the blocks are in harmony with the height and length of the wall and size of the structure.

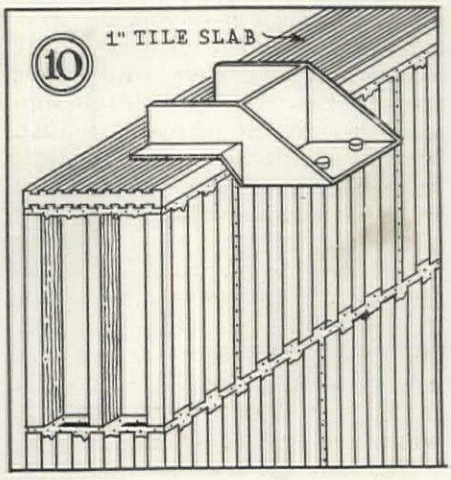
No treatment of the subject of hollow tile for factory buildings would be complete without some reference to its use in that very important feature of the power equipment, the smokestack. The subject is so important and so much might be written regarding it that little more can be done here than to call attention to such use for tile. Radial hollow tile are made for smokestack construction, and the air spaces in the blocks serve the same purpose as in the walls of a building. Hollow tile has not been used for this purpose to so great an extent as other materials, but there is a large field for its use here which the mason should not overlook.





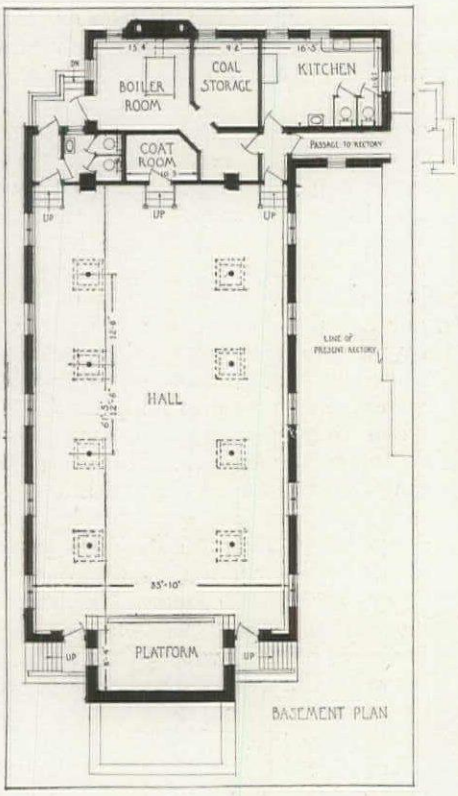
Standard wooden mill construction is frequently used for the floors of mills and factories having hollow tile walls. Mill framing consists of using heavy timbers, all supported in such a way that the interior could be completely destroyed by fire, the floors, beams, girders and columns fall, and yet the walls would not topple over unless the crashing timbers were deflected in such a way as to strike a wall. The floors are so laid and the joists, instead of resting on the tops of girders, are framed in between them and supported on iron or steel joist hangers. Wooden columns which support the floors have cast iron or steel post caps and bases, and the girders which support the floor joists at each story rest on these caps. A cast iron post cap and beam rest are shown in Fig. 8. The two dowel pins fit into holes in the beams, thereby tying the building together. The manner of supporting the joists from the girders by means of iron or steel hangers is shown in Fig. 9. It might seem like an expensive way to support joists, when they might just as well rest on top of the girders. However, the cost is more fancied than real. Dropping the joists between girders and supporting them on hangers saves about 16 ins. in the height of each story, and that economy in height more than offsets the cost of the hangers. Then, with joists framed between the beams or girders there are fewer corners and projections exposed to fire.

In Fig. 10 is shown how beams and girders are supported by the walls. Instead of resting on the wall, or on a bearing projecting into the wall, the end of the beam or girder rests on a hanger which in turn depends for its support on the wall. It will be readily seen that with this form of construction, even should the beam fall the end near the wall is released without affecting the stability of the wall. Post caps are made of cast iron, malleable iron and steel. All these materials have given entire satisfaction, when used as they should be, although the present tendency is towards steel post caps for heavy duty in buildings designed for carrying floor loads.



Tile and Stucco Church

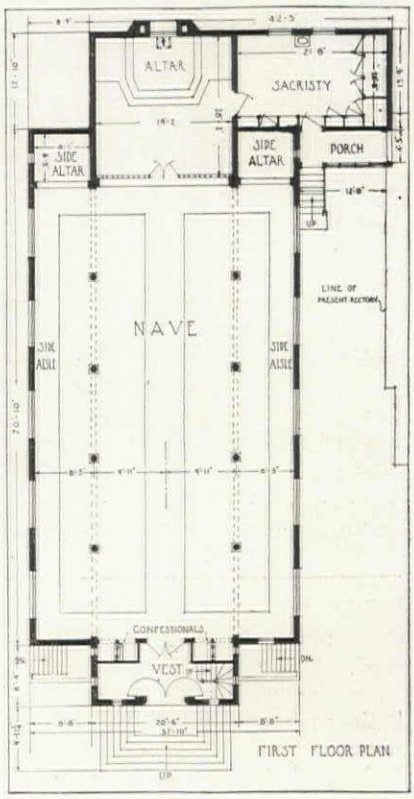
St. Catherine's Church at Riverside, Conn., seats 350



THE church illustrated here is of particular interest in showing that it is unnecessary to have a building with a great deal of expensive woodwork and an elaborate interior in order to convey the proper church feeling. Here is a building that is planned on most simple lines with three aisles, the main mass rising above the side aisles after the usual manner of Gothic buildings and enabling the interior to be well lighted by windows high up in the clerestory walls.

The foundation walls to grade are of concrete 1 1/2 ft. thick, and from grade to the underside of the first floor beams of 12-in. hollow tile and above the first floor of 8-in. hollow tile. The exterior is coated with stucco and the interior walls with sand finished plaster. The lintels over the windows in the basement and also in the aisle walls are con-

The plans of this church are most simple, permitting economical construction. The basement shows a large social hall with stage



crete beams reinforced with 4 1/2-in. rods. The actual roof timbers, which have been smooth dressed, show on the interior and a matched and beaded ceiling has been laid on their upper side which gives an all-wood timber ceiling at a minimum expense.

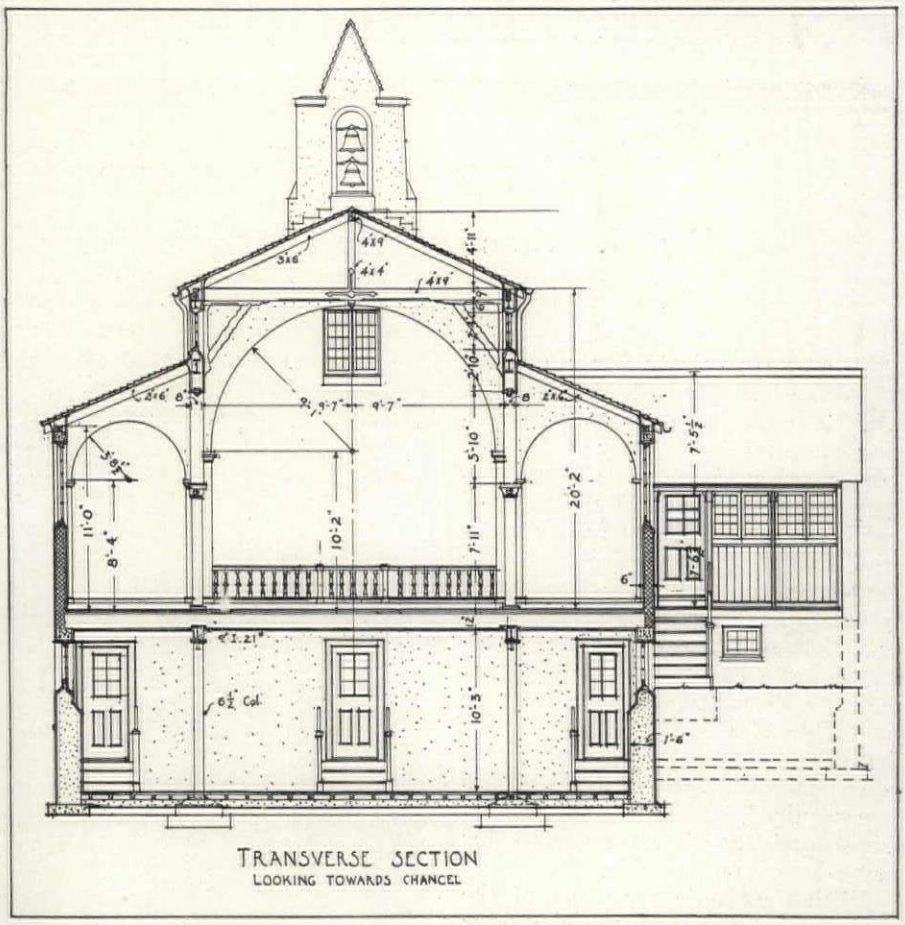
The roof is supported by simple timber trusses that occur in line with each set of columns. The common rafters are 2 x 6 and the truss rafters 3 x 6, and the truss is in addition made up of a 4 x 4 king post and 4 x 9 truss beam with ornamental wrought iron straps at the joints. The aisle rafters are 2 x 6 and similarly exposed on the inside with matched ceiling above them to correspond with the main roof. The outside roof is of 16-in. shingles.

The main support of both nave and aisle roofs is given by iron columns that extend from the concrete footings to the under side of the main roof plate at the level of the truss beams. The columns are broken only by the girders that support the main floor; 9-in. I beams form the floor girders and rest on the column caps, and the columns supporting the roof are attached to the upper flanges of the I beams with suitable plates. The ends of the roof rafters of the aisles are supported at the junction with the clerestory wall by a 9-in. I beam cut in between the columns and attached to the columns by means of angle irons.

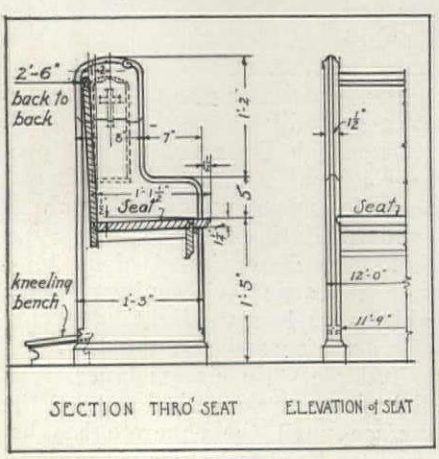
The clerestory wall between columns is arched and of frame construction, furred out with metal lath to 10-in. thickness and all surfaces covered with sand finished plaster. The chancel arch forming the end wall of the church is, however, of tile. The finished columns in the church proper are of imitation marble built around the structural iron.

The seating is arranged in two rows served by a central aisle and two wall aisles, and the pews are of special construction following a simple detail as indicated here. The basement is used for Sunday school and social purposes of different sorts, and is lighted with windows that are placed above grade. The under basement floor is of cinder concrete, waterproofed, and on this 2 x 4 sleepers are laid flat-wise with a double floor laid diagonally.

Cross section through church showing construction of walls, floors and roof framing



Interior walls are sand finished plaster. Roof timbers are smooth dressed and stained to form an open wood ceiling The pews are of special design as shown below



CONCRETE

Form Work-Reinforcing Methods Monolithic and Block Construction

Concrete Surface Finishes

Part I. Some simple methods of exterior wall treatment

By A. J. R. Curtis

IN a comparatively few years concrete has attained unquestioned leadership as a structural building material, and today it is used almost everywhere in the heavy supporting portions of buildings of various types. As a surfacing material, however, its possibilities have not been so well understood, and progress has been delayed by a feeling that somber, dead gray, blemished surfaces typify concrete, and have to be accepted where concrete is visible at all. Recent experience has shown that concrete has remarkable possibilities where fine surfaces are required, and that it often combines qualities of texture and color not otherwise obtainable.

With the single exception of the design of a structure, the character of the surface is the most important factor architecturally. No matter how good or poor the design, the appearance is improved by good surface treatment. No exposed concrete surface should go untreated, for there are possible, within range of allowable costs, a variety of attractive treatments adapted to almost every conceivable building need. It will only be possible in this and the following article to "hit the high spots" by describing a number of the commoner and more adaptable treatments.

Texture and color are the two varying qualities in surface finish, and they are to some extent interrelated. So, although for convenience the writer prefers to discuss texture first and then color, it is not possible or desirable to give entirely separate considerations to each of the two. The more important textures will be considered in three groups according to use: (1) exclusively for monolithic surfaces, (2) exclusively for concrete block and other pre-cast unit surfaces, and (3) for all monolithic and masonry surfaces. The subject of color will be considered in two divisions: (1) those secured by the use of colored aggregates, and (2) those secured by the use of mineral coloring pigments.

Fig. 1. Giving a surface finish to a concrete factory with grinding wheels made for the purpose

Texture Treatment for Monolithic Surfaces

Due to form irregularities, variation in consistency of the concrete mixtures, separation of particles, insufficient or improper spading and other conditions almost impossible to eliminate from field jobs, ordinary concrete surfaces as left by the forms usually present an unfinished and unsatisfactory appearance. Therefore, let it be agreed that for all uses where they will be exposed the surfaces of monolithic concrete should receive treatment.

For plain buildings, such as factories and warehouses and for other concrete work where an inexpensive, plain, smooth surface is desired, the most commonly used method is that of brush coating. As the forms are removed from each section of the work all fins and other undesirable projections are removed with a stiff wire brush, and all blemishes and hollows are filled with cement mortar applied with considerable pressure. The mortar should be made of a mixture of cement and fine aggregate used in the body of the work, otherwise the patches may vary in color from that of the body of the walls. Brushing and patching should take place while the work is still damp and as soft as possible.

Immediately following the brushing and patching the moist surface should be painted with a cement and water mixture of the consistency of cream. Calcimine or similar brushes are generally used. In a well planned job the painting will proceed only at such speed that it can be made continuous over the job; if impossible to do this, painting should be discontinued along lines such as corners or copings, which will conceal any slight streaking where work was interrupted.

Under certain circumstances it is difficult or uneconomical to treat the surface until the concrete has become too hard to be cleaned up with

a steel brush, and in such cases the walls may be rubbed with a concrete or carborundum brick until the desired smoothness is obtained, then moistened and painted as has just been described. Quite recently grinding wheels have been applied to this work with an obvious saving of labor expense and time and with greater regularity in the character of the work. A typical tool of this kind is shown in use in Fig. 1.

The grinding process may be continued to a depth which will penetrate the large and small aggregate in the mixture, giving a polished cross-section of the various stone used. If a pleasing collection of various colored and textured aggregates has been used in the surface concrete, effects fully equal to those in terrazzo floors may be obtained.

After the grinding is completed, the surfaces are honed with bricks or revolving discs of soft stone, which are used to work a pure cement mixture into little pin-hole pores. For best results the surfaces should then be buffed with a rotary power-driven felt buffer.

Fig. 2 gives an entrance detail and Fig. 3 a general view of the bush hammered surface of the Piqua Hosiery Company's concrete building. These views show the surfaces after exposure for five years in a city manufacturing district. The bush hammering was done with ordinary hand bush hammers, the same as those used in the preparation of natural stone. The smooth portions of the work were rubbed with a carborundum stone and filled with a creamy mixture of gray cement and water. No special aggregates were used. Fig. 3 illustrates a very good proportion between bush hammered and rubbed surfaces and also the adaptability of this method of surfacing for buildings of this character. The use of bush hammered surfaces is likely to be much more popular, due to the recent introduction of efficient air- and electrically-driven hammers, replacing slower and more expensive hand tools.

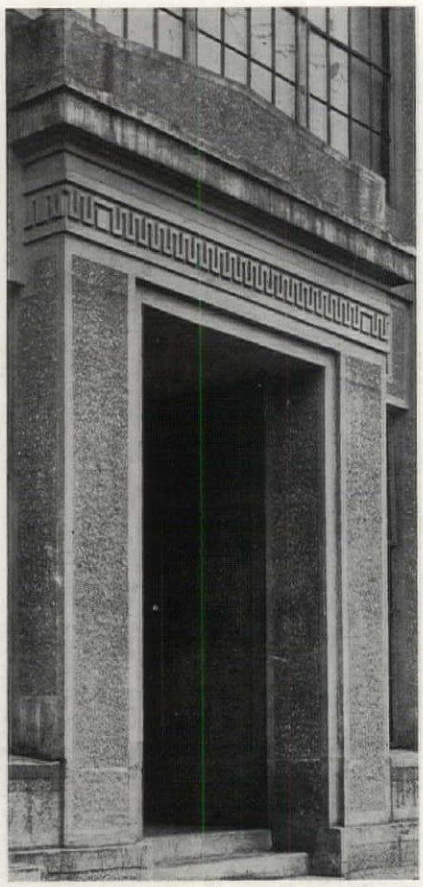
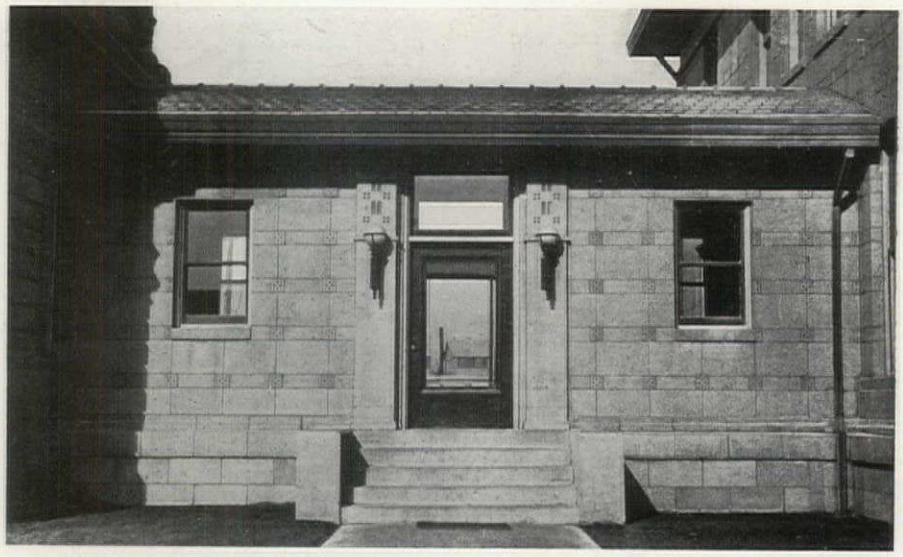


Fig. 2. Detail of entrance showing good effect of bush hammering, (the rougher surface) in contrast with smooth bands made by carborundum rubbing and filling of gray cement mixture. Fig. 3 below

The sand blast has been used to produce results somewhat resembling the finishes obtained by both the grinding and the bush hammering processes. The sand blasted surface is rougher than the former and smoother than the latter. It is best applied when the surfaces are quite hard, at least one month old, preferably using 1/8-in. or 1/4-in. nozzles, with sand properly screened for use through these nozzles. A nozzle pressure of at least 75 lbs. is required.

In order to avoid streaks, acid washing treatment of building surfaces should be carried on without interruption over each entire area. It must be borne in mind that while this treatment may be used in an experimental way to etch deeply



An interesting example of concrete block construction with rubbed concrete trim. Note pattern of joints and decorated blocks

into a surface, acid washing is only practical for use in removing surface film in the case of large areas such as the exterior of a building. Too much labor and acid would be required to extend the use of the process further.

A great variety of surface effects are possible by the use of common aggregates, often obtained locally, such as limestone, granite or other stone screenings, marble chips and different colored gravels and sands. On the removal of the forms the surface should be immediately brushed and patched to give a flat, even surface, and the acid treatment applied as soon as the concrete can be so treated without injury. Muriatic acid solutions, varying in strength from 1 to 10 to 1 to 4, are used, depending on the hardness of the concrete at the time of treatment, the character of the aggregates and the speed with which it is desired to etch the surface. The action of the acid must always be carefully observed and the surface thoroughly scrubbed with running water, or two or three changes of water, to entirely remove the acid, when it is desired to terminate the treatment.

Surfaces in a horizontal plane or inclined at angles up to approximately 45° may be finished with the float or trowel. The surface mortar should be floated on at a consistency only sufficiently wet to flow into the corners and recesses. For a very smooth surface, the sand used in the mortar should be well graded from fine to coarse, preferably having no particles larger than 1/8 in. in size. The proper level should be obtained with the straight edges or templates, the function of the float or trowel being only to obtain the desired surface texture.

Cast ornamental concrete is given a variety of surface finishes by use of pneumatic tooling machines. Below is a concrete barn with white cement wash surface

The use of the wooden float for finishing is recommended in preference to the steel trowel wherever the float will produce a sufficiently smooth surface. In all cases the steel trowel should be used as sparingly as possible, as it tends to bring the fine particles of cement and aggregate to the surface, greatly increasing the chances for checking or hair cracking. The wetter the consistency when troweling takes place, the more easily the small particles are pulled to the surface, and the danger of hair cracking is thereby greatly increased.

It is extremely important that all troweled surfaces be kept moist for at least 10 days, and at a moderate temperature for 48 hours after placing. Flat or cup shaped areas may be kept moist by flooding, taking great care not to injure the surface by admitting the water too soon. The surface is usually beyond danger of damage from water in 12 hours, in moderate temperatures.

Several leading manufacturers of paints and enamels have placed on the market mineral paints which may be successfully applied to rubbed or troweled surfaces. A very slight degree of porosity in the surface of the concrete is sufficient to cause ready absorption of paint. In the case of porous concrete, paint usually fills the surface pores in such a manner as to greatly increase the water tightness. For most surfaces the paint should be stippled on, in order to preserve surface texture and to avoid a possible dull appearance of painted stone. In ordering paint or enamel, be sure to obtain only products especially prepared for use on concrete.

SHOPWORK *and* FURNITURE

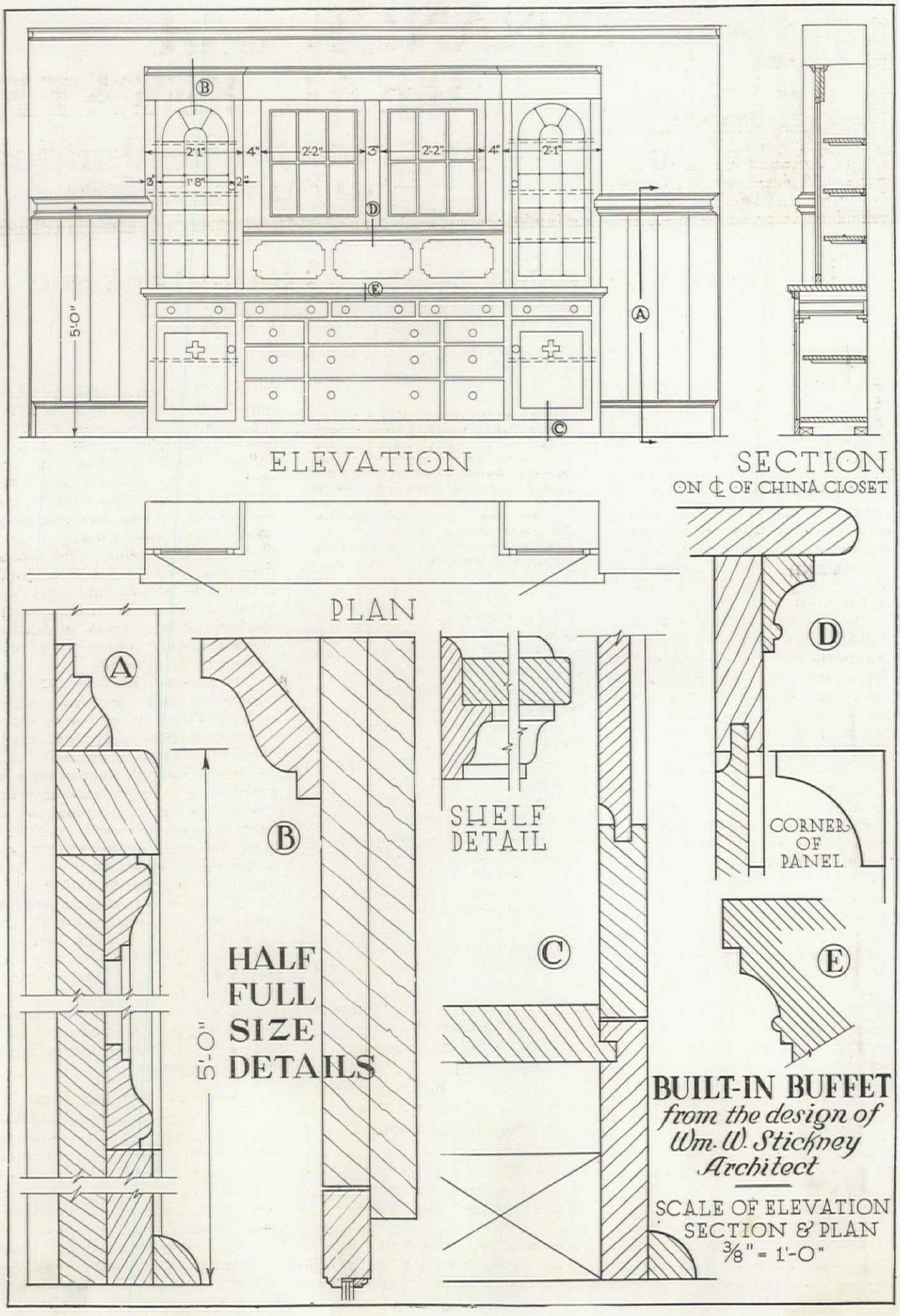
Designs for the Finish Man

A Dining Room Built-in Buffet

With special drawings from the design of William W. Stickney, Architect

A TENDENCY that is steadily growing in favor in house building is the use of built-in furniture which is found particularly valuable in houses that are built for sale. Such features as buffets in dining rooms, dressers in kitchens and linen cupboards on the second floors constitute a direct appeal to the prospective home buyer, and frequently are the points which bring about a final decision to buy.

The built-in buffet which is illustrated here is in a house in Pueblo, Col., which is shown elsewhere in this issue. It is a good example of a cabinet that is moderate in cost and at the same time has a good deal of style about it. The drawing on the following page gives a general elevation, together with the sections through the principal parts showing the few simple mouldings that have been used to carry out the design.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4"
2'1"
3"
1'8"
2"
D
E
A
C
5'-0"
ELEVATION
SECTION
ON ℄ OF CHINA CLOSET
PLAN
A
B
5'-0"
HALF
FULL
SIZE
DETAILS
SHELF
DETAIL
C
D
CORNER
OF
PANEL
E
BUILT-IN BUFFET
from the design of
Wm. W. Stickney
Architect
SCALE OF ELEVATION
SECTION & PLAN
3/8" = 1'-0"

FINANCE and REAL ESTATE

Helpful Data for the Builder Who Builds to Sell

The Business of Speculative Home Building

Part II. Proper Development of City Plots

By C. Stanley Taylor, Associate Editor

THIS is the second of a series of articles which will run through a number of issues giving a concise and detailed account of the many problems entering into speculative home building. The first of these articles covered the subject of suburban land development. The next article, which will appear in June, will be on financing speculative building operations.

LYING within the corporate limits of most cities and towns, there are parcels of land available for home building development. Some of these are in the form of single lots or groups of lots in built-up sections, while in the outlying districts there are usually available large blocks of land which may have been subdivided, but still represent low cost real estate available for the construction of moderate cost homes.

The problem of the speculative builder who proposes to operate within the city limits is entirely different from that of the builder in suburban districts. Within the city limits one usually encounters higher tax rates and higher realty values. There are also the questions of natural growth and development of the city, and the character of future conditions in each neighborhood.

In this issue we are describing the recent tax-exemption ordinance affecting property in New York, and judging by efforts to secure similar tax-exemption in other cities it is hoped that before long like measures may stimulate speculative building within city limits in many sections of the country. Meanwhile ordinances of this type do much to encourage speculative building, and already in New York there exists greatly increased interest in the subject.

In view of the fact that many cities have already adopted city plans, or may be considering them, it will be of interest to consider briefly the problem of zoning — its meaning and its effect on speculative home building.

The zoning of a city, which is an important integral part of city planning, means merely the laying out of restricted districts of the city, confining industrial activity to certain logical sections, and preventing the spreading of industrial and commercial development into existing good residential localities and into logical potential residence sections, thereby creating a condition familiar in many of our cities where good residential districts have been spoiled by the encroachment of business.

This question leads naturally to that of analyzing available land for speculative home building, and selecting the land in view of future probable conditions and future values. The exact future character of each residential section of the city, and of unbuilt sections may often be determined by careful analysis. The points which must be considered are:

1. Present and future transportation facilities.
2. The trend of city growth.
3. The trend of industrial and commercial building growth, if uncontrolled by zoning system.
4. Developments in analogous territory.

In giving more detailed consideration to the type of land available within the city limits, it is found that it falls, broadly, into three classifications. The first type consists chiefly of vacant lots in built-up sections where the character of the neighborhood is already determined. Here the problem of building class and type is simplified because it is largely controlled by conditions already existing, and the builder has but to study the success of various house types within the vicinity and improve somewhat upon those which have already demonstrated selling value. The second type of available land is to be found in the more sparsely built-up suburban sections, and the third type is in the form of large tracts in districts which are being opened up by new transportation systems.

The general problem which a speculative builder first faces is that of determining the section in which to operate. Obviously, local conditions will control the solution of this problem. Today the best sections in which to operate are those in which land values are low enough to develop houses which can be sold, with land, for prices up to $18,000, and particularly houses which will sell for in the neighborhood of $10,000. In all large cities transportation facilities are being gradually improved, and usually the plans of transportation expansion are well laid long before the actual construction of car lines. Naturally, any section which has recently been opened up, or where transportation has been greatly bettered, offers a logical field for building.

Costs and Dwelling Types

The problem, then, resolves itself into a consideration of the types and costs of dwellings to be constructed. While there are no definite rules that govern this situation, there are certain fundamental facts which a builder will do well to consider. In the first place, it is evident that the construction of a cheap house on expensive land, or of a dwelling on

land which is logically fitted for an apartment house, demonstrates poor business judgment. Again, it is not wise to build an expensive house in a section where land is cheap, as there will be cheap houses built in the vicinity ultimately, and the wise home buyer recognizes this fact.

The best rule with which we are acquainted in making such a determination may be called the 20% rule, in which the builder determines the selling value of his lot and builds thereon a structure which will sell at approximately five times the cost of the land, or, in other words, making the land value 20% of the building value. Thus we find that a lot worth $2,000 should have built upon it a structure worth $10,000, in this way keeping a sound balance between land and building valuations and not increasing logical maintenance costs for the future purchaser. This rule applied to any land within city limits will serve to approximate the cost of the building. If we may take, for example, a plot of land consisting of two lots 25 x 100 each, located in the Bronx section of New York, near the new Jerome avenue subway extension, we will find that such a plot can be purchased for about $6,000. Applying the 20% rule, the value of building or buildings constructed thereon should be approximately $30,000.

Now the question is: What types of building costing $30,000 could a speculative builder place on these lots? Evidently there can be a small apartment house built here at a higher cost, or two dwellings of the 2-family type costing from $15,000 to $18,000 each. Obviously, it would not be wise to build a $10,000 house on these lots, as this district is rapidly growing and is logically an apartment house center; nor is this a type of neighborhood where $15,000 individual dwellings on 25-ft. lots would be salable. The builder, therefore, realizes by this method of analysis that he has his choice between two 2- or 3-family houses and an apartment house. The apartment house in some ways would be more logical, because in a rapidly growing district, with adequate transportation facilities, the very building of an apartment house on this land in a neighborhood where many such buildings have already been constructed would aid in ultimately bringing the land value up to its necessary balanced valuation. Here the final determination should be made by considering local demand —whether it is for 3- or 4-room apartments or for larger apartments, as in a 2- or 3-family dwelling.

We may turn now to the Long Island City district of New York, which also has been rapidly opened up by adequate transportation facilities. Here we find blocks of land where the average value of a 20-ft. lot is $3,000, but where the character of the neighborhood calls for individual dwellings which can be sold, with land, for from $11,000 to $15,000.

To meet this situation, it has been found by certain experienced real estate developers that the best proposition was the construction of individual dwellings in rows, allowing from 18 to 22 ft. frontage for each house. An interesting type of row housing was therefore developed in which, by careful architectural design and the using of variegated colors and textures of materials, the usual monotonous row house was avoided and an individual touch was given to each dwelling.

Here also, with large tracts of land, the problem of laying out the land has involved interesting features. It was realized that with the row type of house, having a narrow frontage, it was unnecessary to have a lot 100 ft. deep to accommodate a house not over 40 ft. in depth. Therefore, many of the lots were made only 60 or 70 ft. in depth and a service street was run through with the rears of the houses on both adjoining streets facing this service street or court. In this manner delivery access to each house has been provided and, more important still, a driveway entrance for automobiles was afforded. Each house is equipped with a garage, which occupies part of the basement, being entered from this driveway and using a part of the house which usually has no value. In this case the builders were able to offer to the public attractive dwellings with individual garages within 20 or 25 minutes from the 42nd street section of New York at a price lower than is usually paid for a suburban dwelling with a garage.

The question is sometimes faced of dividing a tract of land within city limits to apportion to each dwelling a certain amount of land which local conditions may designate as logical to construction. Here again the 20% rule is of value; for instance, if one has in mind a block of land with 400-ft. frontage and 200 ft. in depth, and if the type of building which it seems logical to construct will average in cost $10,000 per house, it is evident that the value of land will determine the size of lot which may be allowed for each dwelling. It is evident by the 20% rule that $2.000 worth of land can be allowed per house. If this tract of land is worth $32,000, it is apparent that it must be divided into 16 dwelling sites. This is a good division, as it allows 16 lots of 50 x 100 each. On the other hand, if the tract of land is worth $16,000, it is evident that a lot 100 x 100 can be allowed for each house. In this manner the relative values of land and building will determine the amount of land allowable in each case.

Usually the layout of land within city limits, both as to street locations and as to lot sizes, is determined by a city plan or various local ordinances. If the layout is uncontrolled, on larger tracts of land the developer faces a problem as to whether he shall lay out the streets in "gridiron" fashion, or follow an irregular plan involving parking effects. Usually the street layouts must be approved by the city authorities, particularly in view of the fact that for new developments within city limits the streets are usually constructed and paving, grading, sewer and water mains put in by the city, which is repaid through assessments on all surrounding land. In years past, through the lack of city control of residential districts, unusual street layouts were common, and have resulted in some instances in much confusion and even litigation as the city grew, in more congested form, to surround the district in question.

It may be accepted as a general rule, that realty developments within city limits should be laid out with square corners and with lot and block sizes approximating the custom in that city. Of course, it must be realized that the contours of land have much to do with the laying out. If the land is rough and rolling it is often better and more economical to lay out streets following natural grades. On the other hand, if the land lies close to a developed section of the city, it is better to follow the street and block plans already developed, even though grades may interfere somewhat. This is a problem which is generally influenced by local municipal regulations, and which should be considered in view of the future rather than with reference to the immediate present.

The careful home buyer of today purchases his dwelling while considering several points important to him. He gives some thought to future land valuation, and if he sees that ultimately business will encroach into the district, he must be assured in his own mind that his lot is so planned and located that in

time to come it will fit naturally into the real estate scheme and will provide an increment sufficient for him to sell the house and lot at some future date at a land value which will repay his entire investment. If this condition is not evident, he wants to know that his home district will be protected against encroachment and in character for at least many years to come.

There are many lessons for a speculative builder to learn by studying what has already happened in his own city or his own district. Here he may see examples of unwisely planned home building speculation where the encroachment of industrial or business activity has killed the value of the property, or where invasion of the neighborhood by undesirable classes of people has had its indirect effect on the lowering of realty values or on cutting off all possibility of increase in land increment. As one of the greatest railroad engineers of this period recently said, 80% of engineering knowledge is plain common sense, so we may say that 80% of successful speculative home building is also plain common sense. There are certain fundamental and evident conditions which govern the trend of city expansion and the movement of classes of population. In almost every section there has been sufficient experimenting by speculative builders to offer object lessons to those who contemplate additional building. The living standards of the American public demand certain types of living accommodations in certain localities, and inversely demand that certain types of homes

Here are two pictures that point a moral. The one above shows row housing that is a good foundation for a slum. The public doesn't want such houses and when better ones are offered these will be vacant. Below is another group where some thought has been given to variety and making a pleasing street. They need cost no more than those above and they are a permanent asset

shall have an environment in keeping. These are fundamental laws, and should be considered as such by the speculative builder. If he transgresses the natural laws of land and building value ratio, environment, transportation facilities, industrial and commercial encroachment, and population trends, he must not be surprised if his venture is unsuccessful. On the other hand, if these conditions are made a part of his analysis he will make an investment which certainly will maintain its collateral value, and probably will return him a profit in proportion to the amount of common sense which he invests along with his money.

Tax Exemption Speeds Building

Definite results in New York point a way for other cities to stimulate small house building

A RECENT New York ordinance exempting from taxation, entirely or in part, all residential construction built during a period of two years, has already shown definite results in stimulating building activity. This is probably the most practical measure toward this end that has as yet been put into effect in the United States. It is evident, therefore, that this question of tax-exemption should be given serious consideration in every city and community where housing shortage exists.

Briefly, this ordinance, which is retroactive and covers a period from April, 1920 to April, 1922, exempts from real estate taxation for a period of ten years $5,000 of the appraised valuation on any individual dwelling, and $1,000 a room up to five rooms on each apartment of multi-family dwellings. In other words, on a dwelling with land that is appraised for taxation at $8,000, taxes are to be paid only on the balance of $3,000. The present New York tax rate being $2.85, it may be seen that this ordinance saves, per family housed, approximately $142.50 a year, or $1,425 in ten years. This is an actual saving which is negotiable from a real estate viewpoint. On a two-family house the saving would be twice as much, and similarly in buildings containing more apartments the saving would increase, in accordance with the terms of the ordinance.

While this ordinance has been in effect only a few weeks there are already in evidence a number of interesting results. It may be noted first that activity in the sale of improved realty has increased, a number of recently constructed apartment houses having already been sold under the new cost-saving conditions created by this ordinance. Brokers in outlying districts of the city, where land values are low, report a greatly increased interest in purchase of vacant property for building purposes. Naturally the effect of this exemption will be most beneficial to the inexpensive type of houses, where relative proportion of exemption to total appraised value is high. Thus on a dwelling in the high land value districts, where the lot might be appraised for $15,000 and the building for an equal amount, the exemption would represent only $5,000 on a $30,000 appraised value, or a tax-exemption of approximately 17%. In the outlying residential districts, where a $15,000 house might be built on a lot worth $3,000, the tax-exemption would be approximately 30%. Similarly, in the low cost district a house costing $7,000 might be erected on land worth $1,500 and the appraised valuation here, based on present appraisal methods, would probably be about $5,000, which would make this house exempt entirely from taxes for a period of ten years.

The result of this condition is already reflected in architects' offices, particularly in Brooklyn and other districts where land values are not high. Several speculative housing operations which have been held in abeyance are now proceeding.

Walter Stabler, Comptroller of the Metropolitan Life Insurance Company, at a recent meeting of the Board of Estimate of New York reported that since the passage of the tax-exemption ordinance this company had loaned over $2,000,000 to builders of five-story apartments of the walk-up type.

It is interesting to note that the definite effect of this ordinance is being felt exactly where the housing shortage is greatest, that is, in the districts available for the construction of moderate cost dwellings and apartment houses. Evidently in the outlying sections of other cities of the United States, and in small cities and towns where the housing shortage is acute, a tax-exemption measure of this type would go far toward encouraging home building.

Many of the savings banks and other loaning institutions, which have been approached for mortgage money, have been willing to loan, but restrict their appraisals to the pre-war building valuations. This is because they have been afraid of shrinkage in the replacement costs of buildings. This tax-exemption measure, which has the effect of actually reducing the cost of construction by amortizing $1,400 per family back to the purchaser over a period of ten years, naturally reduces this much of the potential shrinkage in value, and should influence the mortgage market toward a more liberal appraisal and toward the encouragement of building by increasing the local volume of money available for building and for permanent loans on structures for dwellings.

Builders, architects, real estate operators and others interested in stimulating local activity should, therefore, give serious consideration to this important action in New York, and realizing its results should make a definite effort to bring about some form of tax-exemption elsewhere. It is true that strong opposition has been brought to bear on this measure and that several arguments have been advanced, some being in the interests of property owners who are not in the exemption class—in other words, those who own buildings constructed before the tax-exemption period.

From the viewpoint of the municipality, there is nothing to lose and much to gain by limited tax-exemption of this type. Practically all dwellings constructed because of an inducement of this nature will pay taxes on the amount of appraisal in excess of the exemption, and there will also be an increment in the value of land in districts in which these houses are constructed which will reflect favorably on the income of the city because of an increase in taxable values. But more important than this is the fact that through this means the housing shortage may be somewhat relieved, and considerable sound activity developed in the building material and building labor markets.

It is a simple economic deduction that the best solution of any unstabilized condition in which high prices prevail is best strengthened by encouraging any local form of basic economic production. Thus an inducement in the form of tax-exemption, which may tend to greatly increase the activity of providing shelter, must be sound in principle and in fact.

Westmoreland, New York

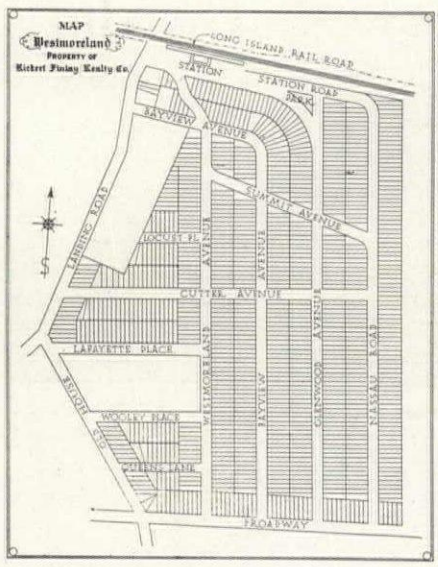
This new real estate development shows good architecture and layout expected by buyers to-day

Rickert-Brown Realty Co., Developers; Philip Resnyk, Architect

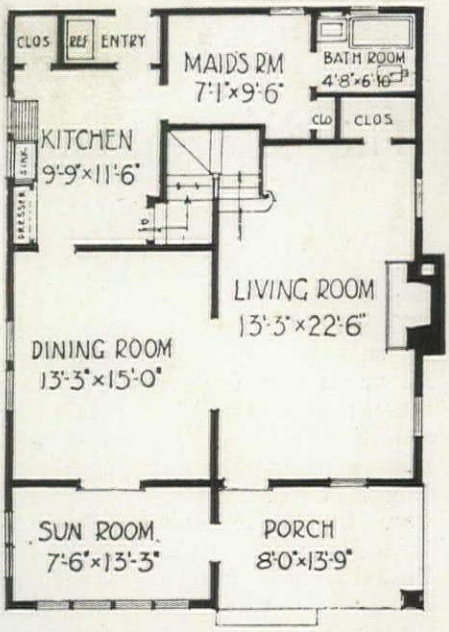
IT is quite possible to trace, in the suburban developments which are being carried out during these months of difficult building conditions, the application of certain lessons which many architects and builders learned during the war. Under the stimulus of conditions just prior to the entry of the United States into the war, and later during actual war conditions, there were developed numerous successful operations where group housing, carried out for various manufacturing concerns or for use at government-subsidized ship building yards or munitions works, proved the possibilities of group planning when the individual units are frame houses of what is generally described as moderate cost.

These results have not been lost upon the intelligent speculative builder. He now has a clearer understanding of what kind of houses the people want, and this has brought forcibly to his attention the high sales value of good architectural design. It might be said, of course, that in these times when habitations of literally any sort are in demand, the builder need experience but little difficulty in selling houses of almost any character which he may erect, but successful speculative builders are much too wise to impair the value of sections where they still own considerable vacant property by the construction of dwellings which would depreciate the value of their holdings. Such development, on the contrary, is expected to increase the value of vacant property and to stimulate a strong demand for more building, and this requires that the houses already built have permanent "sales value."

Westmoreland, on the north shore of Long Island, is an instance where modern speculative building of moderate cost may be studied to advan-



Well grown hedges and shrubbery give to Westmoreland an appearance wholly different from the average speculative development. Money spent thus is decidedly an asset

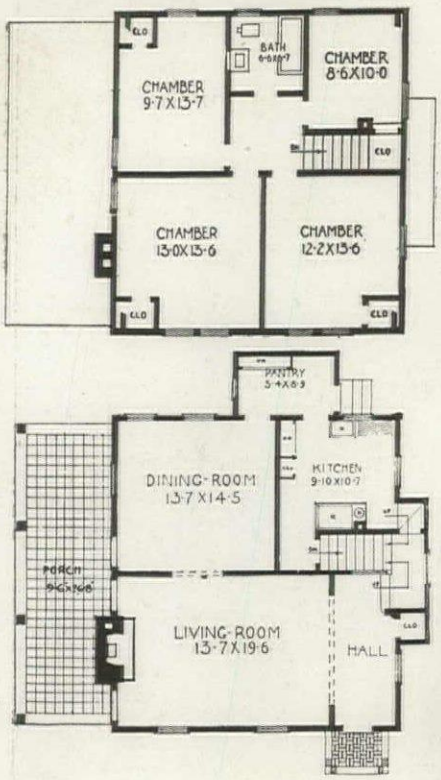


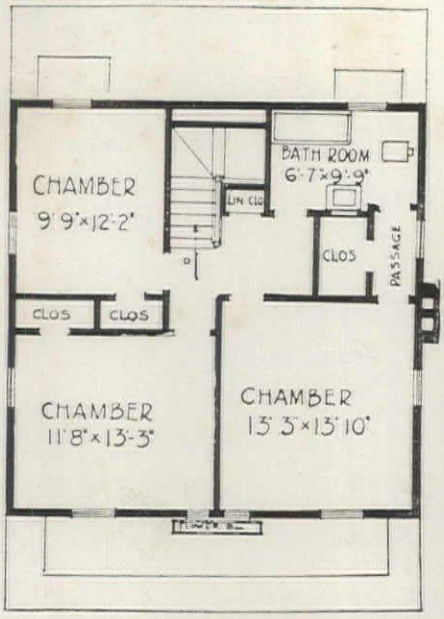
A small house of Dutch colonial type with attractive sun room. Plan of first floor above and second floor on opposite page

tage. The property, which is within a few minutes' walk of Little Neck station and but 26 minutes' travel from the Pennsylvania Station in New York by electric express trains, is situated close to the water and adjoins a district already well built up with houses of excellent character. The development of Westmoreland, therefore, called for improvements of a high order. Since the land is very nearly level, it was plotted several years ago with straight, 50-ft. roads rather than with the winding streets and lanes which are sometimes preferred where the irregularity of ground surfaces makes it desirable or where the individual plots are of considerable size. Here the lots are in most instances 20 x 100, but the character of the improvements suggests that at least three lots will be required for each residence.

The developers of this subdivision have also realized the desirability of offering the property to prospective purchasers with all the usual improvements made, a course which is always wise when marketing suburban property of good quality. Streets have been made, cement sidewalks laid and water supply and sewage systems fully installed. The character of the building in Westmoreland, already done or to be done later, is protected by restrictions such as have hitherto proved to be of benefit to suburban districts without being burdensome to individual home owners. The cost and character of buildings which may be erected are so restricted that no undesirable improvements can be con-

An especially attractive small house with glazed porch. Large dormers front and rear give full headroom in the second floor





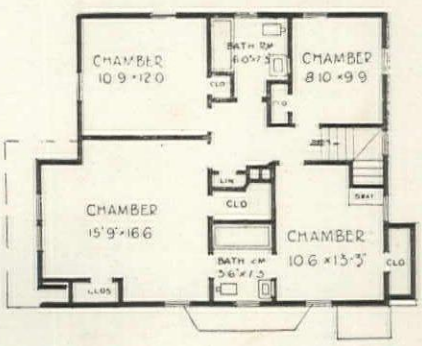
A variation of the house shown on the opposite page. Floor plans are the same except for rear porch instead of a maid's bathroom

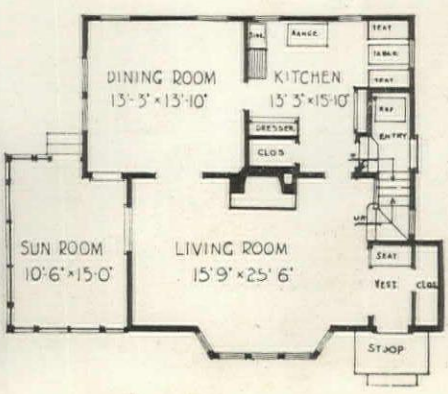
structed, and a permanent building line has been established on each street to which houses yet to be built must conform, so that no house will obstruct the street view of those near it. Fences, excepting those of hedge, are prohibited in front of the building lines. No stables or outbuildings of any kind may be erected except on the rear portions of lots. Business structures of any sort may be built only upon certain designated parts of the property. Lots in this restricted business section of Westmoreland, destined as it is to serve a residence area of considerable extent, already command high value.

The experienced developers of this property realize the value of adequate planting, and since the setting out of trees and hedges was done about 10 years ago houses in Westmoreland are not stranded upon an open plain, but from the beginning are possessed of an attractive and established setting which should add $1000 or more to the value of each house.

In planning the houses the architect has intended that the village shall possess a definite character, and that the houses shall be in architectural agreement without being so nearly alike that the effect is monotonous. The materials used are concrete for foundations, clapboards or shingles painted or stained white for walls, brick or concrete for chimneys and wooden shingles for roofs. Considerable attention has been given, in planning these distinctive exteriors, to avoid anything suggesting a "boxlike" appearance and, instead, to give to the houses a picturesque form which is helped by the use of such accessories as flower boxes and in some instances by the use of wooden shutters, painted green and having "cut outs" of

Still another variation of the white painted wood siding house. The large bay window is an attractive feature of the living room





An inexpensive type of small house designed on Dutch colonial lines. The porch is arranged to be glazed in winter and screened in summer

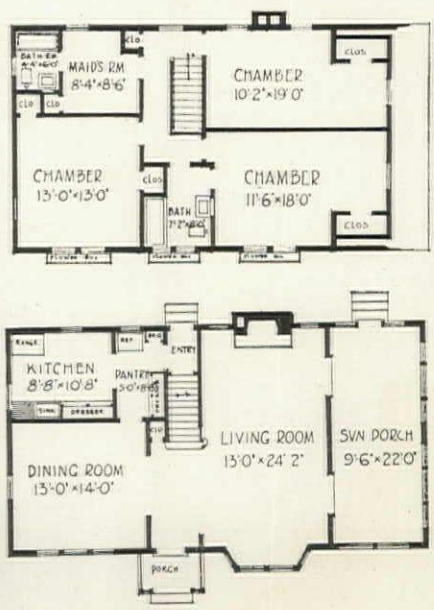
various interesting patterns. Almost every house includes a sun porch, which is placed where it will receive as much sunshine as possible, and since these sun porches open from living rooms or dining rooms, they become practically permanent parts of the lower floors and add materially to their size. Each living room has a fireplace. Most of these houses, also, have two baths and in some instances a maid's room with a bath is placed on the lower floor, adjoining the kitchen. In some of the smaller homes the kitchens include breakfast alcoves which simplify the housekeepers' work.

Much of the attractiveness of these houses is the result of using excellent qualities of finish and equipment. The houses are heated by steam, wired for electric lights and piped for gas in kitchen and laundries, and in most rooms the floors are of hardwood. In the bathrooms floors and wainscoting are of tile; trim throughout is white, and doors have been given a mahogany finish.

The developers of Westmoreland have already to their credit the successful marketing of considerable property in the form of subdivisions in various parts of the New York suburban district. Much of their success is the result of offering their property in a form so highly developed that there is nothing the lack of which the prospective investor could object to. The possible purchaser who may visit Westmoreland does not see a lonely stretch of open prairie, with streets vaguely indicated and a few straggling houses lost in surrounding space. What meets the view of an inquiring visitor is the neatest and most "shipshape" of suburban villages, where streets and sidewalks are fully installed, where all the necessary utilities are in place and where the district is already well built up with various sized houses of a highly distinctive and attractive order, each surrounded by its well-clipped hedge and green lawn, already well matured under the care of the company's landscape and nursery men.

The houses themselves fulfill every promise made to the possible investor by the appearance of the village itself; the windows are already provided with shades, and instead of hard, white plaster walls and ceilings the prospective purchaser finds the walls of upper and lower floors tastefully decorated with wall paper or else painted, and the ceilings in either case treated in a manner to be in keeping. Lighting fixtures are installed in the different rooms, and in each kitchen is placed a gas range complete with all the fittings which the most careful housekeeper could desire.

A house of larger size with long side toward the street. A dormer over the sun room gives two large bedrooms on the second floor



OFFICE and JOB MANAGEMENT

Things the other man has found out that save money

Methods in Quantity Estimating

Part XI. Details of Carpentry and Lumber Quantities

By Frederick H. Hunter, Quantity Surveyor

IN taking up the subject of carpentry we find several points that are different from what we have learned in connection with masonry. For example, in masonry the cost of the material and that of the labor to work and place it are roughly of the same amount. In carpentry, on the other hand, the cost of the material used in most branches of the work is considerably more than that of the labor required in connection with it. This makes it much more reasonable to estimate carpentry work on the basis of the amount of material to be bought than it would be to do the same thing when figuring masonry. The practice of working from the amount of material used is very common among carpenters but, except for framing lumber it is not, we think, the best method to follow. We shall take this point up later on.

In discussing masonry quantities, we have steadily maintained that the amount to be reported in each price item should be the actual quantity of brick or concrete that will be placed in the structure, and that any wastage should be allowed for in setting the unit prices to the several items. The excess costs of special features of the work, which occur to a greater or less extent on every job such as window jambs, and corners in brickwork, should, as we have advised, be averaged into the unit prices used for the main items. In carpentry, however, while the same general principle still holds, (that the quantity reported should not be increased to cover the extra labor costs of features usual to the work), the quantities of lumber reported will not be exactly those forming part of the work when it is completed.

The principal reason why the measurement of lumber differs in detail from that of masonry, is this:—that for brick or concrete, if one has not enough materials to build all of the walls, enough more stone or cement, brick or lime, can be procured and added, but a stick of framing lumber must be long enough for the place where it is to be used or it has absolutely no value for that particular place. This makes it essential that each piece of framing lumber be scheduled amply long for the use to which it is to be put. Where it is possible to ascertain from the plans to the last inch the length that a stick must be, (and it is possible to determine this when the plans are properly made), it might well be that a stick could not be obtained of this exact length. The usual lumber yard does not carry in stock framing lumber except in "even foot lengths," that is in pieces 12 ft., 14 ft., 16 ft., in length and so on. If a piece 12 ft. 4 ins. is essential, then the contractor has to figure that the piece he must buy will be 14 ft. unless the job is large enough to warrant his getting a shipment direct from a mill and provided there is time to wait for such a special shipment to arrive. Sometimes it is possible to get yard stock in intermediate lengths so that the contractor need only schedule to the "next whole foot"; usually, however, lumber from a yard will be sent and charged for to the "next even foot."

Ordering Direct from Mill

When ordering direct from a mill the contractor can generally get a schedule listed and charged for on the basis of the "next whole foot." This means that a piece ordered as 12 ft. 4 ins. is set down and charged for as 13 ft., while we have seen that from a local yard a piece of 14 ft. must be bought. In figuring the quantities of framing lumber for the houses in the working plan sections of THE BUILDERS' JOURNAL each month, the method of figuring to the "next whole foot" is always used, and it is what was suggested in the Boston report, to which we have repeatedly referred, as the basis for standard practice in scheduling timber for estimate purposes.

Combination Schedules Cut Lumber Waste

The difference in the quantities of lumber as figured out by these two systems is not as much as might, offhand, be supposed. If the lengths are various, about half of the pieces would measure to an odd number of feet and so many inches in length. For instance, pieces scaling 11 ft. 3 ins., 13 ft. 8 ins., 15 ft. 6 ins., etc., would go to the "next even foot" by either method of computing. This would mean that only 50% of the lumber would waste as much as a foot, or that the average waste would not be more than 6 or 8 ins. to the stick. If the average length of the pieces of joist needed is 14 ft., this would be an average of wastage of about 6%. For the short pieces of each size it is usually possible to work out some arrangement for cutting up longer sticks so as to get the short lengths with less waste than if a separate piece listed to the "next even foot" in length were scheduled for each location. For instance, pieces 6 ft. 4 ins., 4 ft. 6 ins. and 3 ft. could be cut with very little waste from a 14-ft. piece, while scheduled to the "next even foot" the three separate pieces would total 18 ft. long.

Occasionally a large schedule of lumber can be bought from a mill sawed to lengths of the "next half foot." When this is the case the wastage is cut down to the smallest possible extent. Scheduled thus to the "next half foot," the "next whole foot," or the "next even foot," depending on how the lumber is to be purchased, the quantity resulting is the proper amount for price items of framing lumber. This method of reporting framing lumber should be followed for everything heavier than 2 x 6, and for this size, or even 2 x 4 when used as floor joists, in very short spans or for rafters. Where 2 x 6s or 2 x 4s are used for stud partitions or wall framing, or for furring ceilings, they should not be listed in this way piece by piece, but by the area in square feet of each kind of construction as will be explained later on.

Separate Items in Schedule

In reporting a schedule of framing lumber it is usually best to keep and report each size of stock in a separate price item; of course, each kind of lumber, as spruce, yellow pine, etc., should be reported separately. It may be well enough to lump in a single price item odd lots of different sized timbers where neither the size nor length of any stick is much out of the ordinary, and where it would make the estimate long and tedious to report one or two pieces of several different sizes each in its own price item. Of course, the lumber used in different parts of a building should not be lumped in a single price item; for example, we would not lump 2 x 8 rafters and floor joists of the same size in the same price item. The lumber used in the roof framing of a pitched roof would carry a higher labor cost per M than the same sized pieces when used as floor joists. A 2 x 12 used as a stair stringer is, when sawed and placed, a far more costly piece of lumber than a floor joist of the same size in its place.

The cost of framing lumber depends on the sizes and lengths of the timbers required. In spruce, for example, any stick more than 8 ins. in width comes at a higher price per M than narrower pieces,—a 9-in. piece is slightly more, and a 10-in. piece more yet, and any piece over 20 ft. in length comes at a higher price than shorter sticks. The price increases rapidly with each additional 2 feet of length. The same principle holds for yellow pine, but the schedule changes for this come at different dimensions. Starting with 6-in. timber as the largest base size, 8-in. stuff is more expensive, 9-in. still more, and 10-in. and 12-in. each higher yet. In lengths, however, the excess prices for this stock do not begin till pieces are considered over 28 ft. in length.

This data is for the Boston market at the present time, but the same general principle will hold elsewhere and for other kinds of stock. Anyone listing up framing timber for estimate should get posted as to the exact dimensions where the price changes on each kind of stock are made in his particular locality. With this information in mind he will know what sizes it is proper to combine into any one price item.

One point which a novice has to learn before attempting to estimate carpentry is the unit measure for lumber. This is a "board foot," or, as it is often called, "a foot, board measure," or "ft., b. m." This unit means a 1-in. board (a board 1 in. thick), 12 ins. wide and 12 ins. long, or its equivalent. For instance, a piece of 2 x 6 or 3 x 4 contains 1 ft. board measure for each running foot of the stick. A piece 2 x 8 would, however, be 1 1/3 ft. board measure for each lineal foot—2 x 10, 1 2/3 ft. board measure, and a piece 2 x 12, 2 ft. board measure. But if a piece of lumber is planed or sawed less than 1 in. thick it is counted as a foot board measure for each square foot, just the same as though it were a full inch in thickness. For example, 100 ft., b. m. of 3/8-in. sheathing will cover no more area than 100 ft., b. m. of 7/8-in. sheathing, although the latter contains twice as much actual lumber.

Dressed Lumber Figured from Rough Stock

In the case of dressed lumber, matched boarding, etc., the board measure is figured out for the piece of square sawed stock from which the piece of finished sheathing or flooring is worked. A certain amount of wood has to be taken off in finishing each edge or face of a stick to insure getting down to a true surface for the entire length of the piece. The process of matching, therefore, reduces the effective width of the piece not only the 3/8 in. that is taken up by the tongue, but also a certain amount of wood on each side of the piece to get the edges true. This means that nearly 3/4 in. is taken off the piece in matching, and as at present lumber is sawed often a bit scant, a 3-in. piece must be figured (in getting at the board measure) to make a piece of flooring with a face showing 2 1/4 ins. in width. Thus for finished sheathing or flooring the percentage of the stock that is lost in matching is 15% to 25%. On ordinary matched boarding or matched planking, the loss is much less in proportion, for it wastes no more stock to match a board 8 ins. wide than it does for a board only 3 ins. wide.

Waste at Bearing Points

In addition to this very evident wastage in matching, which occurs at the mill, there is more or less wastage in cutting off the ends of boards so that the joints will come over a bearing. An average of 8 or 10 ins. is lost on each board where there are random lengths. Of course, where the nailings are definitely located, boarding may be secured of lengths that will work out more exactly; this economy is seldom worth while in ordinary frame construction where the floor joists are spaced from 12 to 16 ins. o. c. Each fitting and each corner mean that some board has been sawed off, and almost always the piece cut off is wasted. While no doubt, with sufficient attention, boarding and other lumber could be used up much more closely than is usually done, there is no real economy in trying to reduce the wastage below reasonable limits. In planning to get each piece of board used up exactly, enough time would be lost to pay for several feet of lumber. No one who has seen the large amount of waste lumber left after the construction of a house will fail to realize that considerable wasted stock has been paid for, and forms a part of the cost of the building, and yet does not actually form a part of the construction.

In running members such as sills, plates, girders, etc., it is usual to halve these together at the corners, and they have to be spliced from time to time between. In scheduling these members, length should be included for such splices. It is a good rule (except for truss timbers) to include a splice every 18 ft. as though standard lengths of stock were to be used. If, then, it is advisable to buy longer timbers, which cost more per foot than the standard length pieces, but which save the labor of making a splice, then the actual lumber saved by using the longer pieces and the labor saved because of splices omitted would go to offset,—in part at least,—the extra price paid for the longer sticks.

CONTRACTING EQUIPMENT

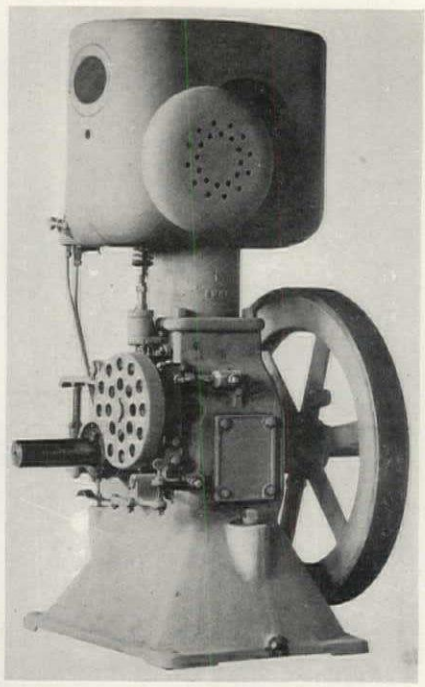
Reliable Information on Time and Labor Saving Devices

The Care and Use of Gasolene Engines

By H. H. Hodgkinson, Engineer

THERE is probably no piece of mechanical equipment which is regarded as such a complete mystery by the contractor as the gasolene engine. In fact these engines are often shunned and avoided, and other sources of power are used which are more costly and not nearly as flexible. It has been said that there is no good gasolene engine—that they are all bad, only some are worse than others. The variety of gasolene engines manufactured is great and there are a number of really good ones, which cost slightly more but are cheapest in the end.

Due to competition a great many gasolene engines are very cheaply constructed; they overheat, have no bushings to take up the wear and have poor means of lubrication, and they soon work themselves out of adjustment. They are built of a very low grade cast iron, very high in carbon and of coarse, crystalline structure which soon causes breakage, so the contractor is somewhat justified in his prejudice against gasolene engines. He should, however, not condemn them all because of the poor selection he has made, based usually on low price and clever sales talk. Good engines cost more to build because of their superior workmanship, better materials and design. Then, too, many pieces of equipment which are driven by gasolene engines demand more power than the engine is capable of delivering. Some manufacturers, to make the price attractive, sell 4-h. p. engines when 6-h. p. sizes are required, especially on one-bag concrete mixers. A gasolene engine, or any other engine for that matter, should not be worked up to or beyond its maximum capacity if it is expected to last any time and give real service. When a gasolene engine is overloaded the bearings heat up, wrist pins and connecting rods work loose. The engine overheats, carbon is deposited in the cylinders, and the cylinders themselves become scored, causing loss in compression, all of which results in loss of power, besides using far more gasolene than is necessary.



An improved type of 4 cylinder gasolene engine with plunger controlling the valves and positive control governor.

A good gasolene engine will give excellent service and work continuously, if given the proper care and attention, and will save the user considerable money as it is the cheapest source of power. Almost all manufacturers of gasolene engines have published instruction books which are sent out with each engine and they have done their part towards educating the user in the care and operation of gasolene engines. It is surprising how few of these books are read, and how seldom the instructions are followed. One gasolene engine manufacturer has aptly said "Read these instructions over carefully—it will be time well spent and money saved."

When a gasolene engine is installed it should be placed on a substantial foundation to avoid excessive vibration which will cause nuts to work loose and the engine soon to be thrown out of adjustment. The foundation bolts must be kept tight and should be provided with lock washers. The engine should be placed where there is light and be given room so that it is easily accessible. If the exhaust is objectionable, it can be readily piped outside the building, but a large size pipe should be used to avoid back pressure and will tend to function as a muffler. The engine should be kept clean and should be wiped off frequently, and kept away from dust and dirt which will be sucked into the cylinder along with the air and gasolene, causing unnecessary wear.

Most manufacturers of gasolene engines inspect and test them thoroughly, besides running them, to see that all parts are in proper adjustment and in perfect condition before they are shipped. The engine will run satisfactorily and at the proper speed provided none of the parts are changed from the way they are set when the engine is delivered. If the new engine is not running satisfactorily it is not necessary to call an expert for the trouble is probably in operating. The engine may be getting too much or not enough gasolene; that is, it is not getting the proper mixture. This is the most common mistake made in running a gasolene engine. Too much gasolene causes the cylinder to become flooded, which makes the engine hard to start. It is not advisable to flood the cylinder unless the engine is subjected to a low temperature, as the engine can be choked down by feeding too much gasolene quite as readily as by feed-

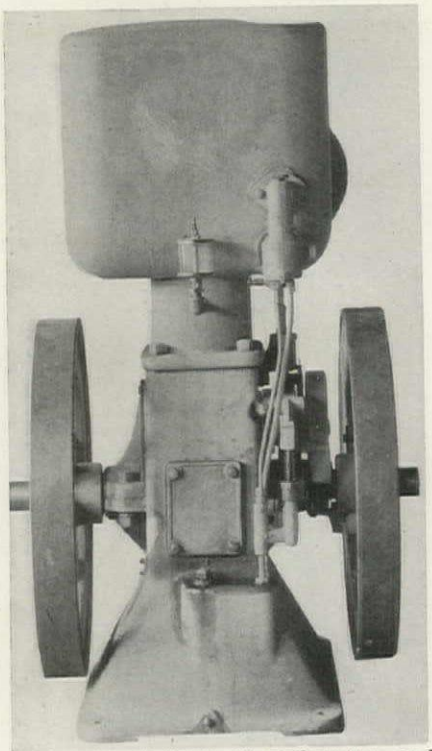
ing an insufficient quantity. If the gasolene is subjected to a low temperature the rate of evaporization is much lower and an extra amount of fuel is required. On the other hand, if the engine is given too little fuel there will be a popping and backfiring out of the air inlet and carburetor; however, the popping noise may also be caused by poor ignition, valves not seating properly or poor mixture. If the engine is horizontal, it is possible that the gasket of the cylinder head has blown out, which causes water to enter the cylinder, and requires a new gasket at once.

Careful Operation Necessary

Trouble may arise from the ignition, due to loose wires or incomplete wiring. The batteries of the engine, if so equipped, should be tested out and connections tightened and they should be in a clean, dry battery box away from heat. The points of the spark plug should be 1/32 in. apart. If the engine is equipped with a magneto, the bare wires must touch nothing but the binding post. Trouble not infrequently arises from water and dirt in the gasolene tank, which is located in the base of the engine. This can readily be found and the gasolene drained off and strained through a chamois.

Operators of gasolene engines are often led to believe that there is something wrong with an engine if the water in the hopper boils. The hotter the water gets the better the engine runs, because the gasolene vaporizes more readily, resulting in the use of less fuel. The cylinder is cooled by water circulating around it, and the heat passes off in the form of steam. It must be remembered that when gasolene is consumed in the cylinder a large part of the energy is transformed into heat which must be conducted away, so if the water in the hopper boils it should cause no alarm. By putting a little lubricating oil in the water it will not slop over. The water should be replaced as it evaporates and the hopper kept full, within 3 ins. of the top, and the parts kept well lubricated and there will be no danger of overheating.

A good grade of gasolene engine oil should be used for lubricating the engine. Steam cylinder oil should never be used. The cylinder oiler should be adjusted to feed from 6 to 12 drops per minute, depending on the size of the engine. The crank case should be kept filled to a point level with the drain cock provided in vertical engines, which allows the connecting rod to slightly touch the oil, which causes a splash and lubricates the main bearings. The cylinder oiler should always be turned off when the engine is idle. Too much cylinder oil causes a blue smoke, and should not be confused with the black smoke caused by too much gasolene. The oil in the crank case should be changed occasionally, as it loses its lubricating qualities, just as with an automobile engine. The outside bearings should be lubricated a couple of times a day and oil put on the timing gears and valve stems. It is important that the plunger of the gasolene pump be lubricated several times a day, in order to keep the packing tight so that the gasolene is fed properly to the carburetor. The gasolene has a tendency to dry up this packing so the pump sucks in air.



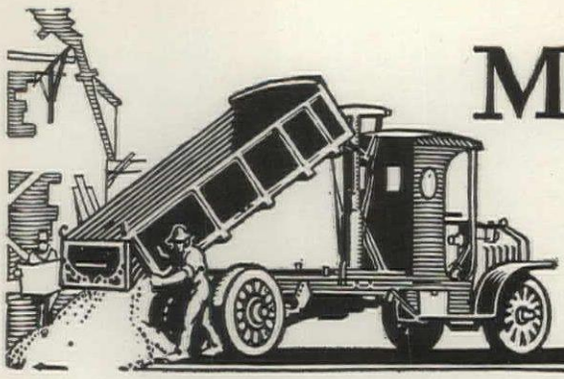
An improved type of carburetor and gasolene pump. It has large hopper and water circulates around the valves thoroughly. It is practically "fool proof."

Sometimes considerable trouble is experienced in starting the engine on cold mornings, and it can be easily remedied by filling the hopper with hot water and allowing it to heat up the engine before starting. If hot water is hard to obtain, a little flash of ether poured into the cylinder along with a little gasolene will start the engine immediately. The ether can be obtained at any drug store. The operator frequently makes a mistake in starting the engine by giving it too much gas, which floods the cylinder so that it will not start. If this occurs, the needle valve of the carburetor should be closed and the engine cranked a few times with the switch off to get the gas out of the cylinder. There is generally a mark on the needle valve of the carburetor at which it should be set when the engine is running. After the engine is heated up, some of the gasolene can be turned off. A gasolene engine can be started with little effort, after turning on the switch, opening the needle valve and closing the choke, by lifting up the intake valve and holding it open with one hand and spinning the engine with the crank. As there is no compression then, the intake valve can be released and the engine will start.

Getting Good Service

In closing, don't condemn the gasolene engine, but read the instruction book, study it carefully. Too many people think there is something the matter with the inside of an engine if it fails to run. It is generally some trivial thing before one's eyes that can readily be found with a little patience. A good grade of gas engine oil should be used in the cylinder oiler and the crank case. On a cold morning give the engine plenty of gasolene, but do not flood the cylinder, and have the choke closed. A new gasolene engine does not need to be adjusted, as it was tested just before it was shipped. It should be thoroughly oiled and the instructions carefully followed. Don't worry if the water boils in the hopper; more water should be added as it boils away. Most engine troubles are due to carburetor and ignition troubles, weak coils, batteries, loose wires, dirty spark plugs, dirt and water in the gasolene.

Remember that if there is a good mixture of air and gasolene, good compression and a good spark properly timed, the engine will run, but a lack of any one of these will cause trouble, and the trouble should be located rather than the engine condemned. Gasolene engines require just a little patience and study, and with the proper care will give service which will often be invaluable, but don't make the mistake of expecting even, efficient work from an engine which is often neglected and badly abused. The service obtained from a gasolene engine will be in exact proportion to the care and intelligence used in running it.



MOTOR TRUCKS

Efficient Methods in their Use and Upkeep

Buying a Truck

Hints for the contractor, which save money in the long run

By H. F. Blanchard, Associate Editor

IT does not pay to buy a cheap truck if it is to remain in the hands of the original owner until it is worn out; in that case buying the best truck is in the end the most satisfactory investment. On the other hand, if the need is but temporary it may be advisable to acquire a low priced machine rather than invest in one which costs more. If the builder prefers a good make of truck, but does not feel able to invest the money called for, he might buy a used truck of a good make, but if this is not deemed feasible he may have to consider the purchase of a new truck of a less desirable make.

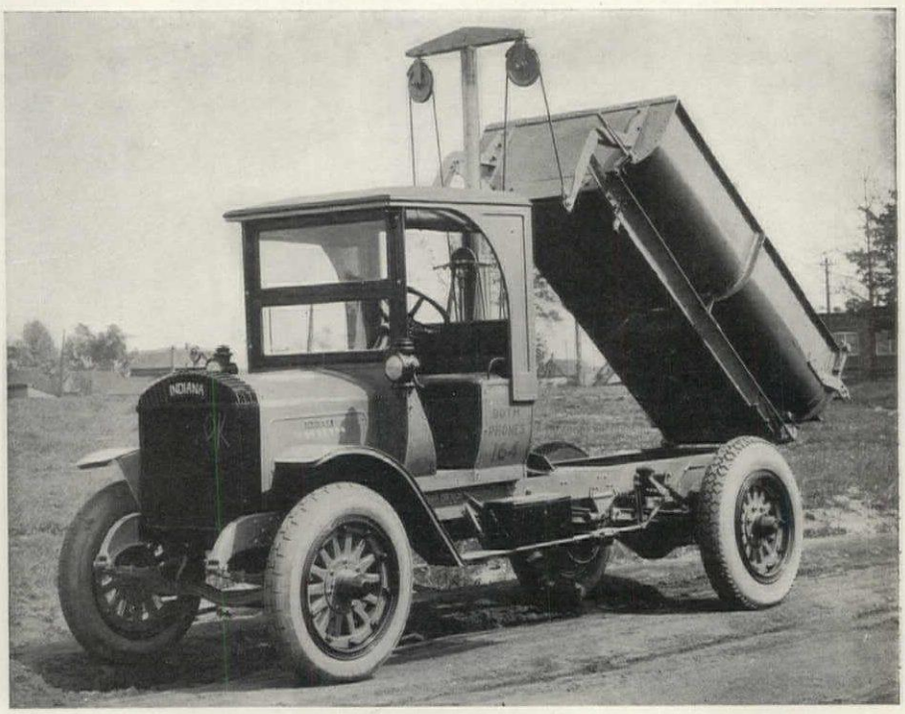
To get the best out of a cheap truck, special care must be taken to prevent its abuse. Because of the lack of mercy shown the average truck there is a well-defined feeling, among those who know, that the best truck is none too good because it suffers less under abuse and, unfortunately, it must be admitted that most trucks are badly abused. However, if it is necessary to operate a truck that is not the best, due regard should be had for the fact that it *is* of inferior make and not the best. It should not be overloaded nor overspeeded; rough spots on the road should be negotiated slowly, and in many other ways considerable care should be exercised to make sure that too much in the way of performance isn't expected.

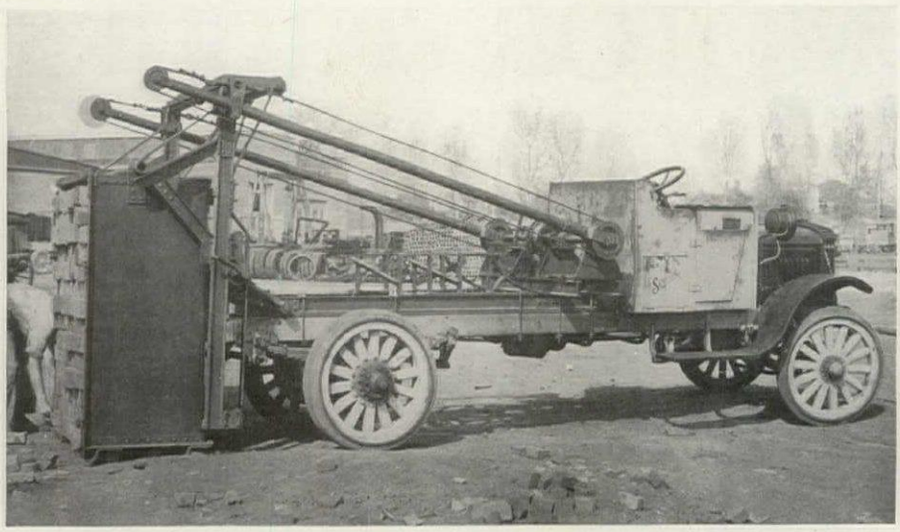
Until lately a 2-ton truck was a 2-ton truck the country over, but recently it has come to be recognized that this view is incorrect. A 2-ton truck may be easily the equivalent of a 3-ton truck in some places, and in other places it should be rated at only 1 or 1 1/2 tons. In other words, the smoother the roads the more the truck may be safely overloaded. This consideration is very important. The builder who is operating on good roads can safely haul much larger loads in his truck than he could if he were operating the same truck over rough roads. Conversely, the builder who is hauling over poor roads cannot haul so much; if he does so, he is straining the truck, and this abuse will soon show in breakdowns. This means, of course, that the builder who has good roads at his disposal does not need to spend as much for truck equipment.

If the country is hilly, a truck with a powerful motor is a much better investment. Speed and power vary, not only according to the individual view of what is best from the standpoint of each manufacturer, but also with the question of cost. A low priced truck is less likely to have a powerful motor than a high priced truck of the same capacity rating.

In hilly sections trucks with seven to ten-speed transmissions are coming into use. Such transmission provides just the right gear ratio for ascending the variety of hills apt to be encountered, at a maximum speed, and at the same time the top gears permit good speed on the level or on slightly down grades. As a specific example, two trucks operating in Cincinnati save 15 minutes per trip because they have ten-speed transmissions. Each truck makes eight trips per day, so that the total

Small dump truck with pneumatic tires—an attractive outfit where speed is essential





A special body equipment for unloading material in piles reducing breakage. Upper picture shows release of tail gate platform and lower pulling away from load

daily saving is just 2 hours. This is an important economy when it is considered that the advantage of the motor truck lies almost entirely in its superior speed. The faster it covers the ground the more work it does. These two trucks average 40 miles per day each.

Trucks of the same rated capacity often vary widely in price for two reasons: the difference in workmanship and material, and the amount of material. In the best trucks workmanship and material are not only the best obtainable, but all truck parts, such as the wheels, tires, frame, engine, etc., are amply large. In the cheap truck, on the contrary, workmanship and material are not so good and sizes of all parts are skimped. As a general rule, low price is attained to a greater degree by skimping the sizes of the component parts than by greatly slighting the workmanship or quality of material. There are many rather low priced trucks which have a good quality of material and workmanship, but the price reduction is obtained by reducing the sizes of the components. In other words, this means that such a truck may be called a 2-ton, whereas, according to the more conservative standards of the better makers, it would qualify as a 1-ton or perhaps a 1 1/2-ton machine. Obviously a truck which has such an exaggerated rating must suffer grievously from overloading in the hands of a careless user, and the man who buys such a truck is as likely to put 3 or 4 tons on it as he would be if he had a 2-ton truck rated according to more conservative standards.

There are few truck users who do not overload their trucks, some occasionally and others habitually. While this practice is naturally frowned upon by the manufacturers, it is fairly well established that the user saves money by overloading, at least up to a certain point. The overload shortens the life of the truck and increases repair bills, but the resultant cost is more than wiped out by the extra load carried. But the owner who overloads should not complain when he has truck troubles. If his truck goes to the repair shop oftener than he expected, very likely he can charge it to overloading. There is one owner of a 7-ton truck who hauls 14 tons regularly. This double truck capacity pays him, but he kicks because his tires do not run their guaranteed mileage, whereas he should be satisfied under such conditions if they run half their usual mileage.

If a contractor when buying a

A similar scheme on a Ford truck. It serves general purposes as well

truck knows that it will often be expected to carry a load much greater than its rated capacity, it would be economy of the wisest sort to invest in a truck strong and rugged enough to stand up under it.

How far will a good truck run before it is ready for the scrap heap? Figures recently issued by one of the leading truck makers show that 400 of his trucks have already run 300,000 miles or more; 5,200 have run from 200,000 to 300,000 miles; 10,700 have gone between 150,000 and 200,000 miles; and 17,000 have covered from 100,000 to 150,000 miles, and all these trucks are still in service. A truck, like any detail of machinery equipment, must be properly taken care of—not petted or pampered, necessarily, but given the care and attention which an intelligent owner would expect to give any important mechanical detail of his business, but which for some vague, unexplained reason he often seems to think is not required by the motor truck.

It is beyond the scope of this Department to attempt to give technical advice regarding the good and bad points of various trucks. No two manufacturers have the same point of view on truck design, and the selection of the truck is wholly up to the purchaser. However, it is worth while to remark that the builder, while he may find it necessary to buy a truck on reputation or to depend on the advice of a salesman, should use his own judgment in purchasing a truck body. He should carefully consider his own individual requirements and see to it that he gets a body that will suit his needs best. He should also consider the construction of the body critically. Some bodies are very well built, and others are very poorly built. Here is where his experience as a builder should serve him.

Certain forms of contracting require motor bodies of special patterns. Speed in loading and unloading brick is the feature of a new truck body of which several illustrations are given here. Instead of lifting the brick off a few at a time, as is now the custom, the whole load is deposited with a single movement, in a neat pile. When the body is loaded the bricks are piled as usual. When the truck loaded with bricks arrives at the job, the body is dumped by allowing it to slide off of the rear of the truck, so that when it comes in contact with the ground it is up on end. The tail gate of the body therefore becomes a platform, resting on the ground, on which the pile of brick stands. As soon as this tail gate platform is released, the body may be pulled back onto the truck and the pile of brick left standing there until ready for use. In order to save the time of the truck while the brick is being packed in loading, a number of these truck bodies may be employed.

In some cases, in purchasing a truck, it is necessary to select it with a view to the machinery along with which it is to be used. There was one contractor who found that the size of the trucks in his particular case was limited by the size of his cement mixer. It was necessary for him to use 1 1/2-ton trucks. On the other hand, if it had been possible to employ a larger mixer, 5-ton trucks might have been used to better advantage.

Cost of Operating a 2½-Ton Truck for One Month

Days in operation	25	
Miles traveled	1736	
Gals. of fuel used	248	
Gals. of oil used	11.5	
Average number of miles traveled daily	69.44	
Average number of miles per gal. of fuel	7.0	
Average number of miles per gal. of oil	151	
Fixed Expense:		
Interest on $3,430 at 6%	11.43	
Taxes	.41	
License	1.67	
Garage	10.00	
Insurance	8.33	
Driver's wages at $7.59 per day	189.95	Cents per mile
Total fixed expense	221.79	12.77
Variable Expense:		
Depreciation, based on $3,198.50 over estimated 60,000-mile life	92.53	5.33
Maintenance and repairs (estimated)	25.00	1.44
Tires, based on $231.50 over actual 15,000-mile life	26.73	1.54
Fuel, 248 gals. gasolene at 26.2 cts.	64.98	3.74
Oil, 11.5 gals. at 60 cts.	6.90	.40
Total variable expense	216.14	12.45
Total cost	437.93	25.22

Cost per day, 69.44 miles at 25.22 cts., is $17.51

The Ford outfit showing the way tail gate operates with dirt load

Current Notes and Comments

(*Continued from page 6*)

Easier Money Conditions Help Building in Warren, Ohio

MONEY, as far as building is concerned, is plentiful at the present time. Several loan companies have secured unlimited real estate capital for construction, which will be taken advantage of at once, because it was only through the inability to secure money to carry on the work that several worthy enterprises were recently stopped.

Industrial construction, halted on account of bad weather and the uncertainty of building supplies, has been resumed again and several large steel industries, including producers of smaller metal products, are putting in extensions. Two new allotments, each comprising 200 residences and one including a schoolhouse and park, will be started at once, which will aid in meeting the demand for houses.

A proposal to decrease building craftsmen's wages 20% was recently adopted by the employing contractors, but has not yet been put into effect. *(Edward A. Pfister, Warren, Ohio.)*

Material Dealers in Savannah Promote Building

CONSTRUCTION activity in Savannah is beginning to resume a more nearly normal level after a lull of several months. A number of residences are being erected, and a contract of more than usual proportions was let in March to a Savannah contractor, R. J. Whalley, by the Atlantic Coast Line for the construction of a locomotive round house involving more than $100,000.

The housing situation is still unsatisfactory and investment companies are planning the erection of a large number of cottages and bungalows to be sold on the installment plan. In addition to this, there is other evidence of business activity, and the prospect is that the summer will be a busy time for contractors. Figures recently compiled show that Savannah offers the greatest inducements, by comparison with prices in other cities, for prospective owners to build now, there being only one other city, in a comparison made with 25 others, that shows a lower scale in the matter of material and labor costs. These figures will be used as the basis for a series of "Build Now" advertisements to be run in the local newspapers jointly by building material dealers. *(J. H. Reese, Builders' Exchange, Savannah, Ga.)*

Youngstown, Ohio, Shows Steady Increase in Building

INTEREST in building and construction work in Youngstown has been aroused this spring as never before, and great activity is expected following the settlement of wage agreements May 1 which call for a reduction of 20%. Money conditions have improved and will still be better, for people are steadily saving.

The building outlook for Youngstown is indicated in the February report of Building Inspector O. F. Medicus, which shows an increase of nearly $200,000 in the value of new buildings over January, $100,000 over February of last year, and more than double the number of new structures authorized than during the corresponding month of 1920.

The housing shortage continues acute, and there is slight prospect of improvement until costs have been reduced. Prospective home buyers are not willing to invest their savings in houses under existing conditions, and money ordinarily available for financing such projects is unwilling to risk itself on the basis of present valuation with the prospect of decreased equities ahead. *(I. E. Sprankle, Youngstown Builders' Exchange.)*

Large Construction Work Announced in Baltimore

CONSTRUCTION work of large size is assured in the recent announcement of two undertakings. The principal operation will be the erection of the Baltimore branch of the Federal Reserve Bank of Richmond. The government has just completed a deal for the purchase of a number of properties and has announced its intention of starting building within the next month or two.

According to an announcement made lately, Klaw & Erlanger are planning the erection of a large theater in Baltimore, and it is also stated that the Boumi Temple, Mystic Shrine, proposes the erection of a large mosque adjoining the theater to cost in excess of a million dollars. Labor conditions in Baltimore continue to be stable and to be gradually improving insofar as employment is concerned. There is little, if any, labor trouble affecting the building trades. *(H. F. Audoun, Baltimore, Md.)*

Lower Wages and Materials Start Building Boom in Richmond

WITH the impetus of four years' growth in population, during which period there has been almost an absolute cessation of all building operations, Richmond this spring faces one of the greatest building seasons in its history. Everything is favorable to building activity, and scores of construction concerns are preparing to launch big ventures.

Realty men report that there has never been a greater demand for homes. Rental agents cannot accommodate the numerous concerns asking for office space in suitable buildings in the city. As far as can be learned, approximately $5,000,000 worth of building is under way at the present time or is seriously contemplated by builders of the city. There has been a great demand for moderate cost homes for purchase on the easy payment plan, and in consequence a home building corporation was recently formed for their construction.

The labor situation shows improvement; shops are opening up with full forces at lower scales after a lay-off of several months. The carpenters voluntarily reduced their wage scale from 80 to 72½ cents per hour. Plumbers have been reduced to 75 cents per hour as the maximum pay, bricklayers to 87½ cents per hour, and other trades in proportion. Most of the employers are operating under open shop conditions.

The city of Hopewell, Va., is developing a great silk industry. The Tubize Artificial Silk Company of America is now building a factory costing more than $4,000,000 in a section of the old Du Pont plant. Two thousand workmen are now completing the plant, which is the largest of the 14 industries recently located in the old Du Pont district. The first apartment hotel in Richmond is to be built at an estimated cost of $175,000. *(R. L. Shotwell, Builders' Exchange, Richmond, Va.)*

San Francisco Works Out Satisfactory Building Agreements

REASONABLE assurance of the progress of the building industry in San Francisco is given by a permanent arbitration agreement which has just been entered into by the San Francisco Building Trades Council, representing the workmen, and the Builders' Exchange, representing the employers. Both parties have bound themselves to submit to this board, which is non-partisan in character, all questions involving wages, hours and working conditions. The board is composed of three members, who represent impartially the interests of employer, employe and the general public. The hearings of the board are to be public, and the expense is to be borne equally by the employers and workmen. The accomplishment of this satisfactory settlement is due to the work of the San Francisco Chamber of Commerce.

New State Association of Master Builders in Massachusetts

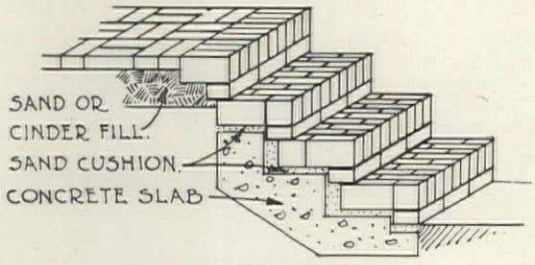
AS one of the results of the prolonged labor trouble in the building trades in Boston and vicinity, a State Association of Master Builders has recently been formed which will undoubtedly prove of value in standardizing conditions of employment and wages in various parts of the state, and in discouraging the tendency on the part of workmen to shift from one city to another during labor troubles, thereby prolonging disputes. A further plan of the movement is to establish and operate, at its own expense, a school for apprentices in every line of trade.

Pittsburgh Builders Co-operate to Reduce Prices

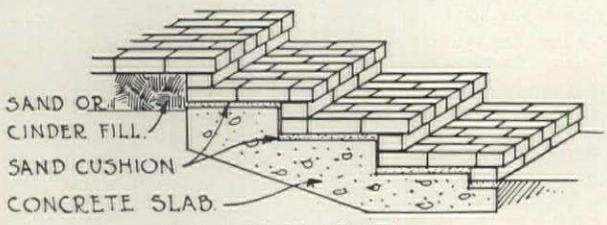
THE Building Construction Employers' Association of Pittsburgh has recently announced new rates of pay to cover a period beginning June 1 and ending February 28, 1922, the rate showing approximately a reduction of 20% from the wages now in effect and being slightly in advance of those which obtained a year ago.

An interesting feature of the campaign is that the Association has presented, in large advertising space in the newspapers, the new rates offered compared with those now received and those paid a year ago, and accompanying this table is a complete copy of the articles of agreement, which, in accord with the movement in other cities, calls for the elimination of union rules and regulations that have operated as a burden on the public.

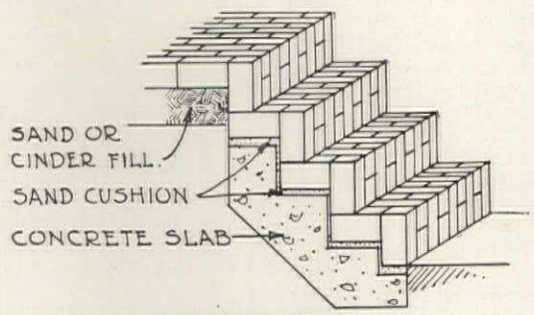
How to Build BRICK STEPS



Steps with Edge-Set Treads



Steps with Flat-Set Treads



Steps with End-Set Treads

Taken from the MANUAL of FACE BRICK CONSTRUCTION

FOR outside work, brick is a most permanent and beautiful material which never cracks, decays or requires periodic repairs such as other materials do.

Brick steps, except where supported by the foundation wall, as shown in working drawings, should always be laid over a concrete slab, reinforced, unless resting on solid, undisturbed soil. The concrete slab is poured in the form of steps, to correspond to the finished brick steps, but with proper allowance for laying the brick flat or on edge in a cushion of sand, at the option of owner.

The figures illustrate different pitches of steps and methods of setting the brick. Great care should be taken in the laying of brick steps if they have to withstand severe usage. The joints should all be filled with a rich cement mortar composed of one part cement to two parts sand.

The MANUAL Answers All Questions

Everyone interested in building work needs the MANUAL of FACE BRICK CONSTRUCTION. It explains and illustrates correct methods of handling every phase of face brick construction.

Types of walls, foundations, special uses of brick, brick bonds, mortar joints, fire protection facts and estimating tables are among the subjects discussed.

The book also shows thirty homes in full color, with floor arrangements. Full sets of plans for each of these homes are available at nominal prices.

Send one dollar for a Manual of Face Brick Construction. If you are not satisfied with the book, return it and we will refund your money. Address Dept. BJ5.

A·F·B·A
USE FACE BRICK
—*it Pays*

THE AMERICAN FACE BRICK ASSOCIATION

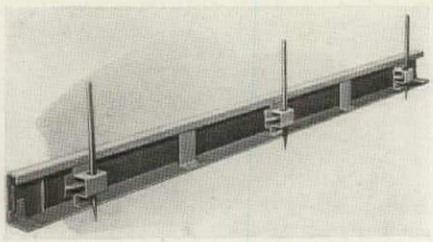
110 South Dearborn Street
CHICAGO

WHAT'S NEW

New Materials and Equipment that Keep Your Work Up to Date

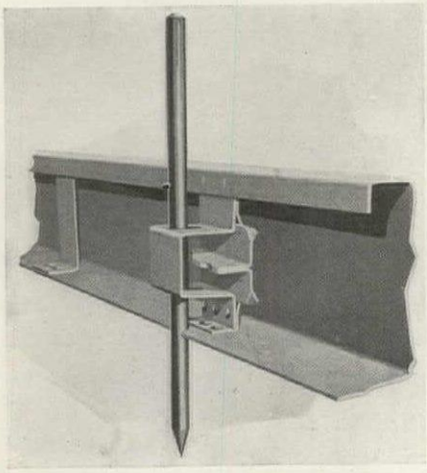
A New Steel Road Form

THE Lakewood Engineering Co., Cleveland, is supplying the Lakewood - Hotchkiss Road Form which will be found useful by contractors who construct roads, driveways, or such areas paved with concrete as are often placed before the entrances to garages. This is a blue annealed, high carbon steel road form, and is supplied in sec-



tions 10 ft. long and in the heights for road thickness, 5, 6, 7, 8, or 9 ins.

The distinguishing feature of the design is that a somewhat lighter metal has been used for the main section of the form, but this section has been reinforced by stiffening members, advantageously placed. Each 10-ft. section has the top flange



supported at five intermediate points by a heavy stiffening iron. This principle is the same as is used in bridge design, where light members are riveted together to form a strong truss, rather than using one solid heavy section of sufficient strength to carry the load.

The Lakewood-Hotchkiss Road Form has a bottom flange 4 ins. wide, giving a large bearing area on the ground. The top flange is 2 1/4 ins. wide, which is ample as a rail for the finishing or subgrade machines. The turndown section of the top is 1 3/4 ins. deep, making for unusual strength at this point. The forms are staked to the ground with three stakes to each 10-ft. section. The stake pockets have elliptical holes giving considerable leeway when driving the stake, so that it does not disturb the alignment of the forms.

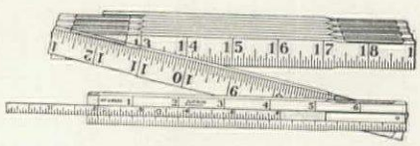
These forms are built so that any section may be removed from a line of forms set up to allow passage of trucks or other contractors' equipment. There is an extra heavy slide at the joint, which holds the forms in alignment, both laterally and vertically, and assures a smooth joint between the forms over which the finishing machines may run. These slides are extra heavy, and so located as to be accessible for driving with hand hammers when setting up or taking down the forms. It is to be noted that the top of this slide accurately fits into the channel-shaped head of the road form. There will be no opening of the forms at the joints, because of the careful working out of the details of this locking device.

There are no rivets in the top flange of the form to get worn and loose under the wheels of the finisher or subgrader. The sections of form are made from steel especially milled to size for each height of form. The rolled edges of the top and bottom flanges are so smooth that a man cannot cut his fingers while handling the form.

Improved Extension Rule

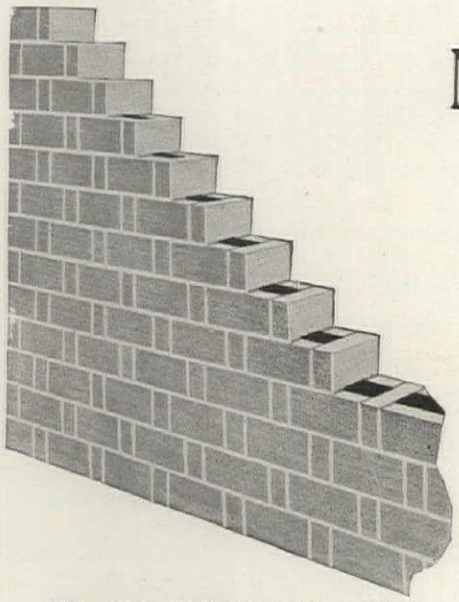
THE Lufkin Rule Co., Saginaw, Mich., already widely known as makers of rules of various kinds, have added to their line a new rule.

Made of genuine boxwood and known as the "Boxwood Extension Rule," it is particularly intended for taking inside measurements of openings, such as door and window frames, boilers, etc., and for meas-



urements which are generally difficult to secure, but this rule also serves any ordinary purpose quite as well as any other rule.

The first section of the rule is fitted with a graduated brass slide, which cannot come loose or fall out, as it is securely locked at both ends. To obtain inside measurements, open the rule to within 6 ins. or less of the distance between the points to be measured. Extend the brass slide by pushing the button to point of measurement. Add the measurement on the brass slide to that shown at the extreme end of rule, which will give you the exact distance between the points measured. Extension slide is admirably adapted to measuring depth of mortises and other holes. The rules are 6 ft. in length.



The "Ideal" Brick Hollow Wall

New Way to Lay Brick Cuts Cost One-Third

You can now build permanent, attractive, fire-safe brick homes at a cost no greater than for frame

Think What These Features Mean to You

The "Ideal" Wall uses any standard size Brick —face or common.

No special shapes are required.

Greater area of wall per day per bricklayer.

Produces any wall thickness desired with one or more air spaces.

No continuous mortar joint.

An absolutely dry, ventilated wall requiring no furring.

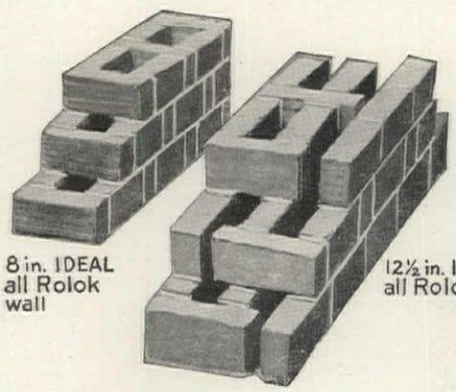
The strongest hollow wall ever built—2¼ inch. at its thinnest point.

Any pattern or bond desired.

Everlasting construction at the lowest cost ever known.

The "Ideal" All-Rolok Brick Hollow Wall is regarded as the greatest development of the century in building construction. It gives you strong, permanent, ventilated, fire-safe Brick construction at a cost no greater than Frame. It saves three to four Brick every square foot — saves labor; saves mortar. Its self-reinforcing qualities make it absolutely the strongest and simplest hollow wall construction, as well as the dryest and cheapest. It will save home owners millions and make money for you by enabling you to build and sell handsome Brick homes at a cost within the means of the average man.

The "Ideal" Brick Hollow Wall



8 in. IDEAL all Rolok wall

12½ in. IDEAL all Rolok wall.

Send today for Free Circular describing the "Ideal" Wall in all its various types.

THE COMMON BRICK INDUSTRY OF AMERICA

1312 Schofield Building Cleveland, Ohio

Selected List of Manufacturers' Literature

FOR THE SERVICE OF BUILDERS, CONTRACTORS, ARCHITECTS AND ENGINEERS

The publications listed in these columns are the most important of those issued by leading manufacturers identified with the building industry. They may be had without charge, unless otherwise noted, by applying on your business stationery to *The Builders' Journal*, 142 Berkeley St., Boston, Mass., or the manufacturer direct, in which case kindly mention this publication.

Listings in this Department are available to any manufacturer at the rate of $5 per listing per month.

BOILERS—See Heating Equipment

BRICK

American Face Brick Association, 1151 Westminster Bldg., Chicago, Ill.
The Story of Brick. Booklet. 7 x 9¼ in. 55 pp. Illustrated. Presents the merits of face brick from structural and artistic standpoints. Tables of comparative costs.
The Home of Beauty. Booklet. 8 x 10 in. 72 pp. Color plates. Presents fifty designs for small face brick houses submitted in national competition by architects. Text by Aymar Embury II, Architect. Price 50c.
A Manual of Face-Brick Construction. Booklet. 8½ x 11 in. Textbook on construction of the brick wall and various uses of face brick. 31 colored plates of brick houses with plans. Price, $1.00.

Bradford Brick Co., 2 Main Street, Bradford, Pa.
"Red" Catalog. 7⅝ x 5 in. 30 pp. Illustrated. Covers dry pressed and impervious smooth-faced brick.

Common Brick Manufacturers Association of America, 1309 Schofield Bldg., Cleveland, Ohio.
Brick for the Average Man's Home. Book. 8½ x 11 in. 72 pp. Color plates. Book of plans for bungalows, houses and apartments for which working drawings are available. Price $1.00.
Brick—How to Build and Estimate. Book. 8½ x 11 in. 48 pp. Illustrated. A manual for the brick builder on estimating and details of brick construction. Price 25c.

BUILDING STONE—See Stone, Building

BUSINESS EDUCATION

Alexander Hamilton Institute, Astor Place, New York, N. Y.
Forging Ahead in Business. Book. 5 x 7⅞ in. 116 pp. Illustrated. A detailed description of the plan and scope of the Modern Business Course and Service of the Alexander Hamilton Institute—a course in business training covering the fundamentals of all business.

CEMENT

Alpha Portland Cement Company, Easton, Pa.
Alpha Cement—How to Use It. Handbook 6 x 9 in. 96 pp. Illustrated. A practical handbook on popular forms of concrete construction, including form work, proper proportions in mixing, waterproofing, colored concrete, etc.
Alpha Service Sheets & Bulletins. Special suggestions on the construction of Industrial Housing, Garages, Inclosure Walls, Steps, Sidewalks, Barns, Silos, Farm Buildings, etc.
Alpha Aids. A bi-monthly magazine for those who buy, sell or use Portland Cement, sent complimentary to approved names.

Carney's Cement Company, Mankato, Minn. Booklet. 8 x 10 in. 20 pp. Illustrated. Complete information on product, showing prominent buildings in which this cement has been used.

Sandusky Cement Co., Dept. F, Cleveland, Ohio.
Medusa White Portland Cement, Stainless. Booklet. 8½ x 11 in. 48 pp. Illustrated.
Medusa Waterproof White Portland Cement. Booklet. 6 x 9 in 32 pp. Illustrated.
Medusa Review. 6 x 9 in. 18 pp. Illustrated. House organ issued bi-monthly.

CONDUIT

National Metal Molding Co., 1113 Fulton Building, Pittsburgh, Pa.
Bulletin of all National Metal Molding Products. In correspondence folder. 9½ x 11½ in.
Sherarduct. Circular. 5 x 8 in. Illustrated.
Flexsteel. Circular. 5 x 8 in. Illustrated.

CONSTRUCTION, FIREPROOF

Bostwick Steel Lath Co., The, Niles, Ohio.
After The Fire. Booklet. 6 x 9 in. 13 pp. Illustrated. Showing the fire-resistance of Bostwick "Truss-Loop."

National Fire Proofing Co., 250 Federal St., Pittsburgh, Pa.
Standard Fire Proofing Bulletin 171. 8½ x 11 in. 32 pp. Illustrated. A treatise on fire proof floor construction.

Northwestern Expanded Metal Co., 934 Old Colony Building, Chicago, Ill.
Fireproof Construction Catalog. 6 x 9 in. 72 pp. Illustrated. Handbook of practical suggestions for architects and contractors. Describing Nemco Expanded Metal Lath.
Fire-proof Construction. Handbook. 6 x 9 in. 72 pp. Illustrated. Describing Kno-Burn expanded metal lath.

DAMPPROOFING

Truscon Laboratories, The, Caniff Avenue and Grand Trunk R. R., Detroit, Mich.
Truscon Stonetex. Booklet. 5 x 8 in. 36 pp. Illustrated. A booklet telling of methods to decorate and make brick, stucco and masonry free from stains by the application of a cement coating.

DOORS, WINDOWS AND TRIM, METAL

Dahlstrom Metallic Door Company, 425 Buffalo Street, Jamestown, N. Y.
Architectural Catalog. 10 x 14 in. 46 pp. 11 sections. Illustrated. Catalog showing our regular styles and types of hollow metal doors and interior trim. Various types of frames and other architectural shapes also illustrated.
Architectural Portfolio. 14 x 18 in. 30 pp. Illustrated. Portfolio of various designs and types of Dahlstrom doors. Drawings and details of each style or type. This is only sent free to reliable architects.

DOORS, WINDOWS AND TRIM, METAL—Continued

Detroit Steel Products Co., 2005 East Grand Blvd., Detroit, Mich.
Fenestra Sidewall Sash. Catalog 8½ x 11 in. 24 pp. Illustrated. Details of construction, installation and layout of Fenestra Solid Steel Sash.
Fenestra Underwriters' Sash Catalog. 8½ x 11 in. 20 pp. Illustrated. Details of construction, installation and layout of sidewall and counterbalanced sash as labelled and inspected under the supervision of the Underwriters' Laboratories, Inc.

DUMBWAITERS

Kaestner & Hecht Co., Chicago, Ill.
Bulletin 520. Describes K. & H. Co. electric dumbwaiters. 8 pp.

Sedgwick Machine Works, 151 West 15th Street, New York.
Catalog and Service Sheets. Standard specifications, plans and prices for various types, etc. 4¼ x 8¼ in. 60 pp. Illustrated.

ELECTRICAL EQUIPMENT

Electric Boiler Corporation, Cambridge, Mass.
Electric Boilerette. Booklet. 5 x 7 in. 18 pp. Illustrated. Describing an electrically-heated and automatically-controlled water-boiler for homes, offices, barber-shops, etc. Made in sizes from five to one hundred gallons capacity.

Frink, I. P., Inc., 24th Street and 10th Avenue, New York, N. Y.
Catalog 415. 8½ x 11 in. 46 pp. Photographs and scaled cross sections. Specialized bank lighting, screen and partition reflectors, double and single desk reflectors and Polaralite Signs.

General Electric Co., Schenectady, N. Y.
G. E. Specialty Catalog. 3¼ x 4½ in. 210 pp. Illustrated. Pocket size descriptive booklet with cloth binding. Gives dimensions, catalog numbers, capacities, package weights, etc., of a complete line of essential wiring devices.
Novalux. Booklet. 8 x 10½ in. 36 pp. Illustrated. Ornamental street lighting units.
Standard Unit Switchboard Panels. Booklet. 8 x 10½ in. Illustrated. An index to types of standard unit panels for large and small plants, alternating current and direct current, giving references to descriptive bulletins on each type.

Harvey Hubbell, Inc., State and Bostwick Sts., Bridgeport, Conn.
For Milady's Convenience. Booklet. 5 x 7 in. 18 pp. Illustrated. Booklet illustrating the use of electric current outlets in the home.
Electric Wiring Devices. Catalog. 8 x 10½ in. 126 pp. Illustrated. Covering the complete line.

Habirshaw Electric Cable Company, Inc., Yonkers, N. Y.
Plans and Specifications for the Home Electrical. Catalog. 11 x 14 in. 20 pp. Rubber, oiled paper, varnished cambric insulated wires and cables for every condition of service.

Kohler Co., Kohler, Wis.
Kohler Automatic Power and Light 110 Volt D. C. Booklet. 5 x 7 in. 32 pp. Illustrated. Describes a standard voltage automatic, electric power and light plant for isolated homes.

Adam Electric Company, Frank, 3650 Windsor Pl., St. Louis, Mo.
The Answer to the Tenant Meter Problem. Booklet 6 x 9 in. 8 pp Illustrated. Describing the Frank Adam Meter Control Panel Boards and Cabinets which are designed especially for the increase or the decrease of the tenants' requirements in the building.
The Floor-Box With the Reversible Cover. Circular 3¼ x 6¼ in 8 pp. Illustrated.
Frank Adam Hanger Outlets. Circular 3½ x 6¼ in. Illustrated

Simplex Wire & Cable Co., 201 Devonshire Street, Boston, Mass.
Simplex Manual Catalog and reference book. 6¾ x 4¼ in 92 pp. Contains in addition to information regarding Simplex products, tables and data for the ready reference of architects, electrical engineers and contractors.

ELEVATORS

Kaestner & Hecht Co., Chicago, Ill.
Bulletin 500. Contains 32 pp. Giving genera information on passenger elevators for high buildings.

Otis Elevator Company, 11th Ave. & 26th Street, New York, N. Y.
Otis Push Button Controlled Elevators. Booklet. 6 x 9 in. 56 pp. Illustrated. Detailed description of Otis Push Button Elevators. Their uses in residences, stores, institutions, apartment houses, business offices and banks, etc.
Otis Gravity Spiral Conveyors. Booklet. 6 x 9 in. 56 pp. Illustrated. Gravity spiral conveyors for lowering packaged merchandise, boxed, cased and bundled goods in factories, warehouses, terminal buildings, etc.
Otis Electric Traction Elevators. Booklet. 9 x 12 in. 28 pp. Illustrated. Full details and illustrations of Otis geared and gearless traction elevators for all types of buildings.
Otis Escalators. Booklet. 6 x 9 in. 36 pp. Illustrated. Description of step and cleat type single and double file escalators (moving stairways).

Sedgwick Machine Works, 151 West 15th Street, New York.
Catalog and descriptive pamphlets. 4¼ x 8¼ in. 70 pp. Illustrated. Descriptive pamphlets on hand power freight elevators, sidewalk elevators, automobile elevators, etc.

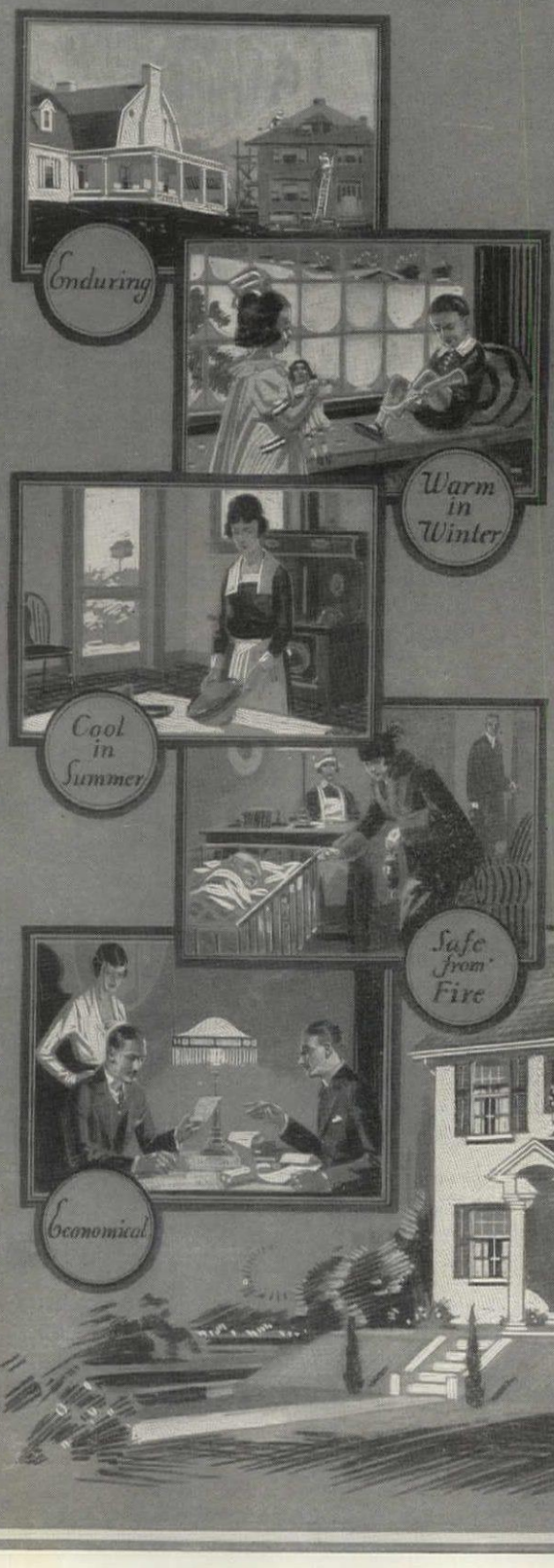
FENCES

American Fence Construction Co., 106 Church Street, New York.
Afco Factory Fences. Booklet. 9 x 12 in. 32 pp. Illustrated.
Residential Fences. Booklets. 7 x 2½ in. Illustrated. A series of booklets on residential fences consisting of photographs and brief descriptions.

Anchor Post Iron Works, 165 Broadway, New York, N. Y.
Catalog 51. 8½ x 11 in. 53 pp. Illustrated. Anchor Post Fences for Country Place, Factory or Farm.
Catalog 54. 8½ x 11 in. 24 pp. Illustrated. Factory Fences.

HOLLOW TILE

The Most Economical Form of Permanent Construction



THE savings in cost of construction and in maintenance charges made possible by the large units and the enduring quality of Hollow Tile should be pointed out to prospective builders. It is a strong appeal under present conditions and will increase building. Particularly so considering the comfort, the warmth in winter, the coolness in summer, and the dry, healthful home secured by the insulating air cells in the Hollow Tile.

To help builders stir up interest in home building we have created a PLAN SERVICE which embodies blue prints, specifications and bills of materials for homes and garages, and colored folders and newspaper electros describing these buildings. Plans may be secured through your local building material or lumber dealer at $10 for houses and $2 for garages.

Every builder should take advantage of this PLAN SERVICE and the opportunity it offers to increase his business.

Descriptive folders of homes and other PLAN SERVICE literature may be secured by writing to Dept. 185

THE HOLLOW BUILDING TILE ASSOCIATION

Representing America's Leading Manufacturers

CONWAY BUILDING, CHICAGO

MASTERTILE *The trade mark of the Hollow Building Tile Association and your assurance of a product made by an Associate member*

Colonial Home No. 1178
A dignified small home typical of the designs offered. Every requirement for comfort. Six rooms, sleeping porch, and open terraced porch. Order by design number

A Plan Service Which Means Greater Building Activity in Your Community

SELECTED LIST OF MANUFACTURERS' PUBLICATIONS — *Continued from page 54*

FIRE DOORS — See Doors, Windows and Trim, Metal

FIREPLACE EQUIPMENT

Covert Co., H. W., 137 E. 46th Street, New York, N. Y.
Hints on Fireplace Construction. Catalog. 5⅝ x 8½ in. 11 pp. Illustrated.
Diagrams of construction and installation of Covert "Improved" and "Old Style" Dampers and Smoke Chambers.

FLOORING

Armstrong Cork & Insulation Co., 132 24th Street, Pittsburgh, Pa.
Linotile Floors. Catalog. 6 x 9 in. 40 pp. Color plates. Describes Linotile, a composition of ground cork, wood flour, linseed oil and various gums and pigments in tile form.
The Ten-Point Cork Floor. Booklet. 3½ x 6 in. 16 pp. Shows design panels in color for Cork Tile floors.

Armstrong Cork Co. (Linoleum Dept.), Lancaster, Pa.
Armstong's Linoleum Floors. Catalog. 8½ x 11 in. 54 pp. Color plates. A technical treatise on linoleum, including tables and specifications for installing linoleum floors.
The Artistic Possibilities of Armstrong's Linoleum Floors. Booklet. 11¼ x 16½ in. 12 pp. Color plates
Armstrong's Linoleum Pattern Book, 1920. Catalog. 3½ x 6 in. 176 pp. Color plates. Reproductions in color of all patterns of linoleum and cork carpet in the Armstrong line.
Quality Sample Book. Three books. 3½ x 5¾ in. Showing all grades and thicknesses in the Armstrong line of linoleum and cork carpets.

Muller Co., Franklyn R., Waukegan, Ill.
Asbestone Composition Flooring. Circulars. 8½ x 11 in. Description and Specifications.

Oak Flooring Manufacturers Association, 1014 Ashland Block, Chicago, Ill.
Modern Oak Floors. Booklet. 6⅛ x 9¼ in. 24 pp. Illustrated. A general book that tells the complete story on Oak Flooring.
Oak Flooring, How and When to Use it. Booklet. 3½ x 6¼ in. 16 pp. Illustrated. A small, technical book showing the general rules, standard thickness and widths, how to lay, finish and care for oak floors.

FLOOR HARDENERS

Anti-Hydro Waterproofing Co., 299 Broadway, New York
Floor Hardening. Circular. 6½ x 8½ in. 4 pp. Describes an inexpensive method for producing permanently smooth, dustless and wearproof floors.

General Chemical Company, The, 25 Broad Street, New York, N. Y.
Hard-N-Tyte for concrete and mortars. Booklet. 3½ x 8½ in. 8 pp. Illustrated. Describes use of Hard-N-Tyte as application for hardening concrete floors.

Sonneborn Sons, Inc., L., 266 Pearl Street, New York.
Concrete and Lapidolith. Booklet. 5⅜ x 8⅛ in. 24 pp. Illustrated. Describing relation of Lapidolith chemical floor hardener to concrete construction.
Why Lapidolize? Booklet. 8½ x 11 in. 11 pp. Illustrated Reasons why Lapidolith should be specified.
Lapidolith Specifications. Circular. 8½ x 10¾ in 2 pp.

Truscon Laboratories, The, Cor. Caniff Avenue and Grand Trunk R. R., Detroit, Mich.
Agatex and Its Performances. Booklet. 8½ x 11 in. Describes the methods of hardening concrete floors by the application of a chemical which forms a new surface as hard as agate.

FURNACES—See Heating Equipment

FURNITURE

Leavens Co., Inc., The William, 32 Canal Street, Boston, Mass.
Catalog. 7 x 9 in. 200 loose leaved pp. Illustrated with wood cuts.

GARAGE CONSTRUCTION

Ramp Buildings Corporation, 50 Church Street, New York, N. Y.
The d'Humy Motoramp System of Building Design. Booklet. 8½ x 11 in. 20 pp. Illustrated. Describing the d'Humy system of ramp construction for garages, service buildings, factories, warehouses, etc., where it is desirable to drive automobiles and motor trucks or industrial tractors under their own power from floor to floor.

GLASS CONSTRUCTION

King Construction Company, N. Tonawanda, N. Y.
Catalog No. 52. 9 x 11 in. 45 pp. Illustrated. Illustrating and describing greenhouses erected for private estates and public parks.

Mississippi Wire Glass, 220 Fifth Avenue, New York.
Mississippi Wire Glass. Catalog. 3⅞ x 8½ in. 32 pp. Illustrated Covers the complete line.

GRANITE—See Stone, Building

HARDWARE

Cutler Mail Chute Company, Rochester, N. Y.
Cutler Mail Chute Model F. Booklet. 4 x 9¼ in. 8 pp. Illustrated.

McKinney Mfg. Co., Pittsburgh, Pa.
McKinney Cabinet Hardware. Catalog. 6 x 9 in. 32 pp. Illustrated. Describes complete line of hardware for cabinet and furniture work.
McKinney Hardware for Sliding Doors. Booklet. 6 x 9 in. 18 pp Illustrated. Describes different types of sliding door hardware.

Stanley Works, The, New Britain, Conn.
Wrought Hardware. Catalog. BJ10. 6½ x 10 in. Color plates. Shows all of the Stanley Works products made of steel from their own mills.
Eight Garages and their Stanley Garage Hardware. Booklet 5 x 6¾ in. 32 pp. Illustrated. Illustrations and floor plans of eight typical garages that have been correctly equipped with Stanley Garage Hardware.
Ball Bearing Butts. Booklet. BS. 5 x 7¼ in. 32 pp. Illustrated. Concise description of various butts manufactured.
Stanley Specially Designed Garage Hardware. Booklet. B-50. 6 x 9 in. 24 pp. Illustrated. Detailed pictures and descriptions of various garage hardware equipment.

Vonnegut Hardware Co., Indianapolis, Ind.
Von Duprin Self-Releasing Fire Exit Devices. Catalog. 12F 8 x 11 in. 41 pp. Illustrated.
"Saving Lives." Booklet. 3¼ x 6 in. 16 pp. Illustrated. A brief outline why Self-Releasing Fire Exit Devices should be used

HEATING EQUIPMENT

American Radiator Co., 816 South Michigan Avenue, Chicago, Ill.
Engineers' Data Book. 8 x 10¾ in. 48 pp. Illustrated. Valuable engineering data for estimating heating and ventilating requirements.
Ventilation for Vento Heaters. Catalog. 8 x 10¾ in. 24 pp. Illustrated. Examples of installation.

James B. Clow & Sons, 534 S. Franklin Street, Chicago, Ill.
Gasteam. Catalog. 6 x 9 in. 16 pp. Illustrated. New radiator using gas for fuel.

Gorton & Lidgerwood Co., 96 Liberty Street, New York.
Gorton Self-Feeding Boilers. Booklet. 4¼ x 7¼ in. 32 pp. Illustrated. Descriptions, specifications and prices.

Hess Warming & Ventilating Co., 1205D Tacoma Bldg., Chicago, Ill.
Modern Furnace Heating. Catalog. 6 x 9 in. 48 pp. Illustrated. Complete information on hot-air furnace heating useful to the architect and contractor regardless of what make of furnace he uses.

Kelly Controller Co., 175 W. Jackson Blvd., Chicago, Ill.
The Kelly Low Pressure Controller. Booklet. 4 x 9 in. 22 pp. Illustrated. Describing what The Kelly Controller accomplishes, its mechanical operation, and its application.

Kelsey Heating Company, James St., Syracuse, N.Y.
Booklet No. 5. 4 x 9 in. 32 pp. Illustrated. A dealers' booklet showing the Kelsey Warm Air Generator Method of warming and distributing air. Gives dimensions, heating capacities, weights, kind of coal recommended, and shows the mechanical and gravity system of heating homes, churches and schools.
Monroe Pipeless Booklet. 4½ x 8 in. 20 pp. Illustrated.
Monroe Tubular Heater. Booklet. 4½ x 8 in. 20 pp. Illustrated. General Booklet giving capacities, dimensions, weights, etc.
Syracuse Pipeless Booklet. 4½ x 8 in. 12 pp. Illustrated. General Booklet, giving sizes and capacities.

Kewanee Boiler Co., Kewanee, Ill.
Kewanee on the Job. Catalog. 8½ x 11 in. 80 pp. Illustrated. Showing installations of Kewanee boilers, water heaters, radiators, etc.
Catalog No. 73. 6 x 9 in. 35 pp. Illustrated. Describes Kewanee steel power boilers with complete specifications.
Catalog No. 74. 6 x 9 in. 35 pp. Illustrated. Describes Kewanee steel heating boilers with specifications.
Catalog No. 75. 8½ x 11 in. 6 pp. Illustrated. Specifications on Tabasco Water Heaters, Kewanee water heating garbage burners and Kewanee steel tanks.

Minneapolis Heat Regulator Company, Minneapolis, Minn.
The Heart of the Heating Plant. Catalog. 6 x 9 in. 20 pp. Illustrated. Describing the Minneapolis Heat Regulator, its construction, application and operation for the automatic control of temperature where coal, gas, fuel oil or street steam is used.

Page Boiler Company, The Wm. H., 141 West 36th Street, New York, N. Y.
Page Boilers. Catalog. 4½ x 8 in. 84 pp. Illustrated. Descriptions with specifications of the Volunteer Round and Monarch Square Sectional Boilers; also the Monarch Down-Draft Smokeless Boiler; with method for apportioning size of boiler and radiation, and other heating data.

Riverside Boiler Works, Cambridge, Mass.
Riverside Range Boilers and Tanks. Catalog. 6 x 3 in. 35 pp. Illustrated. Shows sizes regularly manufactured, methods of installation and descriptions of processes used in manufacturing.

Smith Co., H. B., 57 Main Street, Westfield, Mass.
General Boiler and Radiator Catalog. 4 x 7 in. 90 pp. Illustrated. Giving ratings, dimensions, capacities and working pressures.
Engineer's Data Ring Book. 4 x 7 in. 125 pp. Illustrated.
Architect's and Contractor's Binders. These binders are made up of 9½ x 11 in. folders of different kinds giving dimensions, price lists, and erecting directions on the different lines of our manufacture.

Utica Heater Co., Utica, N. Y.
Imperial Boilers & Heating Supplies. Catalog. 3½ x 6½ in. 52 pp. Illustrated.
Imperial Super Smokeless Boilers. Loose leaf catalog. 8½ x 11 in. 24 pp.
Superior Warm Air Furnaces. Catalog. 4½ x 8 in. 36 pp. Illustrated.
New Idea Pipeless Furnaces. Circular. 8½ x 11 in. 4 pp. Illustrated.

HEAT REGULATORS—See Heating Equipment

HOISTS

Gillis & Geoghegan, 544 West Broadway, New York.
Hoists for Industrial Plants. Booklet. 6 x 8¾ in. 8 pp. Illustrated. Labor saving service in the lifting or lowering of lighter loads, through the use of G. & G. Telescopic and Non-telescopic Hoists.
Removing Ashes. Booklet. 6 x 8¾ in. 6 pp. Illustrated. Removing ashes from boiler room directly to wagon by electrically operated Telescopic Hoists.

HOLLOW TILE—See Tile, Hollow

INSULATION

Bishopric Mfg. Company, 103 Este Avenue, Cincinnati, Ohio.
Homes Built on the Wisdom of Ages. Catalog. 6 x 9 in. 48 pp. Illustrated. Describing the use of Bishopric Stucco-Board and Bishopric Sheathing Board.

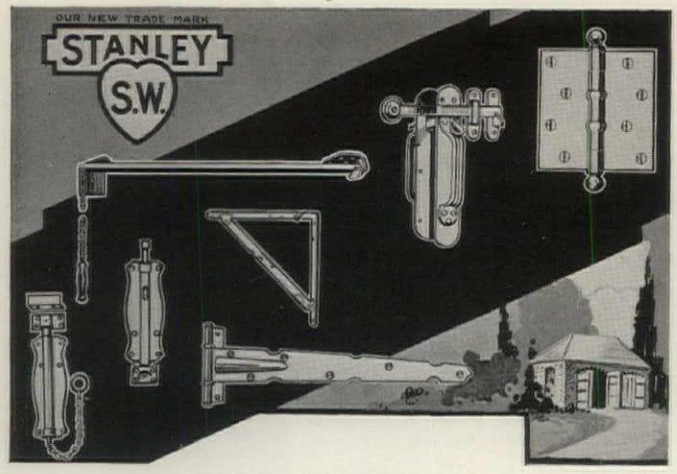
Philip Carey Co., The, Cincinnati, Ohio.
Carey Asbestos and Magnesia Products. Catalog. 6 x 9 in. 72 pp. Illustrated.

JOISTS AND STUDS, PRESSED STEEL

Truscon Steel Co., Youngstown, Ohio.
Truscon Standard Buildings, 4th ed. Catalog. 8½ x 11 in. 40 pp. Illustrated. Erection details, cross-section diagrams and adaptations are given.
Truscon Structural Pressed Steel. Catalog. 8½ x 11 in. 24 pp. Illustrated. Information on Pressed Steel Beams and Joists for light occupancy buildings. Tables, specifications and views of installations.

LATH, METAL AND REINFORCING

The Bostwick Steel Lath Co., Niles, Ohio.
Bostwick Steel Lath, Revised Edition 1920. Catalog. 9 x 11½ in. 28 pp. Illustrated. Covers the entire line. Drawings and Specifications.

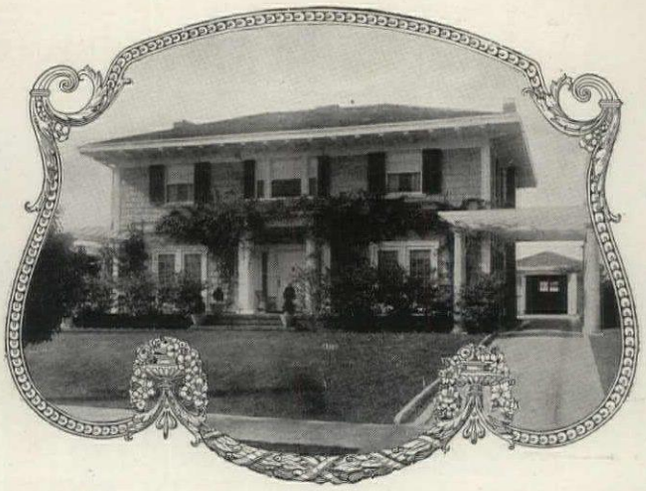


STANLEY
WROUGHT STEEL
HARDWARE

Keeps Buildings "Young"

Age first attacks the doors and windows of a building, these being subjected to the greatest wear and tear. Buildings equipped with Stanley Wrought Steel Hardware—Ball Bearing Butts, Bolts, Hinges, Hasps, Door Holders, etc.—remain "young" indefinitely.

Send for catalogs BJ5 of the various lines of Stanley Wrought Steel Hardware, including Screen and Garage Hardware.



What's under the Paint?

The permanent beauty of any wooden house depends primarily on the lumber used. If it is hard in some spots and soft and spongy in others, if it has streaks of sapwood or "bleeds" pitch here and there, it is almost impossible to give it a painted surface that will look well—and stay looking well. In a short time it gets "spotty." Where it gets "spotty" there is shrinking, swelling and warping. Decay begins.

In a few years repairs become necessary. The value of the house shrinks as the soundness of its sidings, porch posts and columns, railings, gutters, window frames, eaves, roof, water tables and other parts, constantly exposed to climatic changes and moisture gradually deteriorate.

Rot and decay start under porch columns, porch posts and flooring, exterior siding, eaves, gutters, door and window frames, rails, roof or side shingles, mud sills —wherever there is exposure to earth, air or water. Use Redwood.

Architects and builders fully appreciate the necessity for a careful selection of kinds and grades of wood to be used. No wood meets all requirements for all purposes. Hard wood is best for some uses, soft wood for others. For exteriors, paint-holding qualities and resistance to rot are extremely important.

Redwood possesses both these qualities to a remarkable degree. Every fibre is impregnated with a preservative which guards it against rot and decay. It has a uniform cellular structure which provides paint-tenacious surfaces. It is free from pitch and other resinous substances. Redwood is also remarkably free from knots, splits, sapwood, worm holes and other blemishes. It is straight grained and of uniform texture.

Properly dried, Redwood shrinks, swells and warps less than any wood you can specify. It will resist the action of the elements longer—painted, stained or unfinished—than any other wood.

Technical Data on Redwood

The three Redwood Information Sheets listed below should be in every architect's files. They will be supplied gladly by our Chicago office. Write for them today.

"Residential Building Materials"
"Industrial Building Materials"
"Farm and Dairy Buildings and Equipment"

The Pacific Lumber Co. OF ILLINOIS
REDWOOD
REG. U.S. PAT. OFF.

2071 McCORMICK BUILDING, CHICAGO

New York THE PACIFIC LUMBER CO. Kansas City
San Francisco Los Angeles

The largest Manufacturers and Distributors of California Redwood

SELECTED LIST OF MANUFACTURERS' PUBLICATIONS — *Continued from page 56*

LATH, METAL AND REINFORCING — Continued

Corrugated Bar Company, Inc., Buffalo, N. Y.
Corr-Mesh. Catalog. 6 x 9 in. Illustrated. Describes the characteristics of Corr-Mesh, a ribbed expanded metal used in concrete and stucco construction.
Corr-Plate. Catalog. 6 x 9 in. 63 pp. Illustrated. Describes a type of girderless floor construction in which the reinforcing bars are laid in two directions only.

North Western Expanded Metal Co., 934 Old Colony Building, Chicago, Ill.
Designing Data. Catalog. 6 x 9 in. 94 pp. Illustrated. Describes most efficient use of Econo Expanded Metal Reinforcing.
Formless Concrete Construction. Catalog. 6 x 9 in. 80 pp. Illustrated. Describes use of T-Rib Chanelath, a form and reinforcing for concrete.

Truscon Steel Co., Youngstown, Ohio.
Hy-Rib and Metal Lath. 18th ed. Catalog. 8½ x 11 in. 64 pp. Illustrated. Gives properties of laths, specifications, special uses and views of installations.

LUMBER

Arkansas Soft Pine Bureau, 802 Boyle Bldg., Little Rock, Ark.
Arkansas Soft Pine Handbook. Catalog. 8½ x 11¼ in. 62 pp. Illustrated. Concise, technical information regarding physical character, uses, and including Grading Rules and Standard Molding Designs.
The Home You Long For. Booklet. 8¼ x 11 in. 32 pp. Illustrated. Folio intended for the layman. Contains 18 homes by Robert Sayfarth, Architect, Chicago. Of general interest to architects, but does not contain technical information.

California Redwood Assn., 206 Marvin Bldg., San Francisco, Calif.
California Redwood Homes. Booklet. 6 x 9 in. 16 pp. Illustrated. Describes the use of Redwood Lumber for various places and conditions in the building of the home.

Long Bell Lumber Co., R. A. Long Building, Kansas City, Mo.
The Post Everlasting. Booklet. 10½ x 7½ in. 32 pp. Illustrated. Information regarding creosoted yellow pine fence posts, barn poles, paving blocks, etc.
Poles That Resist Decay. Booklet. 9¼ x 4 in. 16 pp. Illustrated. Poles for telegraph, telephone, high power transmission lines.

Pacific Lumber Company of Illinois, The, 1105 Lumber Exchange Bldg., Chicago.
Engineering Digest. Redwood Information Sheets. 1. General Data Sheet on Redwood, its Production and Uses. 2. Tanks and Vats for Water, Acid and Alkali Solutions and Oil. 3. Pipe for Water, Chemicals and Sewage Conveying. 6. Farm and Dairy Buildings and Equipment, Silos, Tanks, Pipe, Outbuildings, Irrigation Flumes, Drainage Boxes, Greenhouses, Etc. 9. Railroad Construction and Equipment. 10. Industrial Building Materials. 11. Residential Building Materials.

METAL LATH—See Lath, Metal and Reinforcing

METALS

American Sheet & Tin Plate Co., Frick Building, Pittsburgh, Pa.
Reference Book. Pocket Ed. 2½ x 4½ in. 168 pp. Illustrated. Covers the complete line of Sheet and Tin Mill Products.
Copper—Its Effect Upon Steel for Roofing Tin. Catalog. 8½ x 11 in. 28 pp. Illustrated. Describes the merits of high grade roofing tin plates and the advantages of the copper-steel alloy.
Apollo and Apollo-Keystone Galvanized Sheets. Catalog. 8½ x 11 in. 20 pp. Illustrated.
Research on the Corrosion Resistance of Copper Steel. Booklet. 8½ x 11 in. 24 pp. Illustrated. Technical information on results of atmospheric corrosion tests of various sheets under actual weather conditions.
Facts Simply and Briefly Told. Booklet. 8½ x 11 in. 16 pp. Illustrated. Non-technical statements relating to Keystone Copper Steel.
Black Sheets and Special Sheets. Catalog. 8½ x 11 in. 28 pp. Illustrated. Describes standard grades of Black and Uncoated Sheets, together with weights, bundling tables, etc.
Bright Tin Plates. Catalog. 8½ x 11 in. 16 pp.

METAL TRIM—See Doors, Windows and Trim, Metal

MORTAR COLORS

Clinton Metallic Paint Co., Clinton, N. Y.
Clinton Mortar Colors. Booklet. 3½ x 6⅜ in. 8 pp. Illustrated. Complete description of Clinton Mortar Colors with color samples.

OFFICE SUPPLIES

Dixon Crucible Co., Joseph, Pencil Dept., 224 J. Jersey City, N. J.
Finding Your Pencil. Booklet. 6¼ x 3¼ in. 16 pp. Illustrated.
The First Five. Booklet. 3½ x 5¼ in. 10 pp. Illustrated.
A Study in Sepia. Booklet. 7 x 4½ in. 5 pp. Illustrated.

PAINTS, STAINS, VARNISHES AND WOOD FINISHES

Berry Brothers, Detroit, Michigan.
"Natural Woods and How to Finish Them." Booklet. 6½ x 4¾ in. 95 pp. Containing technical information and advice concerning wood finishing.
Beautiful Homes." Booklet. 8½ x 6½ in. 26 pp. Illustrated in colors. Giving information to home builders and others on interior finishing.

Bird & Company, J. A. & W., 88 Pearl St., Boston, Mass.
Ripolin Specifications. Booklet. 8 x 10½ in. 12 pp. Description. Contains twenty-one carefully prepared specifications for undercoats for different types of work.

Boston Varnish Co., Everett Station, Boston, Mass.
The Inviting Home. Booklet. 5½ x 9 in. 16 pp. Color Plates. A briefly worded book on painting for the busy architect or decorator.
The White Enamel Specification Book. 6 x 9 in. 12 pp. Explaining the use of Kyanize White Enamel on interior or exterior surfaces.

Cabot, Inc., Samuel, Boston, Mass.
Cabot's Creosote Stains. Booklet. 4 x 8½ in. 16 pp. Illustrated.

Creo-Dipt Company, Inc., 1025 Oliver St., Tonawanda, N. Y.
Dixie White. Folder. 3½ x 8 in. 3 pp. Illustrated. A heavy white stain which produces the whitewashed effect.

Fox Co., M. Ewing, New York, N. Y.
Calcimines. Booklet. 3¼ x 6¼ in. 8 pp. Color cards.

PAINTS, STAINS, VARNISHES AND WOOD FINISHES — Continued

O'Brien Varnish Co., 1121 Washington Avenue, South Bend, Ind.
That Magic Thing Called Color. Booklet. 5½ x 8½ in. 24 pp. Illustrated. Short treatise on the use of color in the home, special reference to walls and ceilings.
Architects' Specification Manual. 8½ x 11 in. 50 pp. Complete specifications for all paint products.

The Sherwin-Williams Co., 882 Canal Road, Cleveland, Ohio.
A Book of Painting and Varnishing Specifications. 8½ x 11 in. 30 pp. A text book on painting and finishing.
Announcement of Sherwin-Williams Flat-Tone Multi-Color Effects. Booklet. 2½ x 6 in. 10 pp. Illustrated. Development of a new system of wall decoration.
Monthly Architectural Bulletin. 8½ x 11 in. Bulletin issued periodically on painting and finishing.

Smith & Co., Edward, P. O. Box 76, City Hall Station, New York, N. Y.
Architect's Hand Book. 4¾ x 7½ in. 24 pp. Specifications and suggestions for painting, varnishing, enameling, etc.

Sonneborn Sons, Inc., L., Dept. 4, 264 Pearl Street, New York.
Paint Specifications. Booklet. 8½ x 10¾ in. 4 pp.

The Standard Paint Company, 95 Madison Avenue, New York, N. Y.
Preservative Coatings. Booklet. 6 x 9 in. 15 pp. Illustrated. Presents in a concise manner the properties and uses of the Standard Paint Company's various paint preparations.

Truscon Laboratories, The, Cor. Caniff Avenue and Grand Trunk R. R., Detroit, Mich.
Spread the Sunshine Inside. Booklet. 5 x 8 in. 24 pp. Describes methods for light saving by the application of light reflecting enamels to interior walls of factories and workrooms.

Wadsworth-Howland Co., Inc., Boston, Mass.
Paints and Varnishes. Catalog. 5¾ x 8½ in. 140 pp. Illustrated. Covers the complete line.

PIPE

Clow & Sons, James B., 534 S. Franklin Street, Chicago, Ill.
Catalog "A." 4 x 6½ in. 706 pp. Illustrated. Shows a full line of steam, gas and water works supplies.

National Tube Co., Frick Building, Pittsburgh, Pa.
National Bulletin No. 11, History, Characteristics and Advantages of National Pipe. Catalog. 8½ x 11 in. 48 pp. Illustrated.

PLUMBING EQUIPMENT

Brunswick-Balke-Collender Co., 623 S. Wabash Avenue, Chicago, Ill.
Whale-bone-ite Seat. Booklet. 3½ x 6¼ in. 4 pp. Illustrated.
Whale-bone-ite Seat. Booklet. 3½ x 6¼ in. 8 pp. Illustrated.

Clow & Sons, James B., 534 S. Franklin Street, Chicago, Ill.
Catalog "M." 9¼ x 12 in. 184 pp. Illustrated. Shows complete line of plumbing fixtures for Schools, Railroads and Industrial Plants.

Crane Company, 836 S. Michigan Avenue, Chicago, Ill.
Crane Products in World Wide Use. Catalog. 5 x 9½ in. 24 pp. Illustrated.
Plumbing Suggestions for Home Builders. Catalog. 3 x 6 in. 80 pp. Illustrated.
Plumbing Suggestions for Industrial Plants. Catalog. 4 x 6½ in. 43 pp. Illustrated.

Hess Warming & Ventilating Co., 1205D Tacoma Bldg., Chicago, Ill.
Hess Sanitary Steel Medicine Cabinets. Booklet. 4 x 6 in. 16 pp. Illustrated.

Kohler Co., Kohler, Wis.
Kohler of Kohler. 5½ x 8 in. 48 pp. Illustrated catalog. Shows complete line of plumbing fixtures.
Kohler Architect Specification Forms. 8½ x 11 in. Loose leaf portfolios intended to cover individual specifications. Separate illustrations and specification sheets provided.

Maddock's Sons Co., Thomas, Trenton, N. J.
Highest Grade Standardized Plumbing Fixtures for Every Need. Catalog. 5 x 7½ in. 94 pp. Illustrated. Covers the complete line.
Bathroom Individuality. Booklet. 6 x 9 in. 28 pp. Illustrated. Showing view of complete bathrooms with complete descriptions of floor plans.
Specifications for plumbing fixtures. Booklet. 9 x 12 in. 8 pp. Tables of specifications for industrial buildings, schools, apartments, hotels, etc.

Speakman Company, Wilmington, Del.
Speakman Showers and Fixtures. Catalog. 4½ x 7½ in. 250 pp. Illustrated. Catalog of Modern Showers and Brass Plumbing Fixtures, with drawings showing layouts, measurements, etc.
Toned Up In Ten Minutes. Booklet. 7½ x 10½ in. 16 pp. Illustrated. Modern Showers and Washups for Industrial Plants, showing the sanitary method of washing in running water.

PUMPS

Goulds Mfg. Co., The, Seneca Falls, N. Y.
Set of Twenty Bulletins. 7½ x 10⅝ in. 12 to 32 pp. each. Illustrated. Covers complete line of power and centrifugal pumps for all services.
Catalog "K." 6 x 9 in. 216 pp. Illustrated. Covers complete line of smaller size pumps.

REFRIGERATION

Johns-Manville, Inc., Madison Avenue and 41st Street, New York, N.Y.
Johns-Manville System of Refrigeration. Booklet. 3½ x 6 in. 16 pp. Illustrated.

ROOFING

Philip Carey Co., The, Cincinnati, Ohio.
Architects Specifications for Carey Building Material. 8½ x 11 in. 48 pp. Illustrated.

Johns-Manville, Inc., Madison Avenue and 41st Street, New York.
Johns-Manville Asbestos Shingles. Booklet. 3½ x 6 in. 32 pp. Illustrated. Prices, construction date and specifications.
Johns-Manville Roofing and Building Materials. Catalog. 3½ x 6 in. 24 pp. Illustrated. Describes building materials such as asbestos wood, sound deadening and insulating felts, waterproofing, etc.

SELECTED LIST OF MANUFACTURERS' PUBLICATIONS — *Continued from page 58*

ROOFING — Continued

Keasbey & Mattison Co., Ambler, Pa.
Ambler Asbestos Shingles. Catalog. 5½ x 8½ in. 40 pp. Illustrated.
Ambler Asbestos Corrugated Roofing and Siding. Catalog. 8½ x 11 in. 36 pp. Illustrated. Standard Purlin Spacing Tables.
Ambler Asbestos Corrugated Roofing and Siding. Catalog. 8½ x 11 in. 20 pp. Illustrated. Prices and specifications.
Ambler Asbestos Building Lumber. Catalog. 8½ x 11 in. 32 pp. Illustrated.

The Standard Paint Company, 95 Madison Avenue, New York, N. Y.
Instructions for Laying Built-up Roofs. Booklet. 8½ x 11 in. Illustrated.

Standard Paint Company, 95 Madison Avenue, New York, N. Y.
Roofing Facts Worth Knowing. Booklet. 6 x 9 in. 16 pp. Illustrated.

N. & G. Taylor Company, 300 Chestnut Street, Philadelphia, Pa.
Selling Arguments for Tin Roofing. Booklet. 6¼ x 9¼ in. 80 pp. Illustrated. Describes the various advantages of the use of high grade roofing tin, gives standard specifications, general instructions for the use of roofing tin, illustrates in detail methods of application.
No. 1 of Nolan's Series of Standard Specification Forms and Condensed Descriptions. Leaflet. 8½ x 11 in. 12 pp. Standard forms and details for specifications of building construction arranged for permanent filing and reference. This is No. 1 of the series, giving technical information on tin roofing, for the use of architects, engineers and builders.
Roof Designs. Booklet. 8½ x 11 in. 16 pp. Illustrated. Presenting some of the merits of tin as a roofing material.
Service Sheets. Set of four. Illustrated. Large size working drawings, detailing various methods of applying tin roofing, also valleys, gutters, flashings, also heavy ribbed roofing, domes, etc.

SEWAGE DISPOSAL

Kewanee Private Utilities, 442 Franklin St., Kewanee, Ill.
Specification Sheets. 7¾ x 10¼ in. 46 pp. Illustrated. Detailed drawings and specifications covering water supply and sewage disposal systems.

SHEATHING

Bishopric Mfg. Company, 103 Este Ave., Cincinnati, Ohio.
Homes Built on the Wisdom of Ages. Catalog. 6 x 9 in. 48 pp. Illustrated. Describing the use of Bishopric Stucco-Board and Bishopric Sheathing Board.

STONE, BUILDING

Harrison Granite Company, 200 Fifth Avenue, New York, N. Y.
Harrison Granite Company, Clientele. 3¾ x 8¾ in. 24 pp. Illustrated. A partial list of clients with illustrations of examples of monuments and mausoleums.

Indiana Limestone Quarrymen's Association, Box 766, Bedford, Indiana.
Vol. 1. Indiana Limestone Library. 6 x 9 in. 36 pp. Illustrated. Giving general information regarding Indiana Limestone, its physical characteristics, etc.
Vol. 4. Indiana Limestone Bank Book. 6 x 9 in. 48 pp. Illustrated. Descriptive of the use of Indiana Limestone for bank buildings, with partial list of buildings in which it has been used.
Vol. 27. Designs for Houses of Indiana Limestone. 8½ x 11 in. 32 pp. Illustrated. Being the best designs submitted in competition for a detached residence faced with Indiana Limestone conducted by *The Architectural Review.*

National Building Granite Quarries Association, Inc., 31 State St., Boston, Mass.
Booklet. 8½ x 11 in. 16 pp. Illustrated. Contains nineteen color plates of standard American Building Granites; specifications; classification listing colors, textures, and producers; detail sheets illustrating relative value of mouldings, economical design and typical construction; a general description of granite including uses, finishes, tests, etc.

STORE FRONTS

Kawneer Co., The, Niles, Mich.
Kawneer Solid Copper Store Fronts. Catalog. "K." 8½ x 11 in. 32 pp. Illustrated. Information about various members used in the pioneer Kawneer construction.
A Collection of Successful Designs. Catalog. 9¼ x 6½ in. 64 pp. Illustrated. Showing by use of drawings and photographs many types of Kawneer Solid Copper Store Fronts.

Zouri Drawn Metals Co., B. J. 10, Chicago Heights, Ill.
Architects' Catalog. 8¾ x 11¾ in. 86 pp. Illustrated. Showing a true copy of the approval of the Underwriters' Laboratories. Showing a proper glazing specification, based on the Underwriters' Report.
Catalog B. J. 8 6 x 9 in. 68 pp. Illustrated. Key to Getting the People In.

STUCCO, MAGNESITE

American Materials Company, 101 Park Avenue, New York; Weed Street and Sheffield Avenue, Chicago, Ill.
Elastica, the Stucco of Permanent Beauty. Catalog. 8½ x 11 in. 32 pp. Illustrated. Treatise on composition and application of Elastica Stucco.

Muller, Franklyn R. Co., Waukegan, Ill.
Everlastic Magnesite Stucco. Booklet. 8½ x 11 in.

United States Materials Co., Weed Street and Sheffield Avenue, Chicago, Ill. See American Materials Co.

STUCCO BASES

Bishopric Manufacturing Co., 103 Este Avenue, Cincinnati, Ohio.
Homes Built on the Wisdom of Ages. Catalog. 6 x 9 in. 48 pp. Illustrated. Describing the use of Bishopric stucco board and Bishopric sheathing board.

TERRA COTTA

Atlantic Terra Cotta Co., 1170 Broadway, New York, N. Y.
Questions Answered. Booklet, 7½ x 5¼ in. 32 pp. Illustrated.

TERRA COTTA — Continued

National Terra Cotta Society, 1 Madison Avenue, New York, N. Y.
Standard Construction, Indexed, bound volume. 10½ x 16 in. 90 pp. 70 Illustrations. Standard forms of terra cotta construction with short article.
"The School." 10½ x 13½ in. 34 pp. 92 Illustrations. Types of school buildings with short descriptive articles. Volume I, brochure series.
"The Theatre." 10½ x 13½ in. 36 pp. 102 Illustrations. Types of theatre buildings with short descriptive articles. Volume II, brochure series.
"The Store." 10½ x 13½ in. 34 pp. 60 Illustrations. Types of store buildings with short descriptive articles. Volume III, brochure series.

Northwestern Terra Cotta Co., The, 2525 Clybourn Ave., Chicago, Ill.
Booklet. 8¼ x 11 in. 77 pp. Illustrated. Showing in a concise way the usefulness of terra cotta.

THERMOSTATS—See Heating Equipment

TILE, FLOOR AND WALL

Associated Tile Manufacturers, The, Beaver Falls, Pa.
Bring the Crowds to Your Market. Booklet. 8½ x 11 in. 16 pp. Illustrated. The use of Tile for the modern sanitary market.
Swimming Pools. Booklet. 8½ x 11 in. 32 pp. Illustrated. A handbook on swimming pools and their construction.

Norton Company, Worcester, Mass.
Alundum Safety Tile. Booklet. 5 x 8 in. 15 pp. Illustrated. Description of material and its installation.
Tests of Alundum Tile. Booklet. 5 x 8 in. 18 pp. Illustrated. Describes its composition and proves its adaptability for its innumerable purposes.

TILE, HOLLOW

Hollow Building Tile Association, Dept. 1812, Conway Bldg., Chicago, Ill.
Handbook of Hollow Building Tile Construction. 8½ x 11 in. 104 pp. Illustrated. Complete treatise on most approved methods of hollow tile building construction and fireproofing.

National Fire Proofing Co., 250 Federal St., Pittsburgh, Pa.
Standard Wall Construction Bulletin 174. 8½ x 11 in. 32 pp. Illustrated. A treatise on the subject of hollow tile wall construction.
Industrial Housing Bulletin 172. 8½ x 11 in. 14 pp. Illustrated. Photographs and floor plans of typical workingmen's homes.
Natco on the Farm. 8½ x 11 in. 38 pp. Illustrated. A treatise on the subject of fire safe and permanent farm building construction.
Fireproof Buildings of Natco Hollow Tile. Booklet 8½ x 11 in. 16 pp. Illustrated. Showing the use of Natco Hollow Tile for private residences.

VALVES

Crane Co., 836 S. Michigan Ave., Chicago, Ill.
No. 50 Steam Pocket Catalog. 4 x 6½ in. 775 pp. Illustrated. Describes the complete line of the Crane Co.

Jenkins Bros., 80 White Street, New York.
The Valve Behind a Good Heating System. Booklet. 4½ x 7¼ in. 16 pp. Color plates.
Jenkins Valves for Plumbing Service. Booklet. 4½ x 7¼ in. 16 pp. Illustrated.

VENTILATION

American Ventilating Company, The, Martin Bldg., Pittsburgh, Pa.
Adequate Ventilation. Catalog. 8¼ x 10¾ in. 24 pp. Illustrated. Explaining the fundamentals of proper ventilation. Methods of determining number and size of ventilators.
American–Larson Suction Ventilators. Catalog. 8¼ x 10¾ in. 24 pp. Illustrated. Description contains valuable data on adequate ventilation. All construction details fully illustrated and described. Gives methods of determining number and size of ventilators required for a given job, also charts, giving dimensions and prices.

Globe Ventilator Co., Dept. P., Troy, N. Y.
Globe Ventilator's Catalog. 6 x 9 in. 32 pp. Illustrated.

WALL BOARDS

Carey Co., The Philip, Cincinnati, Ohio.
Carey Board for Better Building. Catalog. 6 x 9 in. 32 pp. Illustrated.

WATERPROOFING

Anti-Hydro Waterproofing Co., 299 Broadway, N. Y.
Waterproofing. Booklet. 3½ x 6 in. 4 pp. Methods used for waterproofing concrete and mortars.

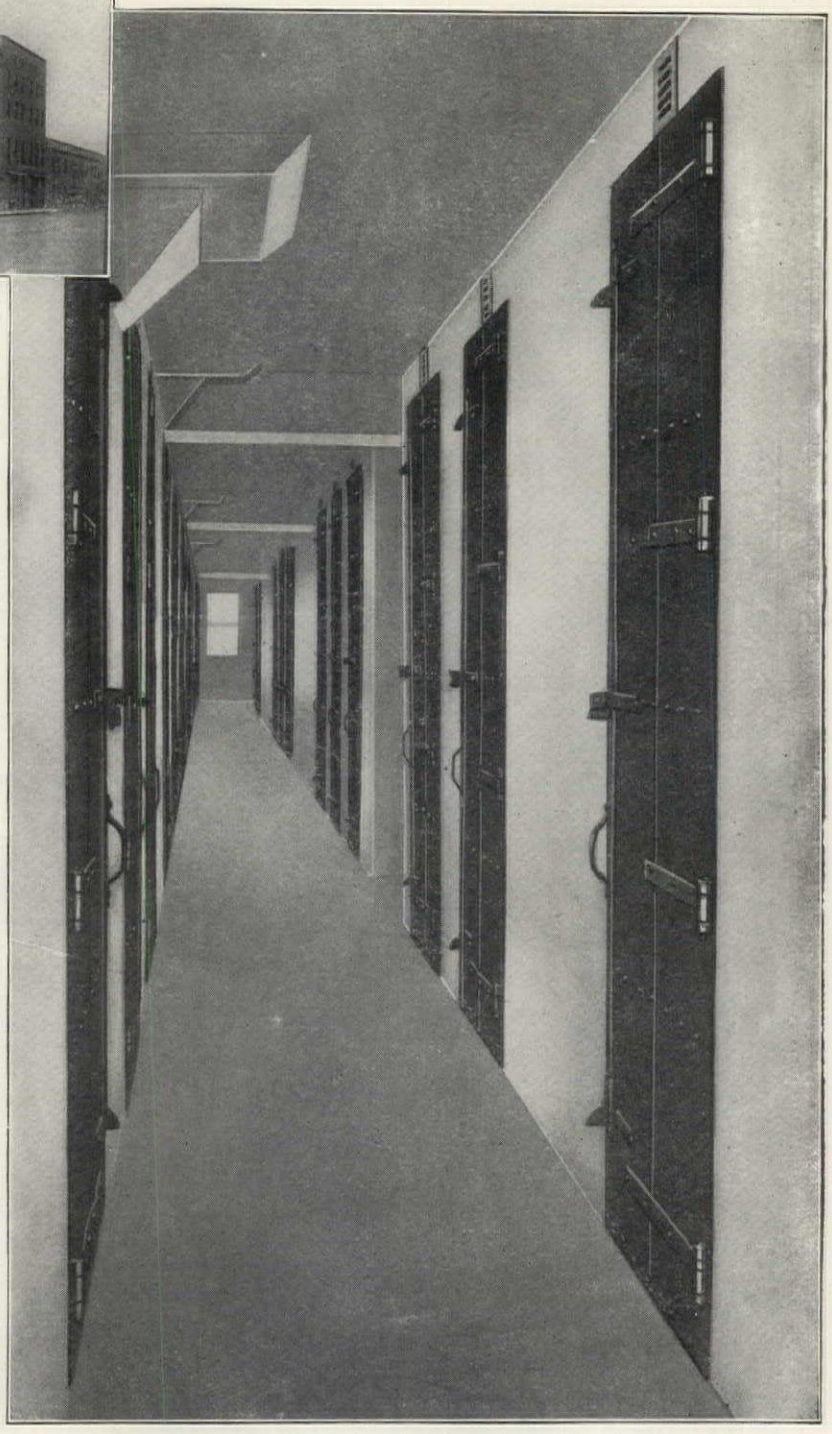
Minwax Company, Inc., 18 East 41st Street, New York, N. Y.
Waterproofing Exposed Walls. Bulletin No. 22. 8½ x 10 in. 12 pp. Illustrated. Descriptions and specifications dealing with two methods of dampproofing above grade walls, viz., Minwax clear waterproofing or Minwax brick and cement coating, and Minwax asphaltic dampproofing No. 300.
Products Bulletin. 8½ x 5½ in. 24 pp. Illustrated with drawings. Condensed catalog of Minwax products for standardized structural protection.

Sandusky Cement Co., Dept. F, Cleveland, Ohio.
Medusa Waterproofing. Booklet. 6¾ x 9 in. 37 pp. Illustrated.

Standard Paint Company, The, 95 Madison Ave., N. Y.
Impervite. Circular. 8½ x 11 in. 4 pp. Illustrated. An integral waterproofing compound for concrete, stucco, cement, mortar, etc.

"The Most Rigid Wall I've Ever Seen"

—Said an Observer



Heavy Fire Doors Hung on 2½-Inch Metal Lath Partition

THE partitions are 12′ 9″ high of 24 gauge Kno-Burn Metal Lath with ¾″ Nemco Cold-Formed Channels spaced 12″ o. c. No cross furring was used. This framework was plastered on both sides with portland cement mortar. Note perfect alignment secured.

Doors have been swinging to and fro and The Underwriters' Tests have proven the partitions absolutely fireproof and satisfactory in every respect. This construction is to be used in another local warehouse.

Kno-Burn
METAL LATH

Contrast the saving as compared with tile or brick partition necessary to sustain such heavy loading.

Write for samples of Kno-Burn and information on this cost-saving construction.

NORTH WESTERN
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Cincinnati, Ohio

Wm. C. Bunyan Co.
Lockland, Ohio

NORTHWESTERN EXPANDED METAL CO.
CHICAGO

SELECTED LIST OF MANUFACTURERS' PUBLICATIONS — *Continued from page 60*

WATERPROOFING—Continued

Toch Brothers, 320 Fifth Ave., New York, N. Y.
Toxement. Booklet. 5¼ x 8½ in. Illustrated. 24 pp. Describes Toxement, an integral waterproofing compound for concrete, stucco, cement, mortar, etc.

Truscon Laboratories, The, Cor. Caniff Avenue and Grand Trunk R. R., Detroit, Mich.
Structural Waterproofing. Handbook. 8½ x 11 in. 100 pp. Illustrated. A reliable and trustworthy text-book on modern waterproofing practice.

WATER SOFTENERS

Permutit Company, The, 440 Fourth Ave., New York, N. Y
Permutit-Water softened to No (Zero) Hardness. Booklet. 8½ x 11 in. 32 pp. Describing the original Zeolite process of softening water to zero hardness. An essential for homes, hotels, apartment houses, swimming pools, laundries, textile mills, paper mills, ice plants, etc., in hard water districts.

WINDOW HARDWARE

Samson Cordage Works, Boston, Mass.
Catalog 3½ x 6¼ in. 24 pp. Illustrated. Covers complete line.

L. P. T. Specialty Co., Madison Terminal Bldg., Chicago, Ill.
Details and Specifications for Counter Balanced Window Hardware. 8½ x 11 in. Illustrated with drawings and blue prints.

Smith & Egge Mfg. Co., The, Bridgeport, Conn.
Catalog No. 10. 6¾ x 9 in. 42 pp. Illustrated. Covers a complete line of chains, hardware and specialties.

WINDOWS, CASEMENT

Crittall Casement Window Co., 2703 East Atwater Street, Detroit, Mich.
Catalog No. 18. 9 x 12 in. 56 pp. Illustrated.

Detroit Steel Products Co., 2055 East Grand Bldg., Detroit, Mich.
Windowalls—Their Cost and Advantages. Catalog. 8¼ x 5½ in. 32 pp. Illustrated.

Hoffman Mfg. Co., Andrew, 900 Steger Building, Chicago, Ill.
Hoffman Casements. Architects' Portfolio. 8½ x 11 in. Loose-leaf. Large scale working details for mill-work and installation.
F. S. Details 20 x 23 in. and 15 x 22 in. Working details for mill-work and installation.
Hoffman Casements Catalog. 7 x 8½ in. 16 pp. Illustrated.

Hope & Sons, Henry, 103 Park Avenue, New York.
Catalog. 12¼ x 18½ in. 30 pp. Illustrated. Full size details of outward and inward opening casements.

International Casement Co., Inc., Jamestown, N. Y.
Casements for Banks and Public Buildings. Catalog. 8½ x 11 in. 24 pp. Illustrated. Shows construction of steel windows and surrounding masonry.

WOOD—See Lumber

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(Signed) ALBERT J. MACDONALD, *Editor.*
Rogers and Manson Company.

Sworn to and subscribed before me this 14th day of March, 1921.
ROBERT SWEET,
Notary Public.

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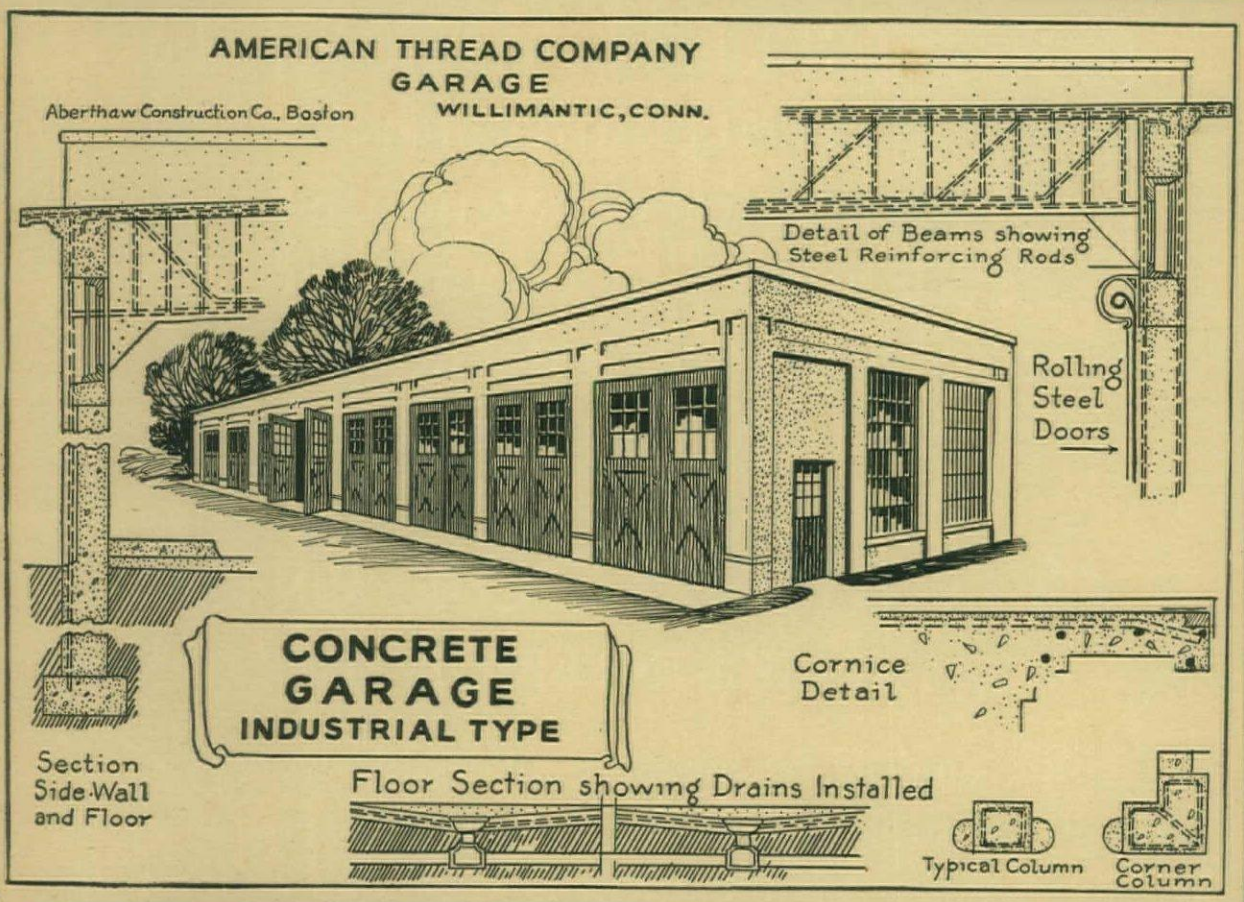

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