# AMERICAN BUILDER

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## American Builder

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VOL. 30 — December, 1920 — No. 3


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A Slippery Sidewalk Door—

*Are you doing your part to protect pedestrians against slipping accidents in rainy weather?*

Specify

# Firmtread Floor Plates

For Safety and Economy

SAFETY FIRST

## "Firmtread"

### a safeguard against accidents

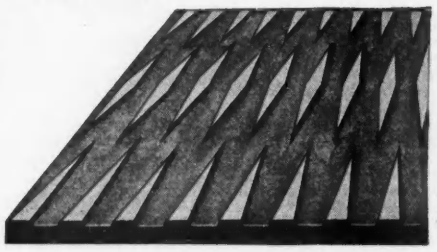
Raised diamond provides continuous drain for water in all directions—no pockets in which water can collect and form ice.

Clean cut edge of diamond, similar to the hot rolled edge of a square bar, secured by rolling the design, gives greater resistance to slipping than the rounded edge of pressed patterns.

Extra high diamond prolongs the life of the plate—other plates soon wear smooth and lose their safety feature.

Not all diamond patterns are "Firmtread"—

But "Firmtread" is the only floor plate with all of these features.



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# Short Talks by the Editor


# A WORLD-WIDE BUYERS' GUIDE

TEN thousand copies of this issue of the AMERICAN BUILDER are being mailed to foreign buyers all around the world. This is in addition to our regular subscription list in the United States of more than 40,000.

These foreign buyers have been personally selected by our Vice-President, Mr. William A. Radford, Jr., during the past fifteen months, in connection with his investigations of foreign trade opportunities, in which work he has traveled more than fifty thousand miles, visiting forty-nine different countries.

He has selected for this foreign mailing of the AMERICAN BUILDER, 10,000 of the most influential officials concerned with building construction, and the import merchants who specialize on construction materials, tools and machinery. He has selected these names after personal investigation into rates of foreign exchange, import regulations and public buying sentiment in the various foreign countries—all matters of very great importance to the conduct of a successful foreign trade. The result is that we are able to direct these export copies of the AMERICAN BUILDER into just those foreign markets that are most favorable at this time.

We believe that all of our subscribers here at home, as well as our advertisers, will be pleased to know that beginning with the December number the AMERICAN BUILDER will take your message of American building methods, materials, equipment, tools and supplies to every country on earth.

**Write American Builder Advertisers**

We present in this issue our Annual Directory of American building materials, tools and equipment. Preserve this Directory, use it often. The goods listed are produced by the most reliable and enterprising concerns, and we recommend them to you. These firms solicit your patronage. Write them for catalogs, prices, etc., mentioning in each instance, if you will, that you saw the announcement in the AMERICAN BUILDER.

FRENCH

**CONSULTEZ LES ANNONCES DE L'AMERICAN BUILDER**

**Nous publions dans ce numéro notre Almanach Annuel d'Adresses pour matériaux de construction, outils et équipement. Gardez cet almanach et consultez le souvent. Les marchandises classifiées sont celles des firmes les plus sures et des plus enreprenantes et nous vous les recommandons chaudement. Ces firmes sollicitent votre clientèle. Demandez leur leur catalogue, leurs prix, etc. en mentionnant à chaque reprise que vous avez vu leur annonce dans l' "American Builder".**

SPANISH

**ESCRIBA A LOS ANUNCIANTES DEL AMERICAN BUILDER.**

**Presentamos en este número nuestro Directorio Anua' de los materiales de construcción, herramientas y equipos. Conserve este directorio; úselo con frecuencia. Los artículos clasificados se producen por firmas de crédito y de espíritu emprendedor, y los podemos recomendar a Ud. Estas casas solicitan vuestro patrocinio. Pídales sus catálogos, precios, etc., mencionando en cada ocasión, si Ud. gusta, que el anuncio lo vió en el American Builder.**

ITALIAN

**SCRIVETE AGLI AVVISANTI DELL' "AMERICAN BUILDER"**

**Nel presente numero pubblichiamo la nostra guida annuale dei materiali da costruzione, attrezzi del mestiere e tutto l'occorrente per l'erezione dei fabbricati. Conservatevi questa guida e servitevene spesso. I varii articoli enumerati vengono prodotti da ditte serie e competenti, e noi vi raccomandiomo di dare ad esse la preferenza. Queste ditte sollectano la vostra clientela. Scrivete per domadare catalogo, prezzi, ecc., ma non dimenticate mai di dire nelle lettere che avete letto l'avviso nell' "American Builder".**

RUSSIAN

**ПИШИТЕ AMERICAN BUILDER (АМЕРИКАНСКАГО СТРОИТЕЛЯ) ОБ'ЯВИТЕЛЯМ**

Мы представляем в этом изданіи наше годичное исчисленіе американских сторительных материалов, изданіи и эквитировки. Сохраните это исчисленіе; пользуйтесь им часто. Товары исчисленные продуцырованны самыми верными и предприимчивыми предприятьями и мы рекомендуем их вам.

Эти фирмы достойны вашего доверія. Пишите им насчет каталогов цен и т. п. упомянув в каждом случае, если хотите, что вы видели это об'явление в American Builder (Американском Строителе).

(*Continued to next page*)

# SERVICE OFFERED OUR READERS IN ALL FOREIGN LANDS

(*Continued from page 97.*)

GERMAN

**ANFRAGEN AN UNSERE ANZEIGER IM "AMERICAN BUILDER" WERDEN PUENKTLICH BEANTWORTET!**

Wir bitten die Leser, diese Ausgabe unseres Jahrbuches über amerikanische Baustoffe und -werkzeuge sorgfältig aufzubewahren und oft zu benützen. Sie enthält die Anzeigen der zuverlässigsten und empfehlenswertesten Geschäfte in Amerika. Jede Anfrage um Kataloge, Preislisten, und dergleichen, an diese Häuser wird rasch beantwortet. Man unterlasse nie, sich auf die betreffende Anzeige im "American Builder" zu beziehen.

DUTCH

**ANTWOORD AAN "AMERICAN BUILDER" ADVERTEERDERS**

Wij geven in deze uitgave ons Jaarlijksch Adresboek voor Ameripaansch bouwmateriaal, werptuigen en gereedschap. Behoudt dit adresboek zorgvuldig en maakt er herhaald gebruik van. De waren er in opgegeven zijn die van de vertrouwbaarste en ondernemendste firmas die wij warm aanbevelen. Deze firmas verlangen uwe klandizie; schrijf om hun Kataloog, prijzen, enz, en vermeldt telkens da U hun advertentie hebt gezien in de American Builder.

SWEDISH

TILLSKRIF AMERICAN BUILDERS ANNONSÖRER.

Vi meddela i detta nummer vär årliga adresslista för amerikanskt byggnadsmaterial, verktyg och utrustning. Bevara denna lista och använd den ofta. De å listan upptagna varorna äro tillverkade af de mest tillförlitliga och företagsamma affärer, och vi rekommendera dem. Dessa firmor önska edert patronage. Tillskrif dem för kataloger, prisuppgifter o. s. v. och var god nämn hvarje gång ni skrifver, att ni säg adressen i The American Builder.

PORTUGUESE

**ESCREVA AOS ANNUNCIANTES DO "AMERICAN BUILDER"**

Appresentamos nesta publicação o nosso Directorio Annual de materiaes americanos para construcção, ferramenta e accessorios. Conserve este Directorio; use-o muitas vezes. Os artigos que nelle se encontram são produzidos pelas firmas mais emprehendedoras e mais consideradas, e recommendamos os mesmos a V. S. Estas ãrmas sollocitam a sua freguezia. Escreva ás mesmas pedindo Catalogos, preços e etc., mencionando en cada caso, se assim convier a V. S., que viu o annuncio no "American Builder".

MALAY

Simpan baik baik, djangan ilang, dan batjah ter-kadang kitab ini. Ini-lah ada nama-nama soedagar dan kompanies palin baik jang berdagang perkakas anika-anika, segalah roepa, bakal peroesah roema-roema, samoea boeat-an deri negri Amerika oetara (United States). Kalau angkau endak harga atau lain dari barang-barang jang terseboet di boekoe ini, sehadja ber-oelang soerat pada dia-orang, -kalau angkau maoe, dengan behasa malajoe-bilang angkau lijat nama-nja di dalam Magazine ini.

JEWISH

**שרייבט צו די „אמעריקאן ני לדער" אדווערטייזערס**

מיר גיבען אן אין דיזער אויסגאבע אונזער יעהרליכע דירעק־טאָרי פון בילדינג מאטיראל, טולס און עקווויפמענטס. בעהאלט די דירעקטאָרי און בענוצט זיך אפט דערמיט. די מאטיראל וואס ווערט אנגענעבען זיינען פראָדוצירט פון די ראיעלסטע און אָנ־גיזעהענע געשעפטען און מיר רעקאמענדירען זיי צו אייך. דיזע פירמעס ווילען אייער טרייד. שרייבט צו זיי פיר א קאטאלאג, פרייזען א. ז. וו. און גיט דאבי אן—אויב איהר ווילט אזוי גוט זיין—צו יערער נעלעגענהייט אז איהר האט געזעהן דיזען אנאנס־מענט אין דעם „אמעריקען בילדער".

JAPANESE

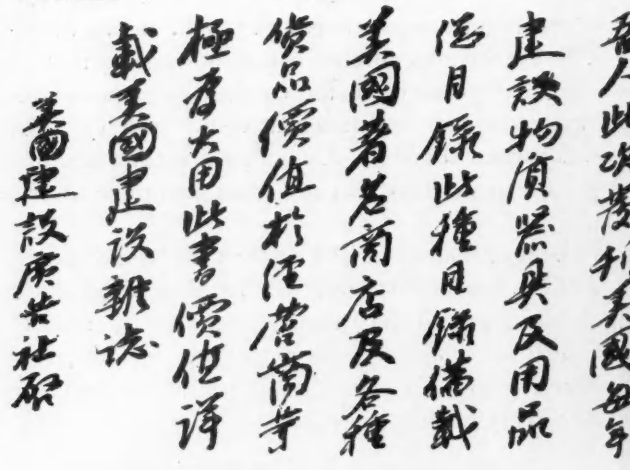
◎アメリカン ビルダー 廣告係く御 | 報あれ

今般發行の我が誌上に米國建築用に供する諸器具製造元會社の各一覽を掲載仕り候に付ては何卒此名簿御保存の上時々御便覽に供し度く候

此の中に記載致し候建築用器具製造會社は極めて信用あり且つ新式を以て名を博しおるものにて我等謹んで貴下に御推薦申上候且つ之等の會社も是非貴下との御取引を希望致し居り申候

商品目錄、價格及其他御入用の件につき各會社に御問合の節は何卒弊社出版の「アメリカン ビルダー」雜誌上にて同會社を知り得たる旨御附記なし被下度奉希候

CHINESE

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**WITH this invitation in your own tongue we trust that each of you, our foreign readers, will be encouraged to study into the English text and the illustrations which make up the bulk of this publication. If you will do so, we know that you will be rewarded by learning of many new and worth while American building methods, materials, tools and equipment—all of which are now offered to you.**

**Editors and Publishers,**
**"AMERICAN BUILDER"**

William A. Radford, Jr., in the Flower Market at Shanghai, China.

# American Influence on Oriental Building

**By William A. Radford, Jr.**

**(On a Trip Around the World in the Interests of the American Builder.)**

The Harbor Front at Shanghai, China. Shanghai Is One of the Chinese Treaty Ports and Is Second to Hong Kong in the Amount of Import and Export Business Handled. Nationals of Practically All Countries of the World Are Engaged in Foreign Business Here and Their Influence on Building Is Very Noticeable. Many of the Buildings in the Section of the City Where Foreigners Transact Their Business Are Not Different from Those Found in the United States and England.

*PEKIN, CHINA, Oct. 28, 1920.*—Nowhere in the Far East has the influence of American and European businessmen on building been felt more keenly than in the treaty ports of China—Canton, Hong Kong, and Shanghai. The business sections of these coast cities, at least those sections that lie along the harbor fronts, greatly resemble similar sections of American and British port cities. The buildings are good, many of them of reinforced concrete and many of brick and mortar, while those erected by Germans have stuccoed exteriors.

To those who have not visited these contries, this statement may appear overdrawn. But it is a fact, nevertheless. In Shanghai there are

three department stores—one owned by a British firm and two by native companies. The third one of these buildings was finished within a year. It is nine stories high and is of modern steel construction. The other two are not so large, but are equally well constructed.

Not many years ago an American building contractor came to Shanghai and erected a number of modern homes, such as will be found in an American city or town. This project was a success, as foreigners quickly purchased the homes and are living in them. They have had a decided effect on construction methods in that city.

**Reinforced Concrete Office Building of the Pacific Mail Steamship Co. at Shanghai, China. Were It Not for the Rickshas, This Picture Might Have Been Taken in an American or European City.**

**The American Legation, at Peking, Capital of China, Which Houses the United States Ambassador and His Staff.**

So it may be seen that China is fast becoming Americanized in those sections where the Americans live and do business in any numbers. They have brought American building materials and American construction machinery and have shown the natives of this country some of the efficient building methods of the United States.

It is because of this influence that I have found a most intense interest in the AMERICAN BUILDER among both foreigners and natives. The good building suggestions, pictured for those whose English is not up to a complete understanding of the text, interest these people greatly and I am certain the AMERICAN BUILDER will have considerable influence in many future building projects here.

Oregon pine, from the Pacific Coast states of the United States, is found in most of the lumber yards here. This lumber is imported in an undressed state, and is in demand because of its length, the average being 24 feet. Native lumber is seldom more than 12 feet. In Shanghai there are ten large lumber yards that handle American lumber. There are three foreign-owned and well equipped band sawmills there, also.

**Primitive Building Methods Are Still in Use in Many Parts of the Orient. This Picture Shows Natives Operating a Hand Power Pile Driver.**

For centuries Chinese carpenters estimated their lumber requirements in cubic feet. The lumber was delivered to the building job in pieces 16 by 16 inches or 20 by 20 inches. There the native, with his improvised saw—made usually of a barrel hoop tempered and

**In a Bamboo Forest. These Trees Grow Rapidly to a Considerable Size, as Will Be Noted by Comparing the Tree Trunks with the Natives in the Picture. Bamboo Is Used in Building Operations of All Kinds.**

filed—whipsawed the lumber into the required sizes. Gradually, however, the native carpenters have learned that they can secure dimensioned lumber a great deal cheaper when the labor of cutting it is figured.

One of the greatest boons to these countries will be American wallboard, when it gets to coming in quantities, and American stucco board. The outside walls of many of the native houses are of matting fastened directly to the studs. The matting is covered

**A Japanese Blacksmith at Work. His Forge and Tools Are Crude. But What Is Most Mystifying Is Why Most of the Orientals Sit Down to Work.**

**The Great Wall of China; One of the World's Ancient and Notable Construction Feats. The Wall, Which Once Protected Old China from the Mongol Hordes Is Falling Into Decay, Altho It Still Is an Impressive Sight.**

with a rough dirt plaster. The partitions also are of matting, many times covered with wall paper. With American wallboard for partitions and American stucco board for outside walls, this class of homes would be greatly improved.

Great opportunities are awaiting American manu-

**Japanese Carpenters Sawing Out Lumber with Crude Saws. American Carpenters Would Be Likely to Balk Were They Given Such Tools to Work With.**

facturers of building materials and construction machinery in the coast cities of all of these countries. While the percentage of foreign population is small, the foreigners and the progressive native businessmen are the ones who are building, and when they build they want and get modern, well-constructed buildings. To get these buildings, materials, machinery and equipment are required, and American manufacturers should be ready to furnish them.

# Woman and the Home

## The Kitchen Ideal

**SOME POINTERS ON WHAT THE HOUSEWIFE SHOULD CONSIDER WHEN TALKING OVER PLANS OF NEW HOME WITH BUILDER**

**By Julia W. Wolfe**

EVERY housewife should be able to plan a kitchen intelligently, just as she should know how to sew or cook. This does not mean a kitchen that seems convenient merely because it expresses certain pet whims or ideas, but one that measures up to some standard tests on general essential points. It is, of course, extremely important that there should be enough shelving, that the cake-turner should be in the right place, but all details are of small moment when compared to such fundamental considerations as the size of the kitchen, then amount of air and light and the general organization of the work.

Naturally, it is too late to begin to plan a kitchen after it is built, for the structural conditions are then fixed and the possibilities of arrangement are accordingly limited. This is not meant to discourage the remodeling of old kitchens, but merely to put emphasis in the right place and to force home the importance of planning the kitchen rightly at the start.

From such a viewpoint, the fundamentals of kitchen planning will be discussed under seven heads:

1. Use or function of the kitchen.
2. Exposure.
3. General size.

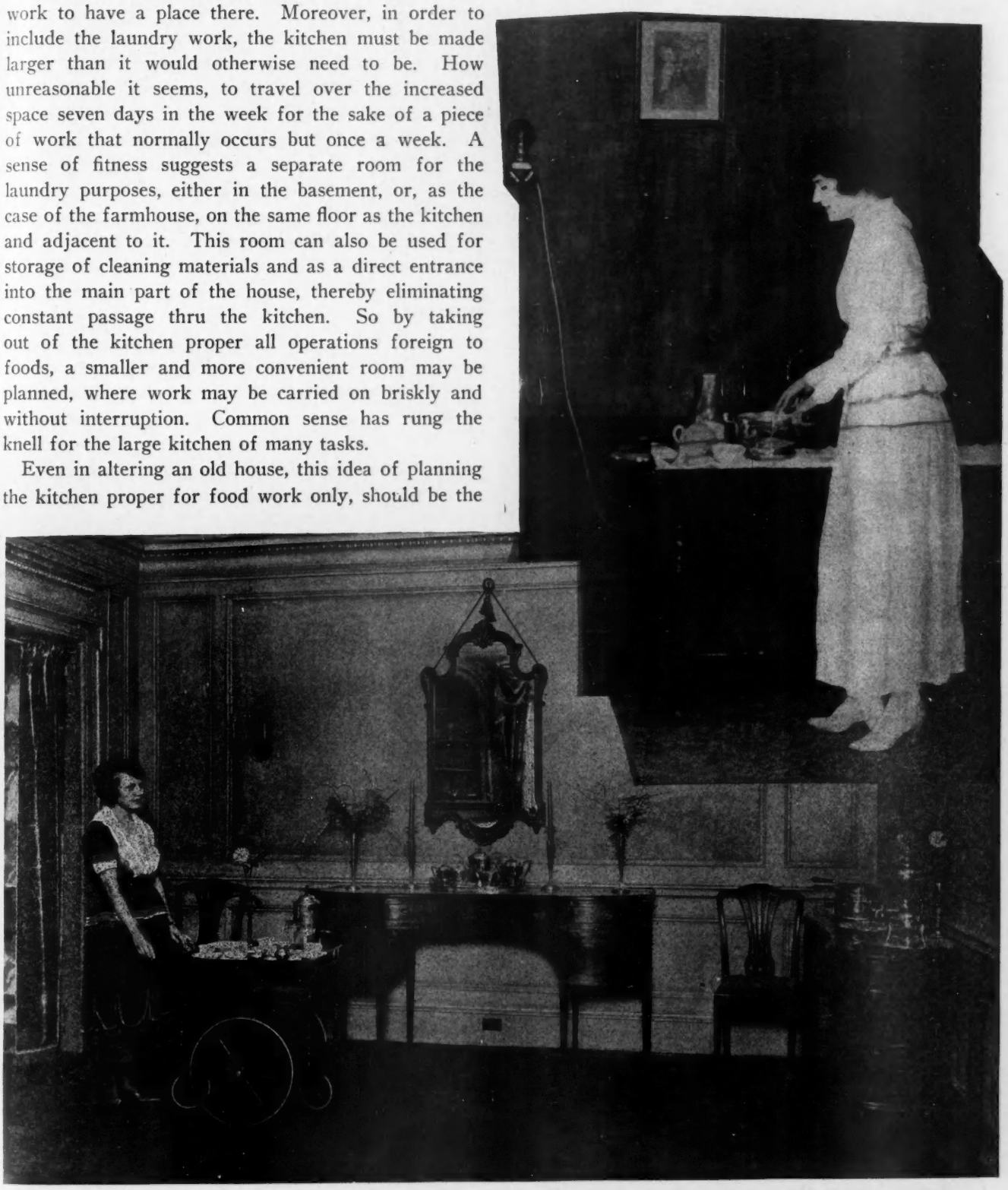
**Did You Ever Notice the Contrasts in Homes That Cost the Same Amount to Build? In Many, the Work Stopped as Soon as the Contractor Left the Job, But in Beautiful Homes Like the One Shown Above the Housewife Made a Finished Job of It. She Can Easily be Likened to a Decorative Artist.**

4. Doors.
5. Windows.
6. Arrangement of the equipment, based on the organization of the work.
7. Pantries and closets.

Customs and traditions to the contrary, it is poor logic and poor economy to plan for such features as laundry tubs and cleaning closets in the kitchen, for they are too unsanitary and too unrelated to food work to have a place there. Moreover, in order to include the laundry work, the kitchen must be made larger than it would otherwise need to be. How unreasonable it seems, to travel over the increased space seven days in the week for the sake of a piece of work that normally occurs but once a week. A sense of fitness suggests a separate room for the laundry purposes, either in the basement, or, as the case of the farmhouse, on the same floor as the kitchen and adjacent to it. This room can also be used for storage of cleaning materials and as a direct entrance into the main part of the house, thereby eliminating constant passage thru the kitchen. So by taking out of the kitchen proper all operations foreign to foods, a smaller and more convenient room may be planned, where work may be carried on briskly and without interruption. Common sense has rung the knell for the large kitchen of many tasks.

Even in altering an old house, this idea of planning the kitchen proper for food work only, should be the guiding thought. Thus, a large kitchen in which the family washing has been done, should be remodeled in such a way that all food work is grouped at one end and laundry work and passage at the other end, with the stove as the common piece of equipment between.

The location of the kitchen will, of course, depend on the remainder of the house plan and on the location of the other rooms. Theoretically, the best exposure and location for a kitchen is toward the north,

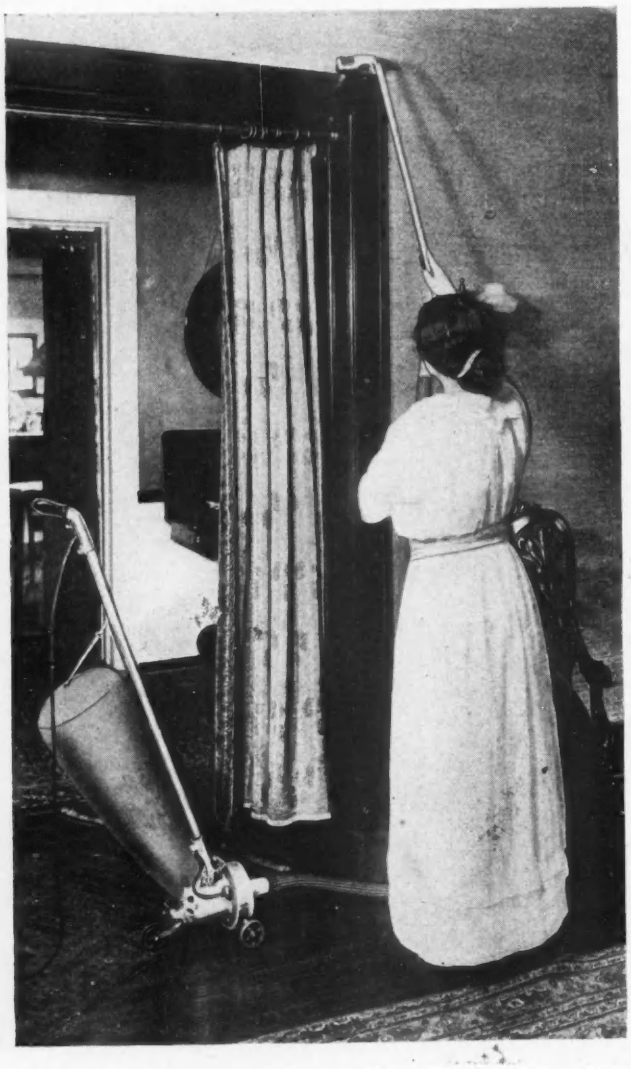


**"A Thing of Beauty Is a Joy Forever" Said the Melancholy Keats. Perhaps That Is Why We Can Always Enjoy a Cheerful, Cozy Home and Good Things to Eat. Progressive Housewives Are Introducing Many Building Conveniences Into the Modern Home. Milady Dictates to a Large Degree the Architecture of the Kitchen, Her Workshop.**

the northeast, or the northwest, with at least two outer walls for light and air. This implies either a corner location or separate wing. Southern exposures are usually at a premium for the more important living rooms.

The size of the kitchen is determined chiefly by the number of workers and by the kind of fuel to be used for cooking. In general it should always be large enough to accommodate two workers in emergency, and yet at the same time as small as convenience will allow.

A kitchen in which coal is to be used for fuel is normally larger than one in which gas is to be used, because of the larger size of the range, the need for a convenient supply of fuel, and the fact that for reasons of comfort the other pieces of furniture cannot be placed too near the stove. Years of experience in planning, equipping and using kitchen under conservation methods, show that a gas-fuel kitchen with a pass pantry need not exceed one hundred and fifty square feet of floor space, and that a coal-fuel kitchen, together with a pass and food pantry, ordinarily need not exceed an area of two hundred square feet of floor space. In general, approximately square shapes for kitchens and pantries are more convenient than are long, narrow ones. Eight feet should be the minimum width for a kitchen.



**Modern Comforts—the Keynote of Happy Homes. The Back-breaking Drudgery of Days Not So Long Ago Is Being Driven from the Home by Electrical Labor-Saving Appliances and Efficient Kitchens.**

After the size and the location of the kitchen have been determined, the placing of the openings is the next step to be considered. The subject of doors especially should be given the most deliberate attention, for the inconvenience of many a kitchen can be traced back to the presence of too many or wrongly placed doors.

Indeed, doors are a common complaint with kitchens. Often as many as five, six or seven doors may be found in the room, thereby breaking up the hall space and inviting passage in all directions. The result is scattered equipment and interrupted work. Continuity of equipment and absence of cross passage are the very essence of well-planned work space. To further such an arrangemnt, wall space is the necessary, and doors are the objectionable, feature. Therefore, every time a door is cut, one should remember that a piece of wall space is divided in two and that a new path of travel is established between two points. If at the time a kitchen is being planned a diagram were used with dotted lines to indicate the paths of travel between doors, many an inconvenient situation would be avoided.

The function of a window is essentially two-fold—to admit air and light. Naturally that arrangement of windows will be most reasonable which provides for the best diffusion of light and the best ventilation with the least amount of glass space. For, while it is poor economy to have too few windows, it is also poor economy to have too many.

It has been found that for effective results a sort of flexible relation exists between the amount of window space to be used and the size of the room to be lighted. Accordingly, the total window area for a kitchen should in general be about twenty-five per cent of the floor area. The necessary window space for any given kitchen may be thus approximated.

Ordinarily, kitchen windows should be located as far apart as possible. In the case of a corner exposure they should be placed near the partition walls rather than near the corner of the house. This arrangement insures a strong diagonal sweep of air and an even distribution of light. The tops of the windows should not be more than a foot from the ceiling so that the rising heat and odors can easily escape.

Briefly, the equipment should line the walls, leaving a free central space for working.

The three indispensable pieces of furniture in any kitchen are the table, the stove and the sink, or a temporary equivalent. These represent the three essential operations carried on there: the preparation of the food, the cooking of the food and the cleaning-up process that follows:

1. The food center requires the following equipment:

a. Table space, from 8 to 12 square feet, exclusive of sink boards.
b. Storage space.
   1. For cold foods—Ice box, dumb waiter, food pantry. Any or all of these.
   2. For dry supplies and utensils needed in food preparation—drawers and shelves. Form: Closet or cabinet.

2. The heat center requires the following equipment:
   a. Stove or range, from 2 by 3 feet to 2½ by 5 feet.
   b. Storage space—fuel box in bin, if coal or wood is to be used; pan closet for utensils, water boiler.
3. The water center requires the following equipment:
   a. Sink, 2 by 3 feet, more or less.
   b. Drain board 8 square feet or more—part to right and part to left of sink. Storage space for china and utensils. In form of closet.

**A Toy House—Yes—But it Is Inculcating the Germ of Home Ownership and Pride in the Youngsters. Even This Little House Has Electric Lights and Other Conveniences in Miniature. The Home Instinct Is So Precious That it Should Be Encouraged from Early Childhood.**

The food center should, if possible, be located at an outer wall, with the sink and range centers on inside walls and light coming from the side. Ordinarily the position of the dining room and the location of the main chimneys of the house determine the general location of the sink and range, respectively. The sink should be near or next the dining room wall, so that meal service involves a short cut of travel and but one handling of dishes.

If possible, the food and water centers should be combined into one arrangement, so that all the table space, such as the table top, the cabinet shelf and the drain board, forms a continuous work shelf on the same level. For the sake of comfort, this level should be higher than the 30 inches usual for table and sink. A height of about 32 to 35 inches will be found convenient for most workers. This means that the edge, or roll of the sink should be set at that height from the floor.

# Limestone Facing and Trim

**MANY IMPORTANT DETAILS OF ARCHES, CORNICES AND FIREPLACES, IN WHICH LIMESTONE IS USED, SHOWN ON BLUEPRINT SHEET ON PAGE 107**

BUILDERS are frequently working on structures that call for stone facing or stone trim. The use of stone has become especially important for window arches, sills, coping and cornice in brick buildings. As the artistic appearance of the building depends in large measure upon the successful application of this material, every contractor should be acquainted with the details of its design and treatment.

There are several types of stone treatment. There is the all-stone house, the house with a complete stone exterior. This facing is generally applied to a brick or hollow tile wall, each piece specified and supplied direct from the quarry or yard.

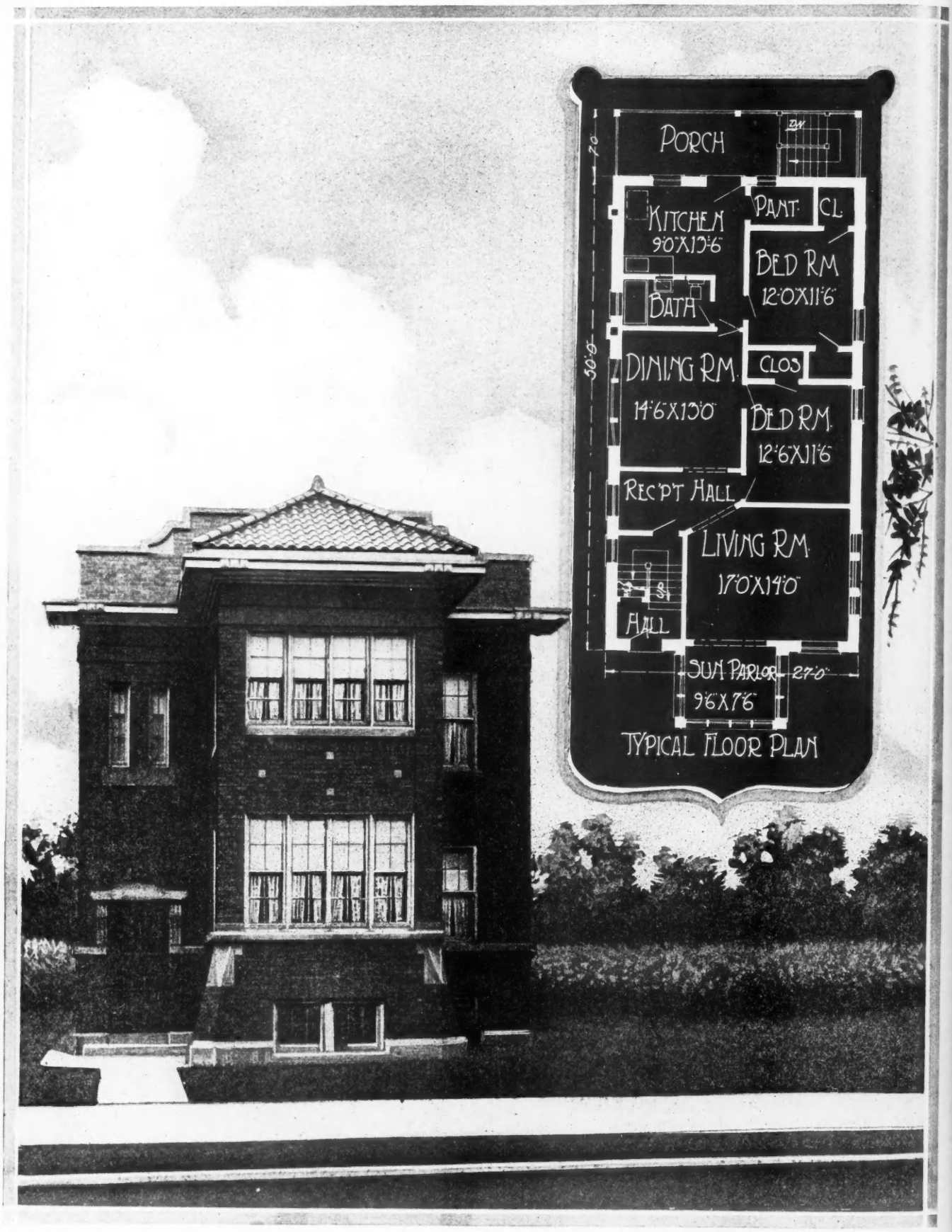
Limestone comes in three colors—buff, mixed and blue. When specifying stone facing or other trim the architect indicates which color he wants.

The color in most general use is the so-called "buff" limestone. When it comes from the quarry it is what may be called a buff, but upon exposure to the air it quickly changes to an attractive yellowish gray. The blue stone when freshly quarried is really a dark bluish gray, which also changes on seasoning to a silvery hazy gray that is very pleasing. The rarer limestone is the so-called "mixed" stone, which is a mixture of colors and occurs only in a single layer in each quarry where the buff stone joins the blue. It is variegated in color, no two blocks being alike, and when laid up in a wall produces an effect of beautiful variety. Properly handled by a skillful architect or builder, it can be so used as to convey the impression of dignified age to a new building.

Millions of cubic feet of this material are used every year in public buildings, churches, banks libraries and other structures of monumental nature. At the same time it lends itself very readily to decorative schemes in residences, hospitals, and schools and other commonplace types where enduring qualities and strength are desired.

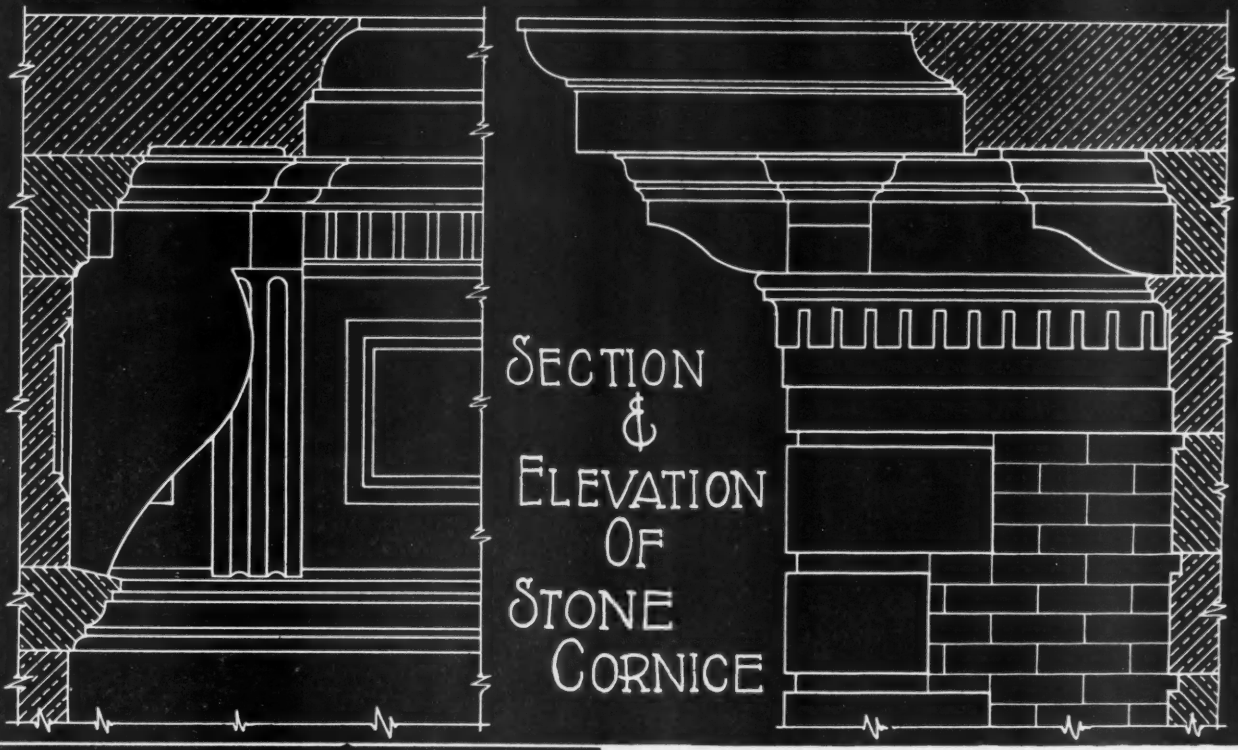
The weight-bearing strength of limestone per square foot is 135,000 pounds.

# Modern Two-Story Apartment Building with Stone Trim Details



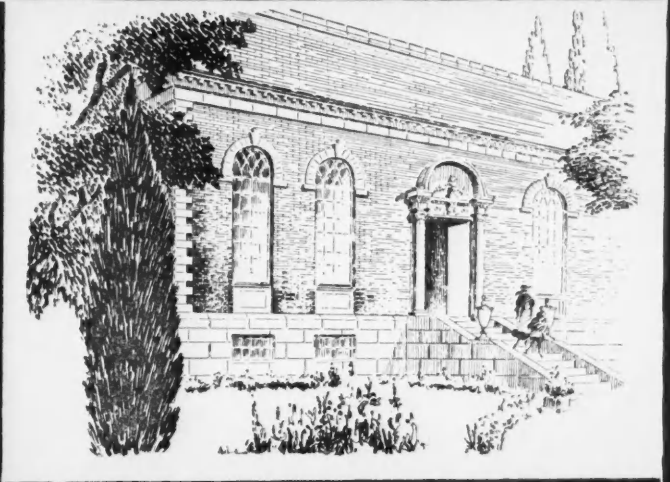

MODERN TWO-APARTMENT BUILDING. This type of building is an ideal investment for the man of moderate means because it provides both an up-to-date home and a substantial income from the extra apartment. Moreover, it is pleasing in appearance and well built of brick with face brick facade and limestone trim, details of which appear on the page opposite. Admitting a wealth of warmth and light into the apartments, the two cozy sun parlors are really extra rooms and certainly worth-while additions. There are five rooms in each apartment, living room, dining room, kitchen, and two bedrooms. The rooms are not large but comfortable and efficiently arranged, as the floor plans show. The building is 27 feet wide and 50 feet long.

# RECOMMENDED CONSTRUCTION

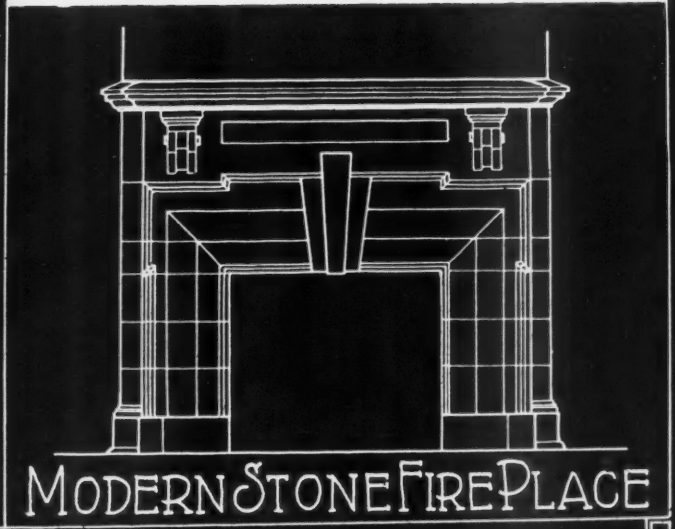


SECTION & ELEVATION OF STONE CORNICE

STONE ROUND ARCH WINDOW OPENING



STONE SQUARE ARCH WINDOW OPENING



MODERN STONE FIRE PLACE

## STONE FACING & STONE TRIM

# Building Up a Lumber Business

WM. A. TILDEN OF CORN BELT LUMBER & COAL CO. EARNS TITLE OF MIRACLE MAN BY TRANSFORMING DOWN-AND-OUT LUMBER BUSINESS INTO REMARKABLE SUCCESS IN FIVE YEARS

**By E. E. Pierson**

ALL the wonder workers are not on the stage, nor do they all depend upon legerdemain to work wonderful transformations. You have often heard the mysterious words in magic and seen the remarkable results wrought by the elusive magician. Our story deals with no words of mystery, no sleight of hand, yet the results are even more remarkable and certainly more substantial. It deals with plain English, plain methods, open and above board, which have wrought a remarkable transformation in a modern business.

You would hardly associate magic with the lumber business, but in this case it is the most appropriate word. For only such a word can describe the transformation of a decrepit, unprofitable, poorly equipped, struggling business into one of the most successful in central Illinois, all within the space of four years. Such was the feat of W. M. Tilden, president of the Corn Belt Coal and Lumber Company, Bloomington, Ill.

Here are some of the reasons: He substituted trucks for horse-drawn transportation, rebuilt discarded wagons into trailers to be hauled by the trucks, erected modern enclosed sheds for the storing and protection of lumber and other building supplies, and a modern office with up-to-the-minute methods and facilities. As a result the concern has been brought up to a high plane of efficiency and prosperity comparing favorably with any in the central west.

Mr. Tilden's major premise is: A well-kept plant is an effective advertising asset. Consequently he had the front of his lumber sheds facing on the main street attractively finished in a combination of wood and stucco with ornamental paint and signs. Two types of stucco were used, portland cement and granitoid, so that prospective customers could get a quick eye picture as they view the respective panels.


**Driving Home the Vital Question of the Hour in Effective Fashion. Side Wall of Lumber Shed Converted Into Beautiful Picture with Powerful Appeal. One of the Reasons for the Success of the Corn Belt Lumber and Coal Company, Bloomington, Ill.**

Too often the ordinary lumber yard is an eyesore, just a group of unprotected lumber piles and dilapidated sheds and fences. If pretty pictures and bright


**When Mr. Tilden Took Over This Plant it was "Down and Out." Present-day Facade of Most Modern Yard in City. A Well-Kept Plant Is an Effective Advertising Asset, Is the President's Motto. In This Building He Has Used the Building Material Which He Sells So the Customer Can Get a First-Hand Impression.**

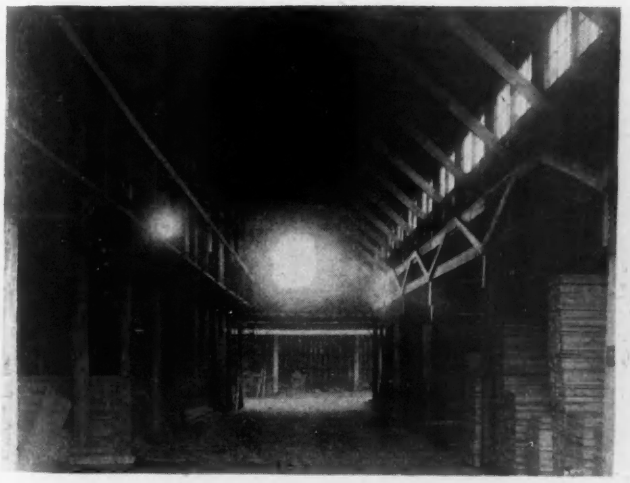
Office of Corn Belt Lumber & Coal Co. Showing Modern Equipment and Arrangement. Efficient Systems of Accounting and Bookkeeping Are Used and a Trial Balance Struck Every Night. A Rest Room for the Workmen Is in the Rear of This Building. "Loungers" Are Not Wanted.

lights attract the crowds, why not use them, figured Mr. Tilden. There is absolutely no reason why a lumber yard cannot be made attractive. So he set about to do it. And he has found it mighty good business to have a lumber and coal yard where merchandising efficiency is given careful thought, where the sheds are well planned and well built, well stocked with a well-balanced line of goods, carefully selected in relation to the needs of the community, and where the working force is well organized and successfully functioning. Today the Corn Belt Lumber & Coal Co. is a credit to the city.

The first consideration was arrangement ot site so as to obtain maximum efficiency in a minimum of space. Covering only a half block of ground, this lumber yard is small in comparison to many, but this is possible because only an average stock is carried and that stock placed in compact and orderly form. Frequent orders keep the stock on hand up to the needs of the customers; which affords a quick turnover. A plot layout is shown here.

The plant completed, Mr. Tilden started out to make it so attractive as to interest his community. He hired a skillful sign painter and put him to work. In a short time the bare, bleak facade of No. 4 shed (see plot plan) was transformed into a pretty picture—a pretty bungalow in a

Interior of Concrete Vault in Office Building Where Plans, Specifications and Other Records Are Stored. Systematic Handling of Business Has Been One of the Big Factors in the Phenomenal Success of This Lumber Company.



Shed No. 1. Another Close-up View Showing How Lumber Is Efficiently Arranged. Inventory Is Not a Discouraging Task in a Plant Like This. Dead Stock Is Soon Located. Rapid Turnover Is One of the Secrets of Success.

Shed No. 3. Note the Arrangement of Bins for Storage of Lumber. All Drives Are Concrete, Inside and Outside the Sheds, to Prevent Delay in Deliveries Frequently Caused by Muddy Driveways. Bad Weather Means Little in the Work of This Concern. Trucks Drive In and Out All Year Without Layoffs.

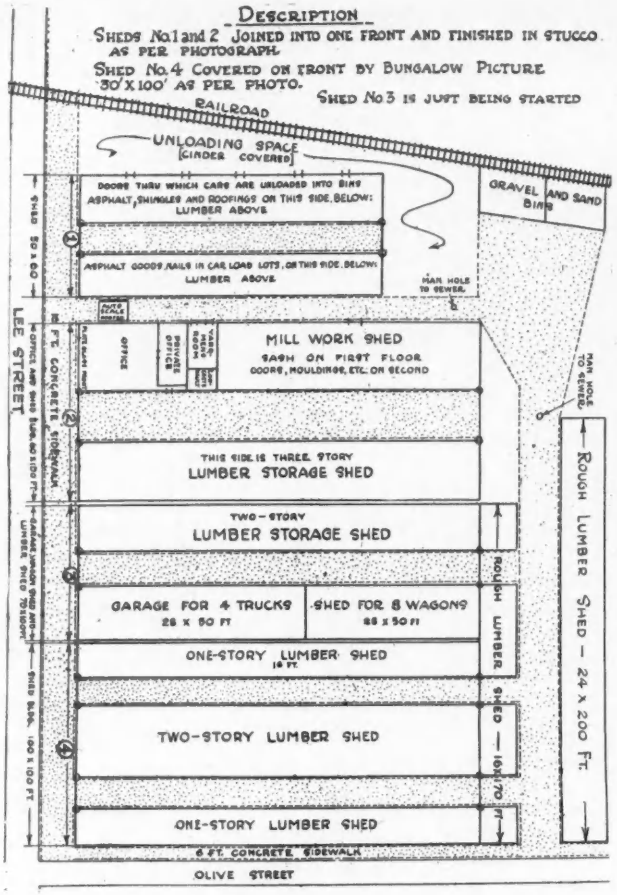
handsome setting of trees, fountains, summer house, etc. A reproduction of this picture was made on a slide and shown in the various moving picture theaters. Two sliding doors in this wall have special designs, one a fountain, the other a summer cottage; when closed they blend into the larger picture giving the appearance of a cottage and a large yard. On each end of the wall are signs:

"Why Pay Rent?—Own Your Own Home."

"112 Models to Choose From; Plans and Specifications Furnished Free."

The sliding doors can be left open without spoiling the general effect of the picture.

In No. 2 shed as indicated on the plan, the office is located. The most efficient systems of accounting and bookkeeping are used. All accounts are in the mail by noon of the first of every month. A trial balance is prepared every night and all bills payable posted each evening. Two accountants are kept busy. In a concrete vault at the rear of the office are stored all books, records, plans and specifications; the millwork is stored in the same building in which the office is located.




**Layout of Buildings and Yard of Corn Belt Lumber and Coal Company. All Stock Is Carried Under Roof. The Higher Grades Are in Enclosed Sheds and Cheaper Stuff in Open Sheds. Drain Tile Carries the Surplus Water from Rains Into a Trunk Sewer Nearby. Miscellaneous Building Materials Are Convenient to the Sidetrack.**

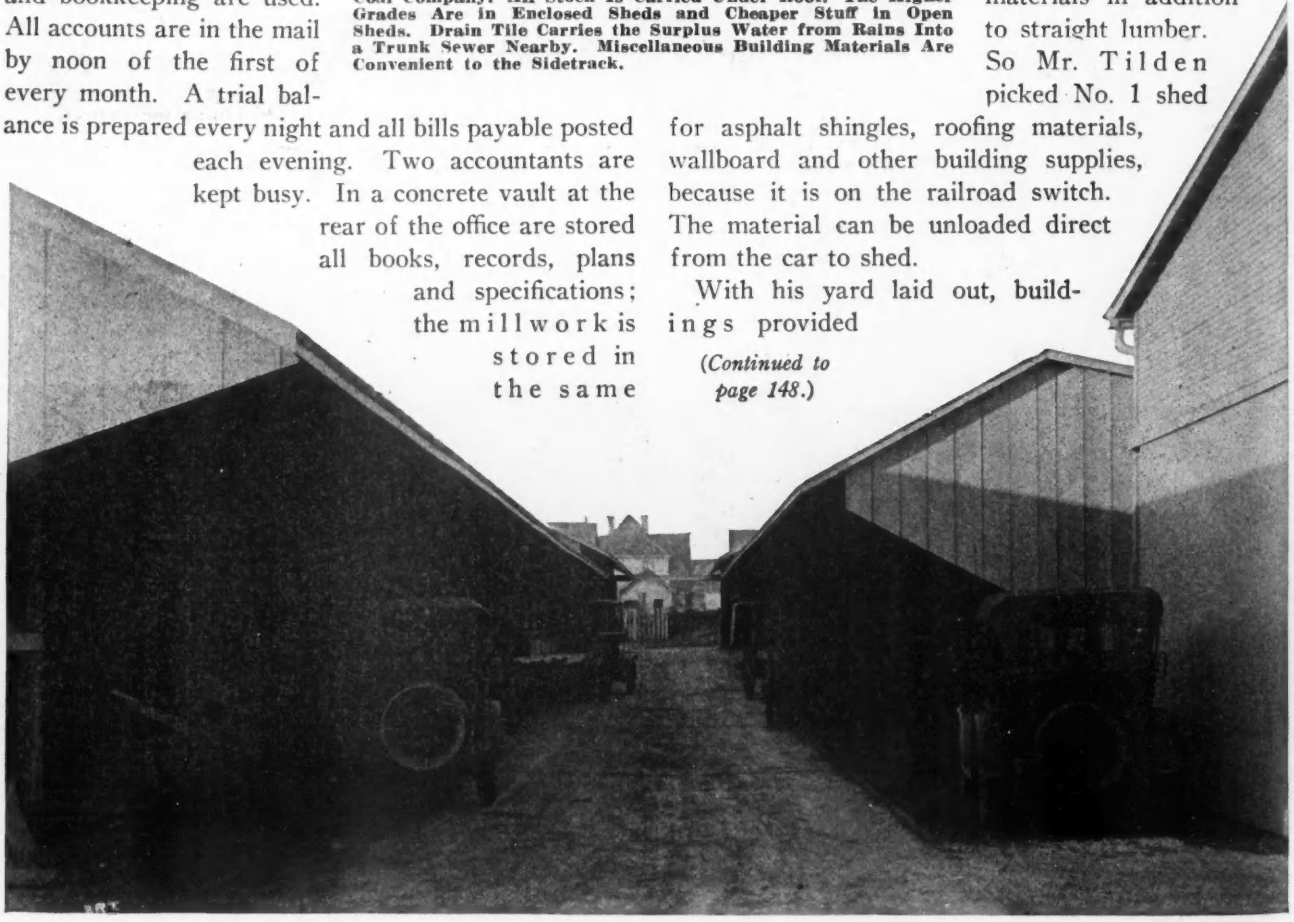
Now, to his plant in general. Mr. Tilden has profited by experience, by observation. Muddy driveways were not going to hold up deliveries and activity in his yard. So he had all roadways, both inside and outside the sheds, built of concrete. Bad weather means little in the work of the Corn Belt Lumber & Coal Co.

All stock is carried under roof. The higher grades are in enclosed sheds and cheaper stuff in open sheds. Drain tile carries the surplus water of rains from all parts of the yards to a trunk line sewer close at hand and the heaviest rains have caused no inconvenience.

This lumber yard carries an extensive line of materials in addition to straight lumber. So Mr. Tilden picked No. 1 shed for asphalt shingles, roofing materials, wallboard and other building supplies, because it is on the railroad switch. The material can be unloaded direct from the car to shed.

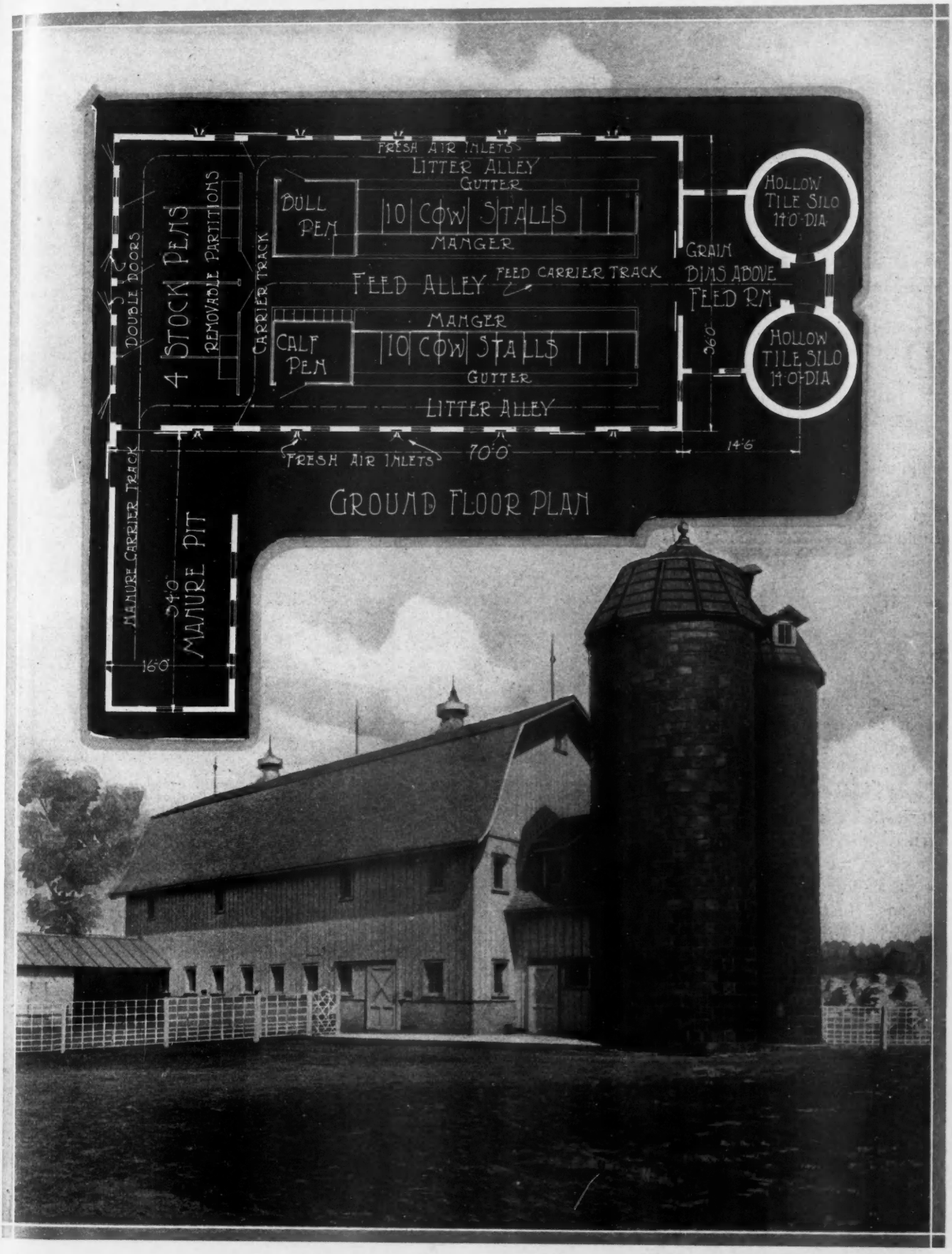
With his yard laid out, buildings provided

*(Continued to page 148.)*

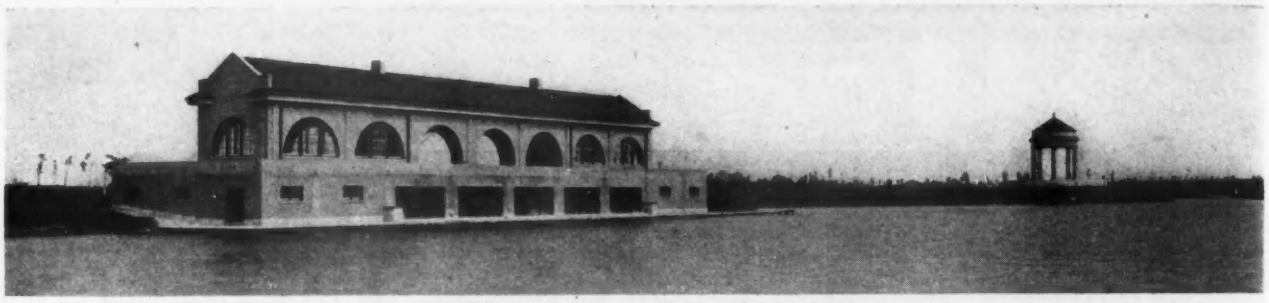


**Concrete Roadways and Open Sheds in Yard of Corn Belt Lumber and Coal Company. This Progressive Lumber Firm Operates Four Motor Trucks. Wagons Were Converted Into Vehicles and Double-Hauling Capacity.**

# Well-Designed Dairy Barn and Silos




**WELL DESIGNED DAIRY BARN WITH SUBSTSTANTIAL TILE SILOS.** This is the type of building progressive builders are constructing in farm communities today. Everything is of the latest design. Note the litter and feed carrying equipment indicated in the floor plans. A manure pit is immediately adjacent and connected by track. The two silos, 14 feet in diameter, are built of hollow tile and are next to the feed room, which is fitted with grain bins. The barn has twenty stalls, calf pen, bull pen, and a row of stock pens at the left end with removable partitions. All stall equipment is modern, sanitary, and humane. Drinking cups and mangers are an essential part of this equipment. This is the type of barn that is helping keep the boy on the farm. It is 70 feet long and 36 feet wide, while the manure pit or shed is 34 by 16 feet.



View of Boat House from the Lake at League Island Park, Philadelphia's Newest Garden Spot.

# Attractive Group of Park Buildings

**PHILADELPHIA'S NEWEST PARK HAS FOUR BEAUTIFUL BUILDINGS WITH DISTINCTIVE ARCHITECTURAL FEATURES**

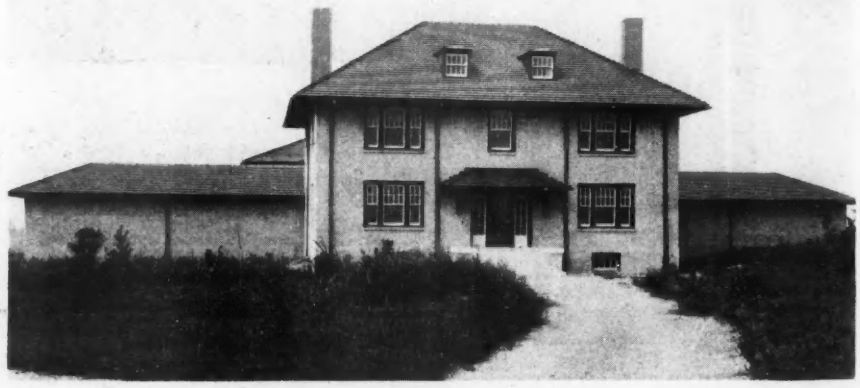
**By John F. McClarren**

PHILADELPHIA'S newest park, the League Island Park, has a group of exceptionally attractive buildings which have just been completed. As park buildings go they are attracting much attention among those interested in buildings of this kind.

The buildings are four in number and consist of the Administration Building, the Lookout, a Boat House and a Band Stand. The buildings were designed by Ralph E. White, a local architect, and cost, in the aggregate, about $250,000. Originally a fifth building to serve as a pavilion was also to have been constructed, but the building of it has been deferred for the present.

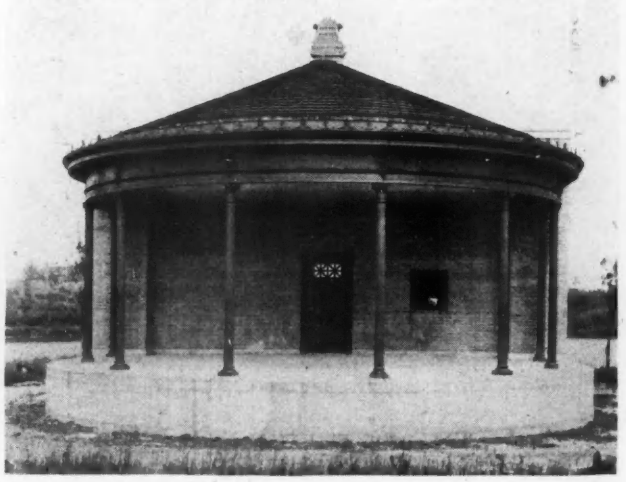
As to the Administration Building it is of a very attractive design, two stories with an attic. It is constructed of gray brick with a roof of red tile. Immediately in the rear and extending beyond either side of the building are sheds for the storage of tools and wagons. Just across from this tool and wagon yard, somewhat further in the rear of the administration building, is a two-story stable. It will accommodate eight horses. The stable is two stories in height, constructed of glazed brick with a roof of red tile.

The boat house is one of the prettiest of the buildings. It is on the shore of a beautiful lake. The structure is of buff brick with limestone cornices and trimmings. The main entrance is from a roadway, this entrance being reached by great wide steps of granite. The section of the boat house on a level with the lake



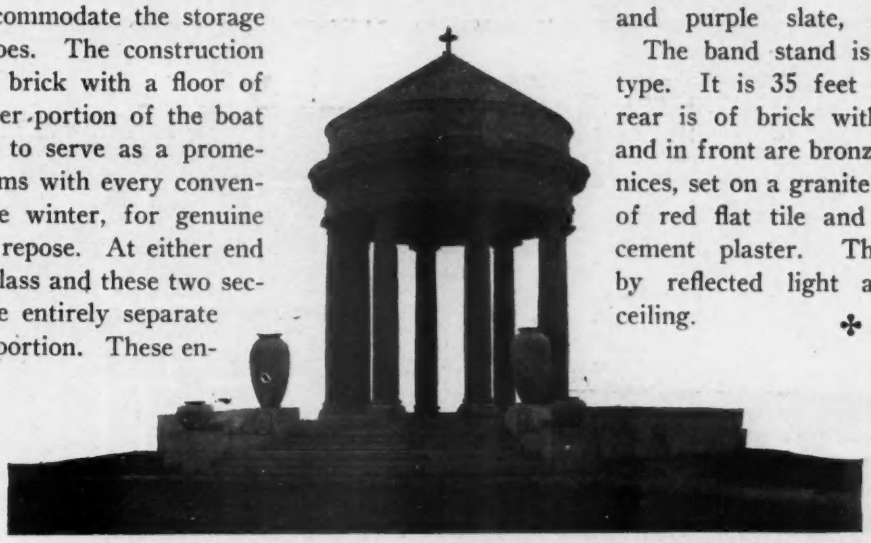
Front View of Administration Building, One of the Five New Buildings Which Have Been Erected in League Island Park. It Is Gray Brick with Roof of Red Tile. The Low Wings Are Sheds for Tools and Wagons.

Rear View of Bandstand. Note Entrance. This Stand Is of the Semi-Open Type and 35 Feet in Diameter. The Rear Wall Is Brick with Stone Trimmings. A Stone Lyre Surmounts the Structure.



Front View of Bandstand. The Roof Is Supported by Bronze Pillars Set in a Granite Base. The Cornice Is Also Bronze. The Roof Is Red Flat Tile and the Ceiling Cement Plaster. Illumination Is Furnished by Reflected Lights Around the Ceiling.

is designed to accommodate the storage of boats and canoes. The construction here is of glazed brick with a floor of cement. The upper portion of the boat house is designed to serve as a promenade and rest rooms with every convenience, even in the winter, for genuine comfort, rest and repose. At either end it is enclosed by glass and these two sections can be made entirely separate from the opening portion. These enclosed sections are for use in cool or inclement weather. The entire building is 65 feet in width and 185 feet in length.



**The Lookout. Smallest but Most Pleasing Building of Group. It Stands Close to the Lake and Is 25 Feet in Diameter and 35 Feet High. The Columns and Cornices Are Limestone and Roof Is Red Tile. The Inside of the Dome Is Pale Blue Glazed Tile. It Is Surrounded by a Walk 50 Feet Wide.**

Comparatively the smallest of the buildings is the Lookout, but is most pleasing to the eye. It stands close to the lake but a short distance from the boat house. The Lookout is 25 feet in diameter and 35 feet high. It is surmounted by a bronze ornament. The columns and cornices are of limestone and the roof is of red tile. The inside of the dome is of pale blue glazed tile. The promenade around the Lookout has a diameter of 50 feet. The wall and coping is of white granite. The steps are also of granite, ornamented by check blocks. The floor of the structure as well as that of the promenade is of variegated green and purple slate, laid to patterns.

The band stand is of the semi-open type. It is 35 feet in diameter. The rear is of brick with stone trimmings and in front are bronze columns and cornices, set on a granite base. The roof is of red flat tile and the ceiling is of cement plaster. The illumination is by reflected light around the entire ceiling.

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### Thirty Carpenters Take Course in Architecture

THIRTY carpenters, many of them gray haired, poring over their drawings and vying with one another in their work, are the members of a class held every Friday evening by Professor Percy P. Adams, of the architectural department of the University of Oregon.

This class, which is composed largely of members from the carpenters' union in Eugene, is an extension class, organized at the request of the men, who asked that they might be permitted to study under the direction of the University some of the things they missed earlier. Professor Adams is giving two courses, Graphic Statics and Estimating, and most of the men are taking both.

# Metal Millwork in Residential Construction

**STEEL AND METAL SASH AND FRAMES ARE NOW BEING USED IN RESIDENCES AND SMALLER BUILDINGS —DETAILS IN BLUEPRINT ON PAGE 115**

STEEL daylight sash has long since been accepted as the logical window construction for factories. With the increasing demand for fire protection in the smaller buildings and homes, solid steel or hollow metal sash has become an important factor in this construction. Standardized in size and type like wooden sash and frames, it is carried in stock by many lumber dealers and building material dealers ready to be furnished upon specification.

It has come to be considered a logical companion to the recently introduced steel lumber now being used for joist and partition work in residential construction. Because of its variety of type it can be specified for all kinds of building.

Metal sash and frames are made in all the familiar forms. The standard pivoted window may have either one or both sash pivoted. In one type the lower sash is stationary, being built as part of the lower frame. The upper sash is pivoted and is so arranged that it can be revolved for cleaning. This sash is so hung that about 60 per cent of the weight is below the point of revolution. When open it is held in place by a chain or other device.

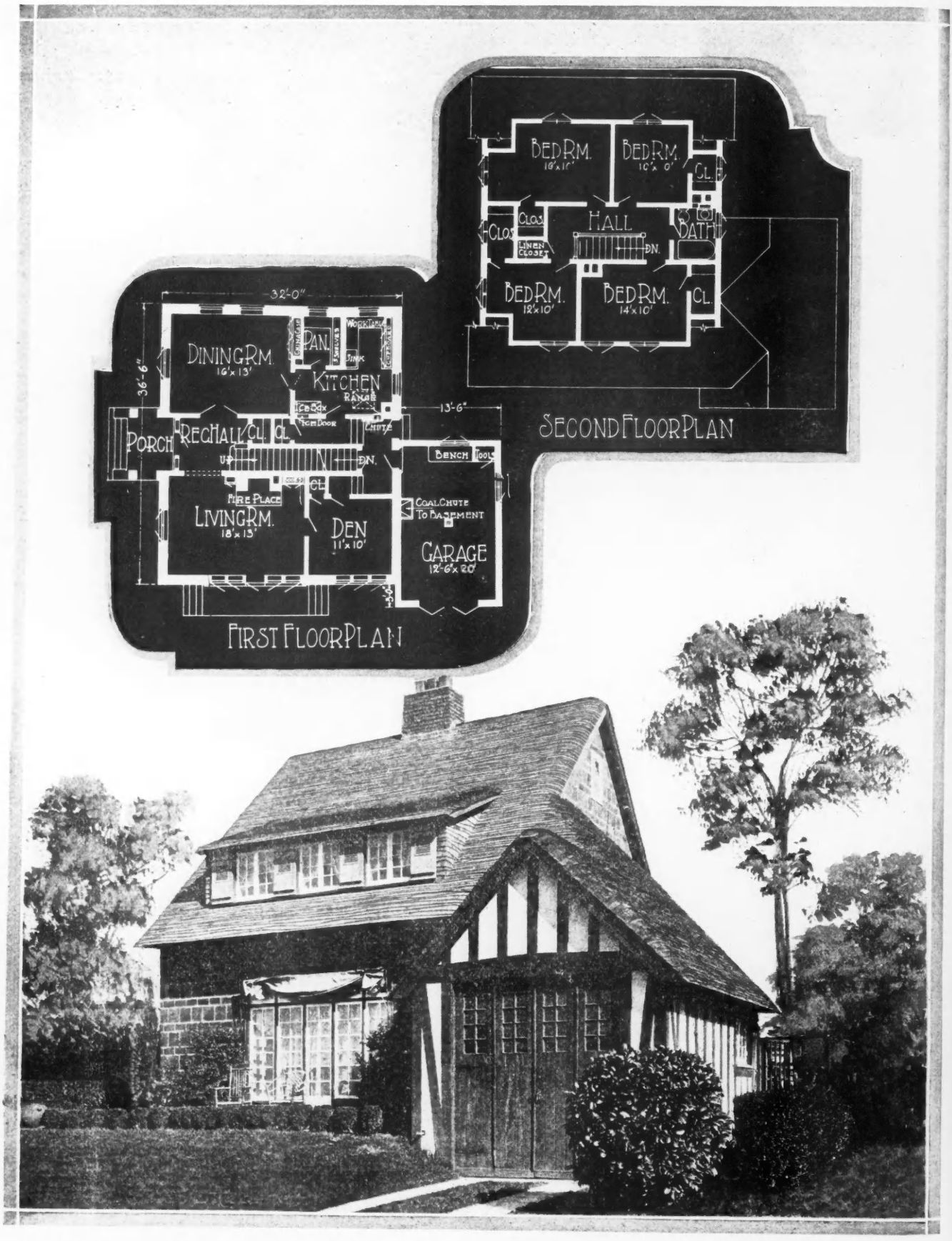
Other types of metal windows are the double hung, used in homes, top hinged, and pivoted for basement windows, as shown in the detail sheet on page 115, stationary, casement, and multiplies forming any combination desired. This type of metal window is particularly effective in casement windows, of which several are now available.

The stationary sash is used in factories, public garages, warehouses, etc., where it is necessary to have window openings permanently closed to keep out dust, dampness or draughts; also where fire regulations call for fireproof materials wherever possible. The counterbalanced sash is a type used extensively in office buildings and in many homes. Both sashes move in opposite directions at the same time, providing ventilation at top and bottom.

The double hung and reversible type, as it is often called, are the most common types in use. There can be one, two, four, or six panes to the sash.

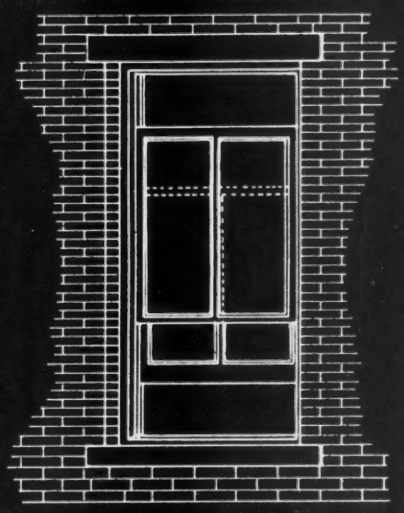
The metal sash and frame idea is not entirely new, as this form of window construction has been in use in some European countries for nearly 100 years and is still being fabricated there in large quantities.

# Uniquely Designed Home with Metal Sash and Frames Details

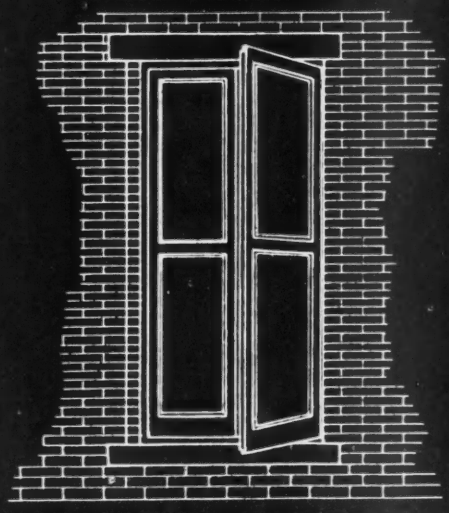



CHARMING HOME OF UNIQUE DESIGN. There are several features about this pleasing little home that help to make it distinctive and different. There is the hollow tile exterior, thatched roof, and built-in garage with its tall doors and half timber effect walls of stucco. The casement windows and French doors are also very attractive—in this home they are metal, similar to those shown in detail on the opposite page. The entrance to the house is on the left side. It opens into a reception room which is located between the living and dining rooms. The living room is large, well-lighted, with an open fireplace in the inside wall. A small den adjoins it. The kitchen is very completely equipped. Upstairs are four comfortable, cheerful bedrooms with ample closet room. The garage is 12 feet 6 inches by 20 feet. The house is 36 by 32 feet.

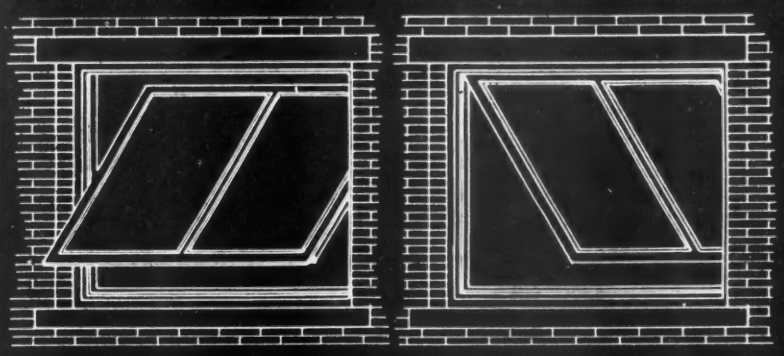
# RECOMMENDED CONSTRUCTION



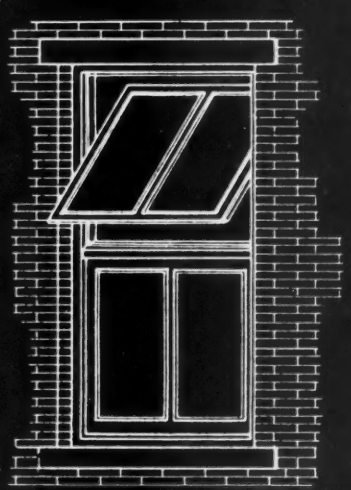
DOUBLE HUNG METAL SASH



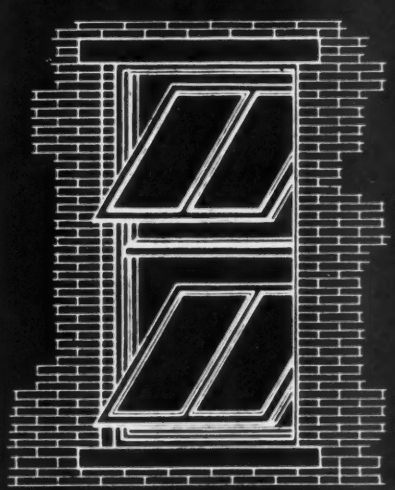
CASEMENT METAL SASH



PIVOT HUNG & HINGED METAL BASEMENT SASH



PIVOTED METAL SASH



DOUBLE PIVOTED METAL SASH

## METAL SASH & FRAMES FOR RESIDENCES

# Attractive Two-Story House of Concrete Block

**SWISS-STYLE RESIDENCE CONTAINS NEW, LARGE, WELL-ARRANGED ROOMS AND MANY UNUSUAL FEATURES**

**By A. J. R. Curtis**

THE two-story suburban residence shown in the accompanying illustrations, designed by Dean & Dean, architects of Chicago, contains many attractive and some unusual features.

There are nine rooms, all large and well arranged. The porches are semi-enclosed. The entry and hallway are conveniently arranged and have large coat closet. Opposite the stairs is a large open arch into the living room. Two more archways give unobstructed view into the sun room and dining room. At the end of the reception hall is a doorway leading to the cellarway and grade entrance, and to a small

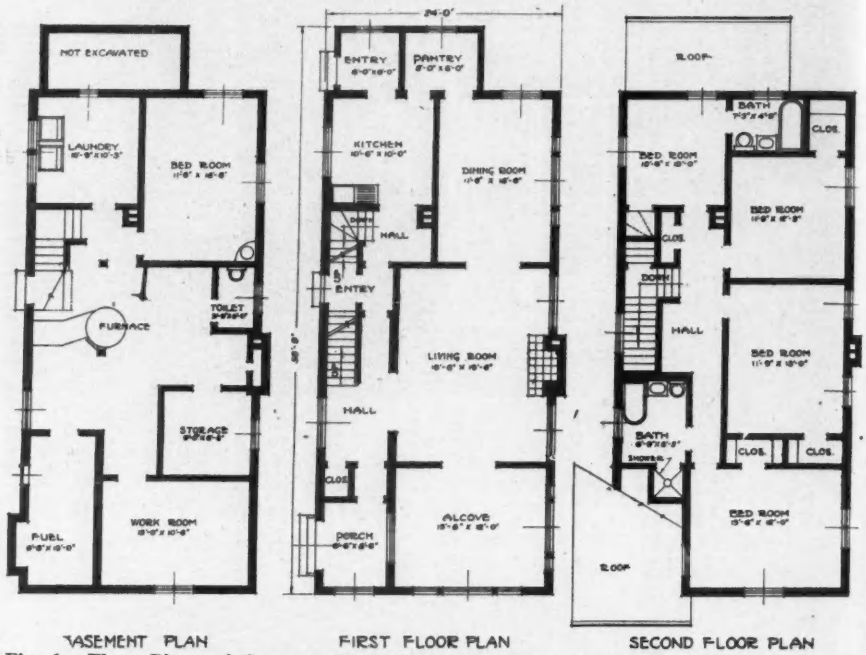



**Fig. 1. Floor Plans of Concrete Block House Described in the Accompanying Article, Designed by Dean & Dean, Architects, Chicago.**

**Fig. 2. Entry Detail, Swiss-Type House, Showing Rough Block Texture and Irregular Flush Joints Used to Accentuate the Rustic Effect.**

rear hall from which the rear stairs ascend.

Service to the dining room is thru a large serving pantry. Rear entry to kitchen is well located and has convenient space provided for refrigerator with drain. If desired, a kitchen refrigerator can be used, icing from the rear entry.

The second floor has four bedrooms, three of which have closets; the rear bedroom has attached bath and reached directly by the rear stairway being intended for occupancy by maid or other servant.

The general bathroom is large and contains both tub and shower baths. Ample space for the linens is provided in a large closet in the upper hall. One bedroom, toilet, laundry, workroom, fruit and vegetable storage, fuel room and heating plant occupy the basement. The plans contemplate the use of a hot air furnace heating plant.

Foundation is of concrete construction poured in place and the walls are of concrete block 24

**Fig. 3. Front Elevation of Swiss-Type, Two-Story House. Notice How Well the Architecture Conforms to the Wooded Location.**

inches long and 7 inches in height. The block are made entirely of a graded mixture of cement, sand and pebbles, no special facing being used. This surface was selected to give a rustic appearance in keeping with the general lines of the house and the wooded location. The mortar joints were made flush and left rather irregular to add further to the rustic effect. Sills and lintels are of precast concrete. The floors and stairs are of the usual type frame construction. The roof is of green cement tile of the shingle type, laid on a wooden frame. The interior plaster is on wood lath, except the ceilings, which, for greater fire protection, are of cement mortar on metal lath.

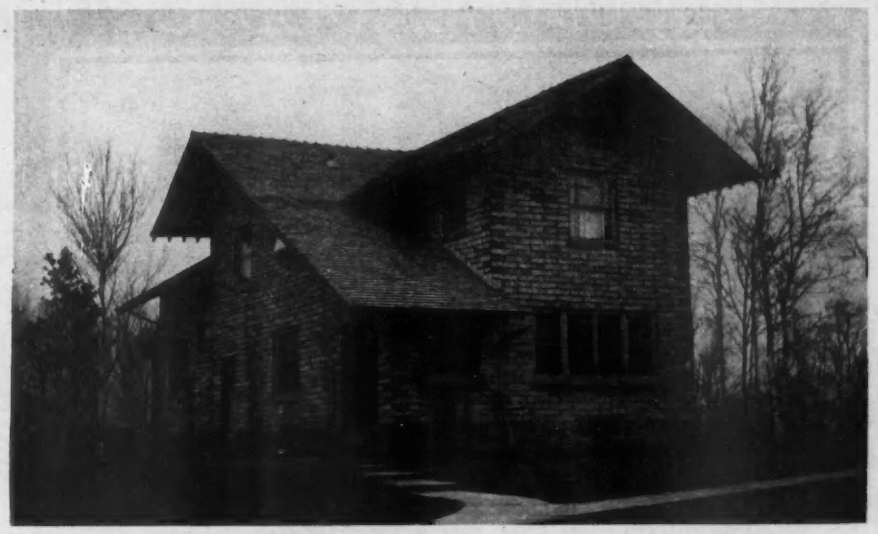


Fig. 4. Front and Side Elevation House Illustrated in Fig. 1, Showing the Long and Rather Unique Lines of the Roof.

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### Action of Quick Lime Similar to Dynamite for Breaking Up Masonry

TO break up an old stone wall or other masonry, or to knock out a superfluous brick pier without the use of dynamite, slow hand labor is unnecessary. Simply drill a good-sized hole in the wall—making this bottle shaped with as small an opening as possible. Put in quick lime until this hole is almost full and make a tight-fitting wooden plug that can be driven firmly into the opening. Quickly pour in enough water to slake the lime and then drive home the plug.

The expansion of the lime as it slakes will exert a tremendous pressure that will easily break up any ordinary piece of masonry.

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# Laying Rubber Tile Flooring

SOFT FLOORING VERY POPULAR IN PUBLIC BUILDINGS AND NOW BEING USED IN PRIVATE HOMES—DETAILS ON PAGE 118

RUBBER TILE can be laid on any existing floor, wood, stone, iron or cement, the surface of which must be smooth. The tiling is ⅜ inch thick. Provision must be made on all sides for tiling to lock up against wall or base and all openings should have threshold or brass strips ⅜ inch higher than the bed to receive the tile.

A special cement is used similar to glue except that it is waterproof and sets very hard after forty-eight hours. One gallon of cement will usually cover about 100 square feet, as only a thin layer is required.

A cutter similar to a tobacco cutter is generally used for cutting the tile. The only other tools required are a hammer, trowel, and sharp knife.

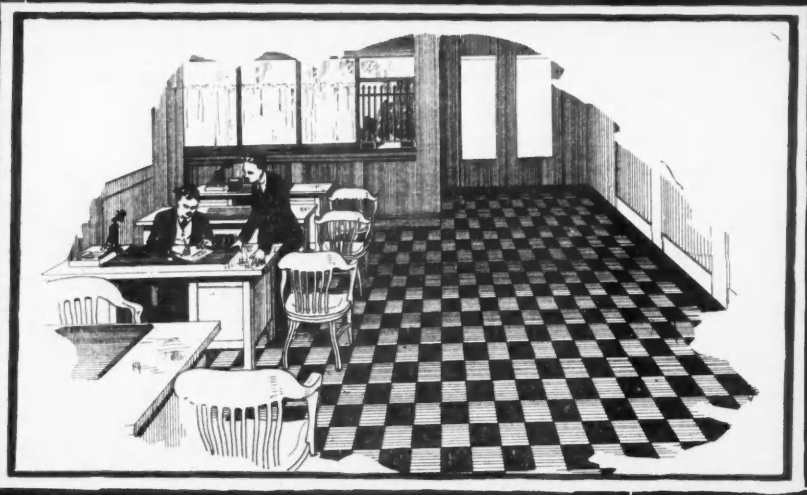
The space to be covered should be centered and squared up. If design is not complicated it will not be necessary to start in the center, as multiples of tile can be figured out and the width of the last row on outside border can be established so that the laying of the tile can start at any corner. Quite often the tile is laid out on the floor before applying the special cement in order to establish the width of outside border tile. A few tile, the exact width required, can be then cut as guides, a few of each to be used on all sides, as the field must be entirely covered before the last outside row of tile, which, unless it comes exactly full tile, must be cut to fit.

The floor now being smooth and clean, pour out a small quantity of cement, spreading it with a trowel over a space two or three feet wide. A few outside tile guides are then placed at the starting corner. Proceed to lay the tiling, using a hammer to lock the joints together. Usually the interlocking tile is shipped in slabs 6 by 6 or 8 by 8. The entire field is then covered after the outside row of tile is cut to fit.

Each tiling being buffed, the work is then complete and can be used immediately. Care should be taken, however, in regard to water being placed on the floor for a few days until the cement has thoroly set and the tile expanded, closing up all the cracks and making the floor waterproof. Gasoline or benzine, being solvents of rubber, can be used cautiously with emery paper in extreme cases for rubbing down or smoothing any uneven places. It will be a matter of a little wear and several scrubbings before the rubber tile colors really show as they should.

Ruber tiling is used very extensively in bank buildings, bathrooms, libraries, hospitals, kitchens, and homes.

# RECOMMENDED CONSTRUCTION



## RUBBER TILE FLOORING

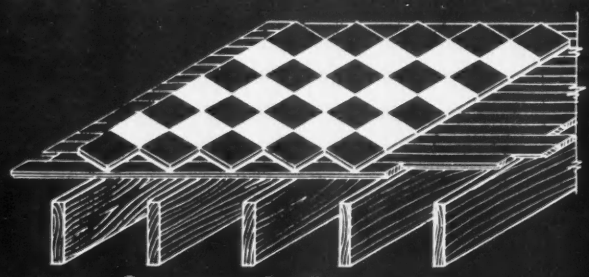
CAN BE LAID ON ANY EXISTING FLOORS SUCH AS WOOD, STONE, CONCRETE AND IRON.

IT IS EXTENSIVELY USED IN PUBLIC BUILDINGS AS WELL AS IN RESIDENCES, IN KITCHEN, PANTRY, HALL AND BATH ROOMS.

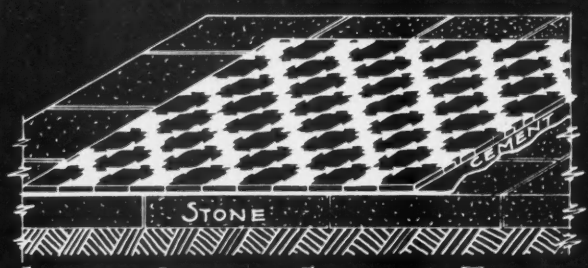
THE SQUARE TILES ARE MADE UP IN 6" SQUARES 3/8" THICK AND THE INTERLOCKING TILE IS 2 3/8" SQUARE AND 3/8" THICK.

THE TILE IS LAID AND FASTENED IN PLACE WITH SPECIALLY PREPARED WATER PROOF CEMENT.

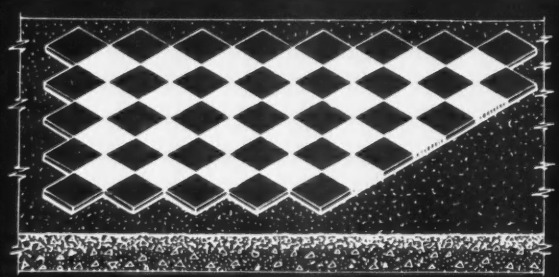
SOME OF THE COLORS MOSTLY USED ARE RED, WHITE, BLACK, BLUE, GRAY, GREEN, BUFF, SALMON AND CHOCOLATE



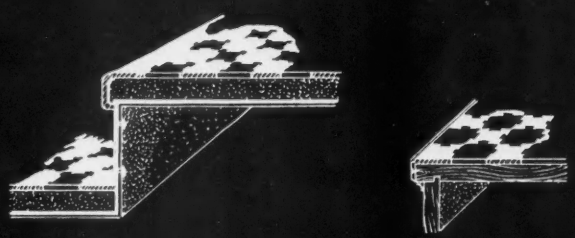
LAID OVER WOOD FLOOR



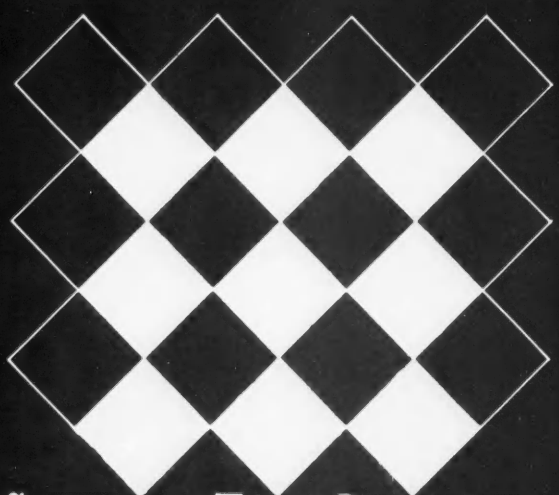

LAID OVER STONE FLOOR



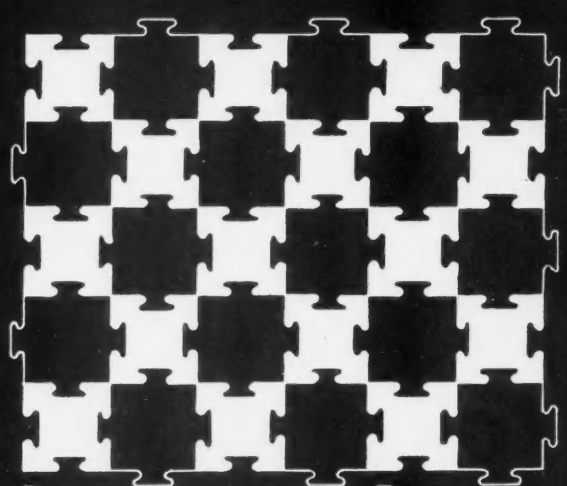
LAID OVER CONCRETE



LAID ON STAIR TREADS

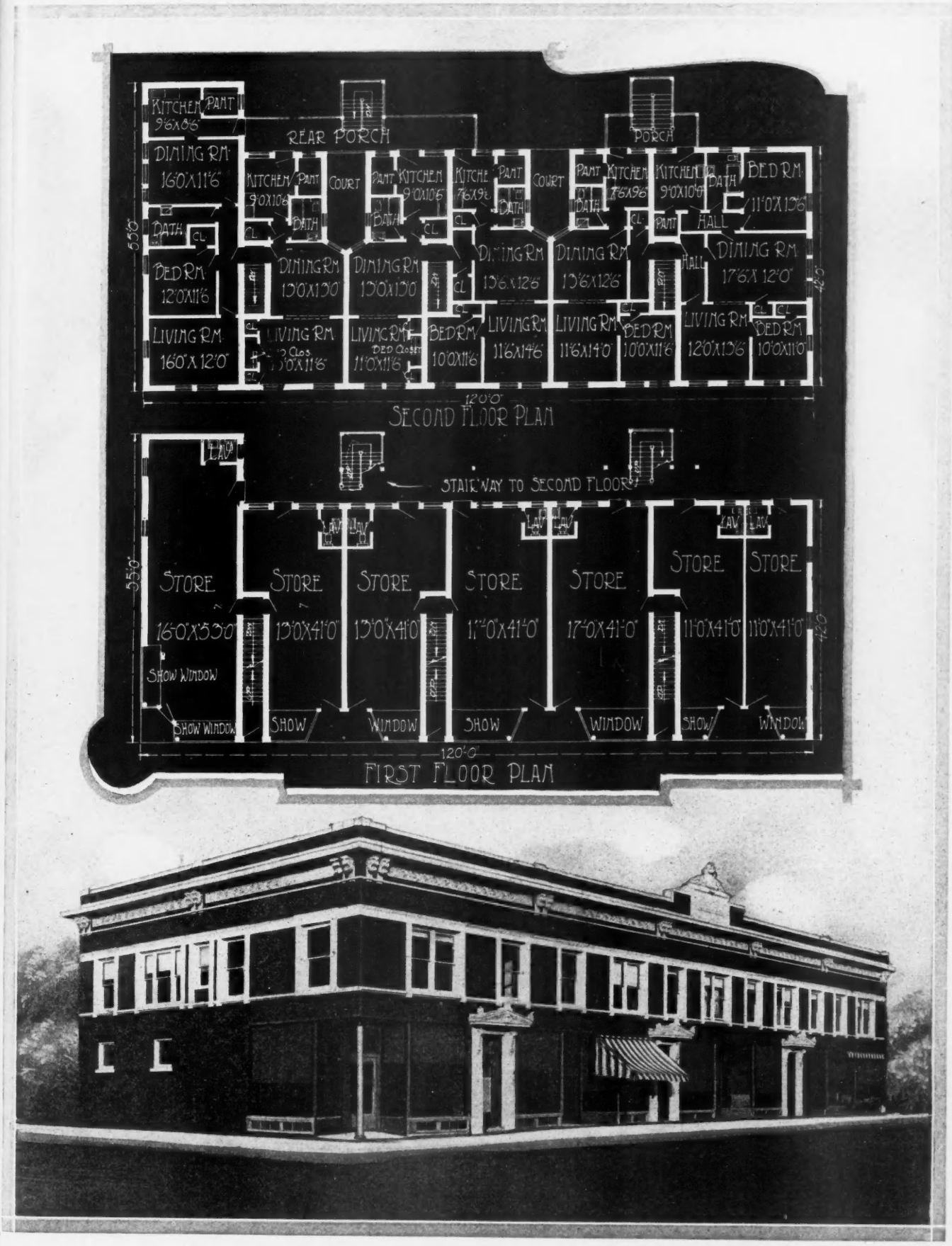


SQUARE TILE DESIGN



INTERLOCKING DESIGN

# RUBBER TILE FLOORING




**EFFICIENT CORNER LOT STORE AND APARTMENT BUILDING.** This exemplifies an excellent handling of the corner lot building problem to gain maximum results. On a site 42 by 120 feet, the contractor has erected a building containing seven stores on the first floor and six modern apartments upstairs. The income feature of such a layout is apparent. The building is of brick with attractive terra cotta trim, all store fronts of the latest types. The corner store is the largest, 16 by 53 feet, the others being 41 feet deep and ranging from 11 to 17 feet in width. The apartments contain three, four, and five rooms. Plenty of window space is provided along the front and side walls and courts in the rear of the building. The floors of the stores are rubber tile, details of which are shown on the opposite page.

# Small City Builds Modern High School

LARGE ASSEMBLY HALL AND GYMNASIUM FEATURES OF WOOD RIVER, ILL., INSTITUTION

**By Herbert C. Crocker**

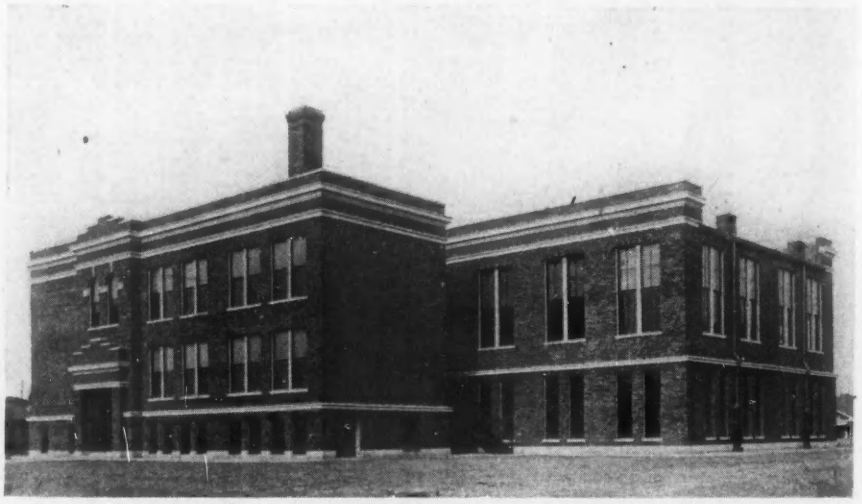
ONE of the finest specimens of high schools built in the Mississippi Valley during the past several years was completed during September at Wood River, Ill., a city with an increase of 4,038 per cent in population during the past ten years according to the Census Bureau and said to be the most phemonenal of any city in the United States. It is this unusual growth that forced Wood River to provide the school facilities altho two other large high school buildings had been erected but outgrown.

Altho constructed under the present high charges for materials and labor the buildings complete cost only $127,866. On this work bricklayers and carpenters were paid $1 an hour. Plasterers received $10 a day and common labor received from $5 to $6 for eight hours.

The structure proper cost $92,600. The heating contract amounted to $25,081 and plumbing cost $10,185. The grading cost approximately $2,500 while equipment and other incidentals added about $8,000 to the cost.

The building was designed by J. W. Kennedy, architect, at East St. Louis, Ill. So far as Illinois laws are concerned in regard to the lighting, ventilation, heating, sanitation and other requirements, this school is up to the minute and will be considered as a standard structure for years in every respect unless very radical new requirements are made.

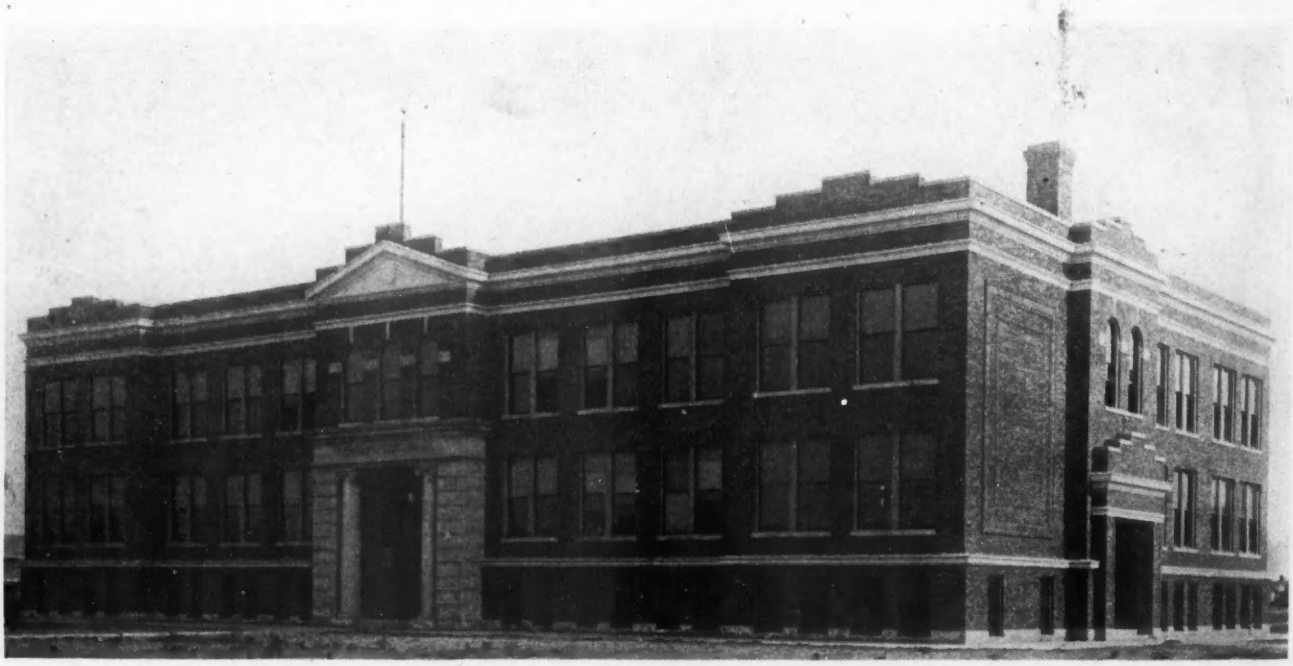
The heating system is a low pressure steam outfit with two boilers. The heat regulation is such that the temperature of any room is easily controlled. The gravity system of ventilation was installed, the radiators being located in the fresh air flues—a requirement of the state law.



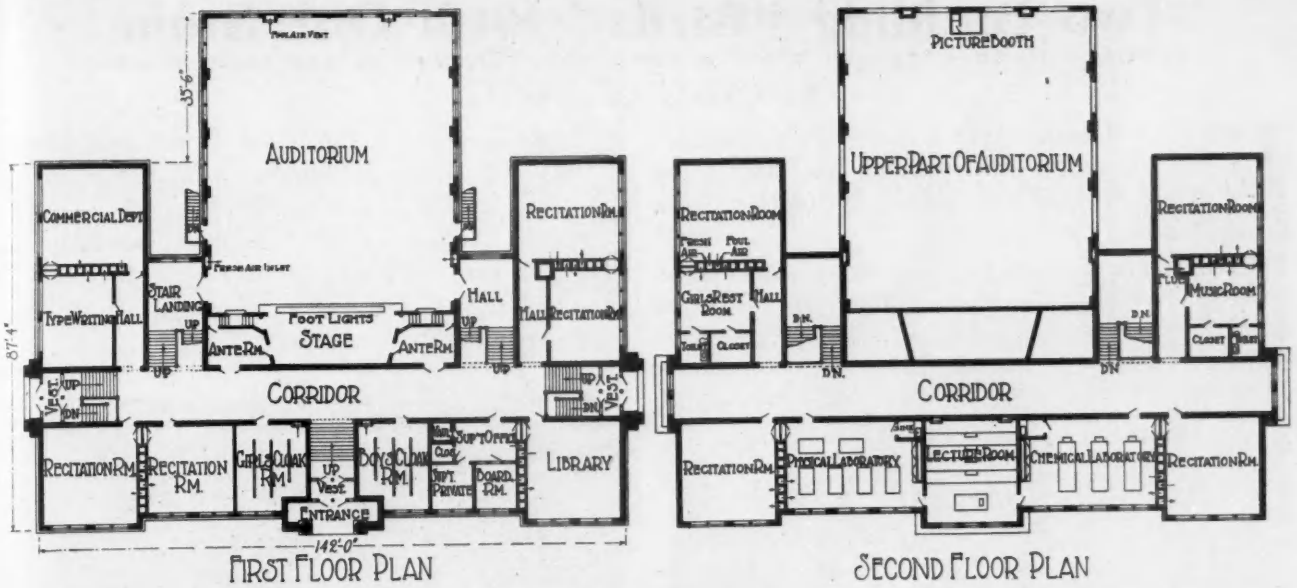
View of Wings and Auditorium of New High School. Wood River, Ill., Outgrew Two High Schools in Less than Ten Years. Special Attention Has Been Directed to Lighting and Interior Decoration. The Auditorium Has a Capacity of 350.

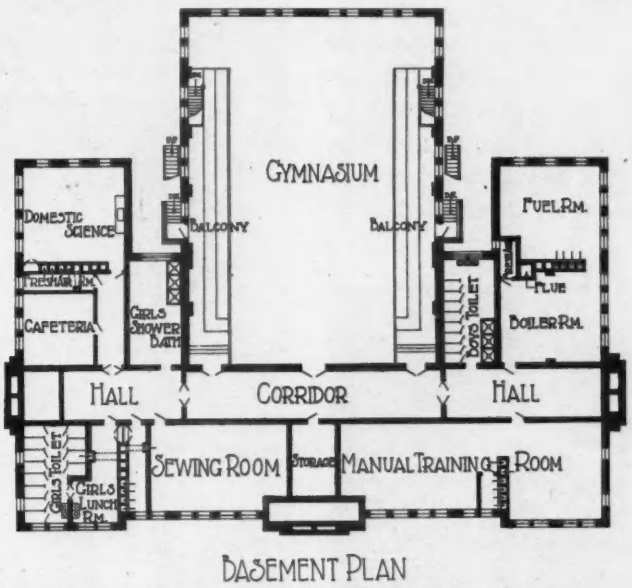
The school is laid off in three wings, with corridors and other space across the front portion of the structure. The main wing is utilized for a spacious gymnasium and auditorium. The wings on either side are smaller and divided for class rooms as well as other purposes.

The institution is as near fireproof as possible for



Wood River High School, an Example of the Latest Developments in School Building. Designed by J. W. Kennedy, Architect, East St. Louis, Mo. It Contains Gymnasium and Auditorium and Complete Heating and Ventilating System. It has a Frontage of 142 Feet and Cost $127,000. The Walls Are Hollow Tile with Face Brick Finish.




**Basement and Upper Floor Plans of New High School Building Showing Modern Equipment and Efficient Arrangement of Various Rooms and Halls. All Corridors Are 12 Feet Wide and There Are Fire Escapes on Each Side of the Assembly Hall.**

a school to be. Hollow tile for backing up with a good grade of face brick are used in the walls To a great extent the floors are of concrete and the portions that are of wood are protected as much as possible from fire hazards. Even in case of a fire, progress of the flames would be so slow that lives of children would not be endangered and the damage would be a trivial matter.

The lighting of the rooms by day, as well as the electrical arrangement, was carefully worked out to secure the best effects possible. Soft tints were used in the decoration of the interior. Electric lights ranging from 100 to 400 watts were used.

The auditorium has a seating capacity for 350 children without the least crowding. About 1,000 may be seated for entertainments.

Altho considered a basement the lower floor is well above ground and space is used for a number of purposes. The gymnasium is 60 by 83 feet, and amply large for the sports of girls and boys. There are no supports that will interfere with their games. The ceiling is 18 feet high, assuring ample ventilation.

One wing of the basement is given over entirely for use of the girls. The domestic science rooms, fresh air rooms and cafeteria are conveniently arranged. Altho other lunch rooms are provided meals may be served in the cafeteria when desired. The girls' toilet and a shower for them are located in the same section of the building.

In the other lower wing are located two manual training rooms, the boys' toilet, the boiler room and storage space for coal.

Across the front are several rooms. One section is used for the sewing classes and the opposite end for manual training purposes. The portion between the two has been designed for storage of school supplies.

The auditorium or assembly room also has an 18-foot ceiling. It also is 60 by 83 feet with a stage at one end. The stage is 14 by 32 feet, quite large enough for the average literary program or play given by the average school.

The school superintendent has a public and private office on the second floor. His office is equipped with a vault for valuable records and other means of filing school property. The office of the board of education adjoins the superintendent's office.

The commercial department, a room for the typewriting classes, the library and two cloak rooms are on the second floor.

Besides the four recitation rooms on the upper floor, there is one lecture room, a physical labratory, a chemical labratory and music room. A girls' rest room is located on the same floor.

Without the least anticipation of a fire precautions were taken for ample avenues of escape in case of a disaster. The corridors are 12 feet wide and there are firescapes on each side of the assembly room. It is believed the building may be cleared of children in any emergency in about one minute.

# Two Building "Birds" With One Stone

LIMITED BUILDING SPACE AND HEAVY BUILDING COSTS OVERCOME BY NEW BUILT-IN GARAGE

By Chesla C. Sherlock

LIMITED building space is one thing; a slender purse, is still another. Either one may be the means of solving a perplexing problem in a happy fashion.

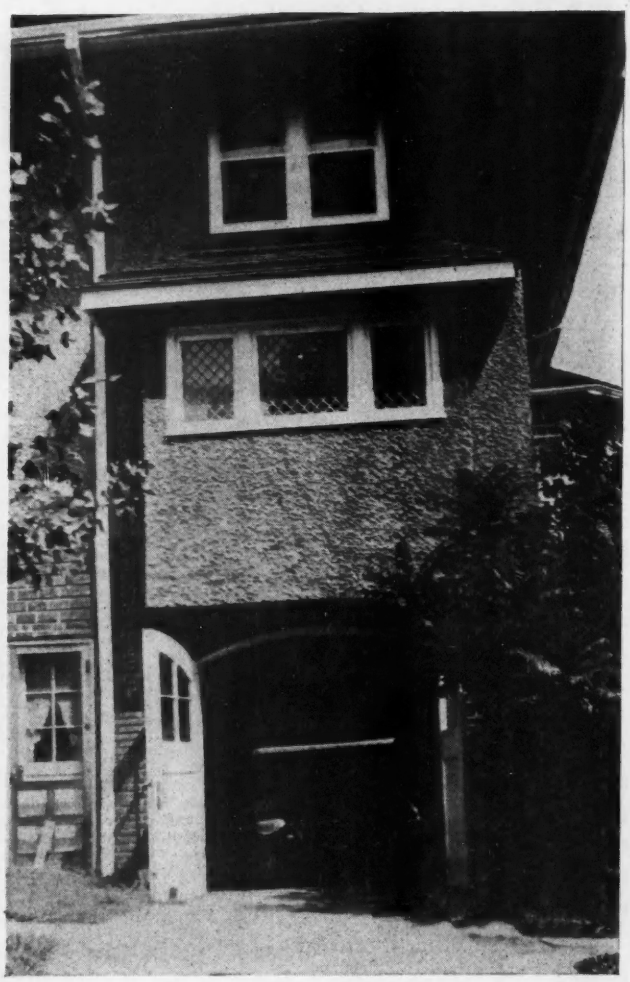
The very first problem confronting the home builder nowadays with a small lot on which to erect his dream mansion, is how to squeeze in the house and still have room for a garage and a space large enough for grass and flowers. If this isn't what confronts the builder, you will find him sighing reluctantly, and saying:

"We'll have to pass up the garage this year. It costs too darned much to build."

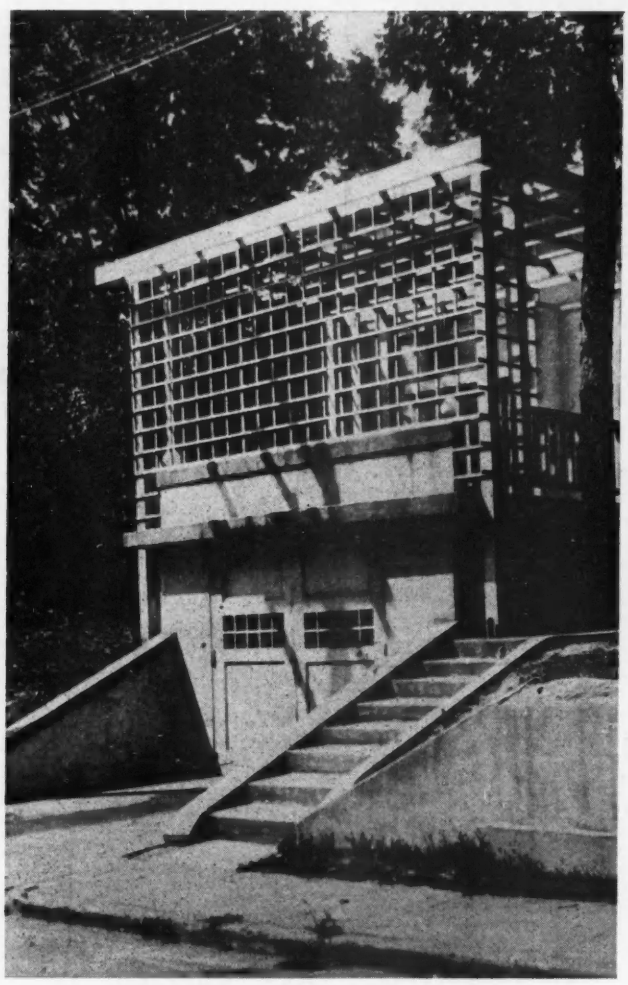
The solution, of course, is the "built-in" garage.

It is not only an economizer of space; it is a distinct addition to driving comfort—winter comfort. Not only that, but it adds to the life of any car to quarter it in a warm garage in cold weather. Many motorists have found that they can go all winter without radiator solutions with only the added protection of a hood cover. That means greater driving comfort with the biggest bugaboo of winter driving removed.

Adapting the built-in garage to your own building requirements is not so hard as it would seem. It can be done with an eye to beauty as well as to utility. It can carry out the general architectural scheme, either in the cozy bungalow, or in the pretentions two-story home. It can add a touch of novelty to the place, as in the case of the illustration showing a private semi-roof garden built over the garage.



**Side Hill Solution. How One Builder Solved the Garage Problem for His Client. The Built-in Garage Is Becoming Quite Popular Because of Its Convenience and Efficiency. The Builder Found Plenty of Room Under the Kitchen Without Excavating a Shovelfull.**

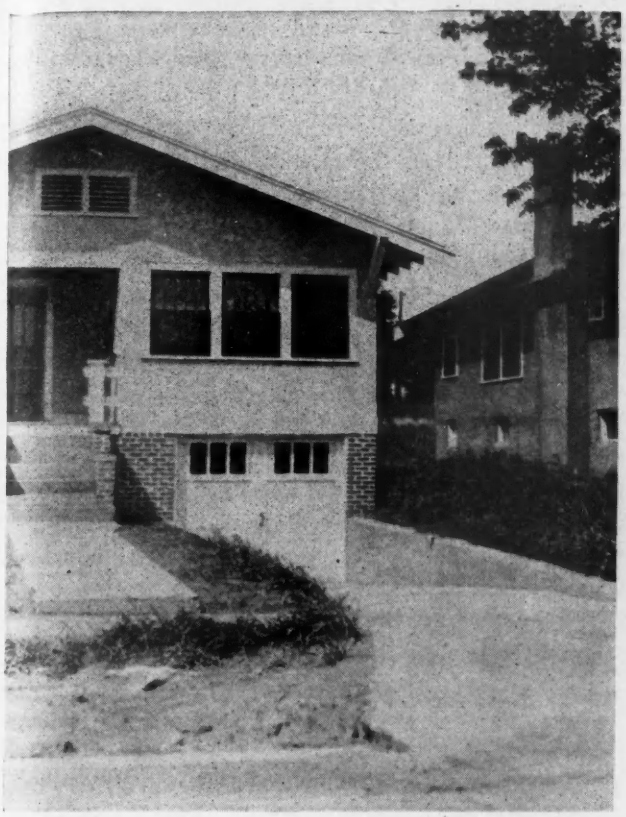


**Roof Garden Effect. Here the Builder Erected a Garage Adjoining the House and Facing the Side Street. He Used the Top of the Garage for a Porch and the Pergola Gives the Roof Garden Touch.**

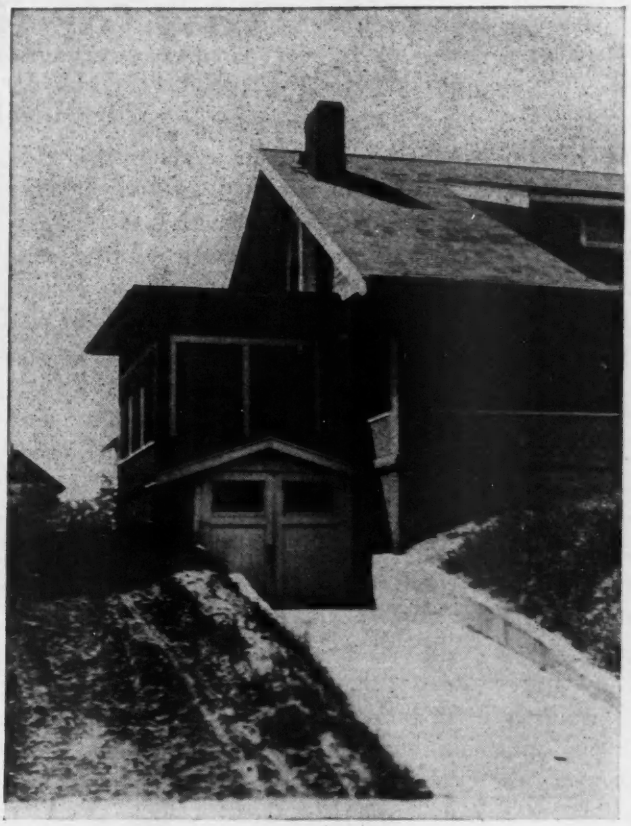
The corner lot offers abundant possibilities. It is perhaps better adapted to a number of solutions, and it will conform nicely to any conditions that may be peculiar in the builder's case. Three different corner lot suggestions are offered in the accompanying illustrations.

The first is the roof-garden type. Here the owner built his garage adjoining the house and facing the side street. He uses the top of the garage for a porch and the pergola on the end gives it the roof garden effect.

Another solution is shown in the large bungalow, where the garage is at the rear of the house, but a



Little Excavation Was Required to Make This Drive. The Owner Has a Garage in the Basement, an Excellent Shelter for His Car in the Cold Months. These Built-in Garages Add to Driving Comfort.



How a Terrace Lot Can be Used Very Satisfactorily to Take Care of the Garage. A Built-in Garage Cuts Down Paving Costs, an Important Item in These Days of Expensive Paving.

small curved drive connects it to the side street. The space over this garage is utilized as a solarium.

Still another corner lot idea is shown in the two-story brick residence; here the winding drive is again used with telling effect, and leading up to the side street so that the front lawn will not be needlessly cut up. A solarium and a sleeping porch are both above this garage.

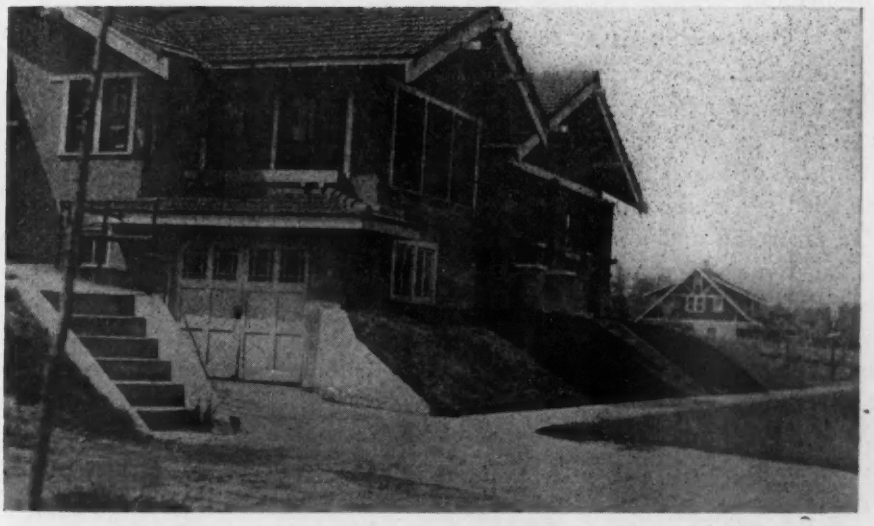
If the house is situated on a sharp side-hill do not give up in despair. One home builder found plenty of room under the kitchen for a full-sized garage and he didn't have to excavate a shovelful of dirt in making the approach.

The house that is built on a high terrace need not necessarily call for an excavated drive. Build up the garage, as did one owner, and lead up the drive to it by gentle inclines. This gets away from the excavation evil. Still another bungalow owner, whose lot was only a few feet above street level, made a slight excavation and had plenty of room to park his car in the basement.

The built-in garage has still another advantage: It gets away from the driveway, the old-fashioned, clear-across-the-lot driveway. In these days of high paving costs, that means something like a thousand dollars in favor of the built-in, and nearer the street garage. One kills not only one "bird" with this stone, but many!

✣

PAINT that is peeling rolls back from the surface in thin scales. A coat of paint put over a seemingly good surface will sometimes peel down to the bare wood or to the priming coat, showing that the old paint has lost its grip. Be on the lookout for this condition when repainting surfaces. The old paint surface should be well wire-brushed and the bare spots touched up with a thin coat of paint.



Solving the Garage Problem on the Corner Lot. Many Motorists Have Found They Can Go the Whole Winter Without Radiator Solutions. This Removes One of the Big Bugaboos of Winter Driving.

# Law for the Builder

**RIGHT OF OWNER TO REFUSE TO PAY CONTRACTOR FOR WORK DONE PURSUANT TO CONTRACT, WHICH IS SILENT AS TO TIME OF PAYMENT, UNTIL CONTRACT HAS BEEN COMPLETED**

**By Leslie Childs**

THE question of a fair understanding relative to the time payments due for work done in fulfillment of a building contract is of vital importance. And, when the probable effects on the contractor of an omission to cover this point is considered, it would seem that it should be one of the first questions to be taken care of upon the entering into of a contract of any magnitude.

But strange to say the law books contain many cases of contracts, involving the expenditure of considerable sums, being entered into without the scratch of a pen to show when payment for the work was to be made. In many of these cases the contractor has been placed in a difficult position because of the owner's refusal to make payments until the work has been completed. And as a general rule the owner is within his rights in refusing to pay until completion, for the weight of authority holds, that where a contract is silent as to payment, it is not due until the services have been rendered.

"Stewart, having progressed with the work as far as the first floor, sent in a bill for $896.35. The Newbury Mfg. Co. refused to pay the bill."

A recent case, illustrating the danger to contractors of entering into contracts which are silent as to the time of payment, is Stewart vs. Newbury, 220 N. Y. 379, 115 N. E. 984, 2 A. L. R. 519. The circumstances which led to the dispute and lawsuit were in the main as follows:

### Contract Silent As to Time of Payment

Alexander Stewart, contractor and builder, entered into a contract by letter with The Newbury Mfg. Co. to do certain work on a building. The written contract consisted of two letters. In the first Stewart offered a detailed bid on the work; in the second The Newbury Co. answered and accepted the bid. No mention of when payment for the work was to be made was embodied in either of the letters.

Stewart it appears started on the job in July, and on September 29th, having progressed with the work as far as the first floor, sent in a bill for $896.35. The Newbury Mfg. Co. refused to pay the bill, and Stewart refused to proceed with the work, unless payment was made.

Stewart claimed that in addition to the letters mentioned above he had had a telephone conversation with Mr. Newbury after the mailing of his letter and before the letter of acceptance was received; and that in this conversation it was agreed that payment for the work would be made in the usual manner. According to this Stewart claimed that he should be paid 85 per cent every thirty days, with the exception of 15 per cent which would be retained until the work was completed.

This telephone conversation was denied by The Newbury Mfg. Co., and they took the position that under the contract they did not have to pay anything until the work was completed. The dispute culminated in Stewart bringing an action against The Newbury Mfg. Co. for the amount of the bill rendered and $95.68 damages for breach of contract.

Upon the trial of the cause the trial court instructed the jury, on the matter of when payment should be made where not specified in the contract, in part as follows:

"I will say in that connection, if there was no agreement respecting the time of payment, and if there was no custom that was understood by both parties, the plaintiff (Stewart, the contractor) was entitled to payments at reasonable times."

The trial resulted in the jury returning a verdict for $896.35 in favor of Stewart the contractor, that being the amount of his bill. The jury refused however to allow him any damages. From the judgment of this verdict an appeal was taken, and the case finally reached the Court of Appeals. In passing upon the record, and in particular upon the instructions given by the trial court to the jury, the court, during the course of its opinion, said:

### Contract Silent, No Payment Until Completed

"The jury was plainly told that, if there was no agreement as to payments, yet the plaintiff (Stewart, the contractor) would be entitled to part payment at reasonable times as the work progressed, and if such payments were refused he could abandon the work and recover the amount due for the work performed.

"This is not the law. * * * In fact the law is very well settled to the contrary. This was an entire contract. * * * Where a contract is made to perform work and no agreement is made as to payment,

the work must be substantially performed before payment can be demanded. * * *"

After reviewing the authorities in support of the above statement, the court reversed the judgment rendered in favor of Stewart, the contractor, and ordered the case back for a new trial. Holding in effect that in the absence of an agreement as to the time of payment, there could be no recovery by the contractor until the work had been substantially completed.

The opinion in the foregoing New York case is in accord with the weight of authority on the question under discussion, and demonstrates in a striking manner the predicament a contractor may easily get into by omitting to specify the time of payment for work to be done. By such an omission he may be compelled to finance the undertaking until completion, which in a large contract may amount to quite an extra burden. When viewed in the light of the court decisions on the point, it is obvious that the prudent thing to do is to have a clear understanding as to payment inserted in every contract before it is agreed to, or signed.

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### How to Tell Birch, Beech and Maple Apart

BIRCH, beech, and maple are very similar in appearance, and have approximately the same weight. Hence it is comparatively easy to mistake one of them for another. A method which anyone can use to distinguish them is suggested by the U. S. Forest Products Laboratory. The method makes use of the relative width of the pores and medullary rays in the three woods.

If the end grain of birch, beech, or maple is cut smooth with a sharp knife and examined with a hand lens, the pores will be seen as tiny holes distributed evently over the surface, and the medullary rays will appear as narrow lines of a different shade running at right angles to the growth rings.

In beech some of the rays are very distinct even without a lens. The large rays are fully twice as wide as the largest pores.

In maple the rays are less distinct, and the largest are about the same width as the largest pores.

In birch the rays are very fine, invisible without a lens. The pores are several times larger than the rays, usually being visible to the unaided eye as minute holes on the end grain and as fine grooves on dressed faces of the board. The pores in birch are considerably larger than the pores in beech or maple.

The appearance of the medullary rays on a "quartered" surface is also distinctive. There they appear in beech as distinct "flakes," the largest being between 1/16 and ⅛ inch in height when measured along the grain of the wood. In maple they are considerably smaller, rarely attaining a height of 1/16 inch. In birch they are comparatively inconspicuous.

# Woodwork in the Home

BEAUTY AND EFFICIENCY OF HOME DEPEND UPON CAREFUL SELECTION OF PROPER TRIM—SEE DETAILS ON PAGE 126

ONE of the most important features of the real attractive well-designed house is the trim, or woodwork as it is familiarly called. Carefully selected woodwork combines the three essentials—comfort, beauty, and use—and lends a warmth and feeling of life in the home. Outside it is the finishing touch in the form of an inviting porch, door, or attractive windows. Inside it is the door with its becoming panels, the mantel, bookcase, sideboard, window seats or stairways. To the builder it is one of the most important features of his construction program and for that reason is of considerable consequence. Upon it depends much of the satisfaction of the client.

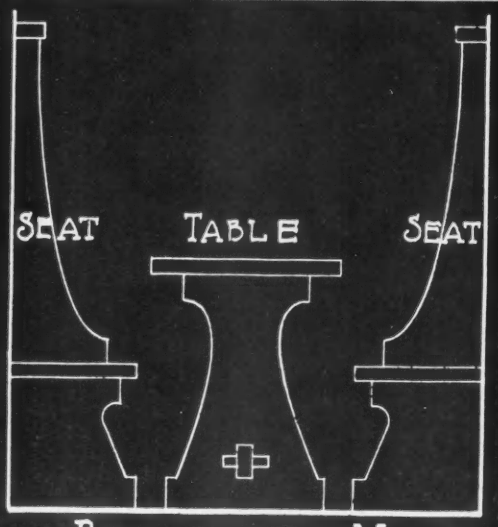
Likewise, it is of importance to the lumber dealer, who is continually consulted by people in his community who are planning new homes. The choice of millwork is left to him in many cases, and he can make the proper selection if he is acquainted with the details of the material. Some of the most prominent details are shown on page 126. Great strides have been made in the standardization of millwork during the last few years, and now retail lumber dealers carry a complete stock on hand at all times, so that there will be little delay when the order is placed with him.

Of this type of material exterior doors are perhaps as important as any other item. Attractive doors are largely instrumental in making attractive homes. Invariably, the favorable impression gained by visitors is due to the distinctive doors which were everywhere so evident. Two essentials of a good door are strength and design. These doors are manufactured in a variety of designs as some of the examples on the blue-print page show. There is the all-wood door with its variety of panels and the wood door with different kinds of glass panels. There is the French door with its expansive glass front and a great many others too numerous to mention. All of these are illustrated and described in complete catalogs issued by reliable manufacturers. Slab doors are very popular because of their distinctive appearance and their sanitary construction, there being no horizontal surfaces to collect dust. In connection with the front door, especially in Colonial houses, the side-lights are manufactured in a variety of attractive designs.

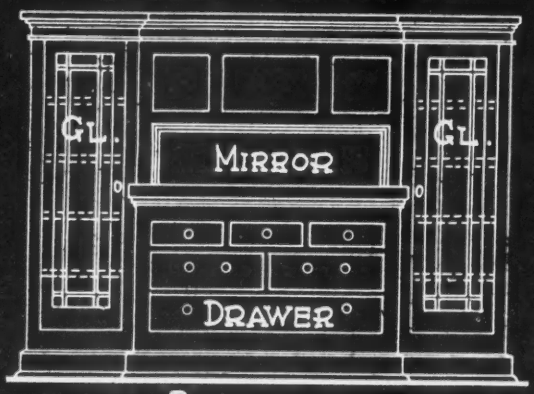
Interior doors are important because they form a large part of a harmonious picture. They are, in a sense, furniture, and should be selected accordingly.

Colonnades are another feature of interior trim that demand the careful consideration of the builder who is seeking to make his handiwork as attractive as possible. They, like doors and windows, are furnished ready to set by the lumber dealers and are made in a wide variety of designs.

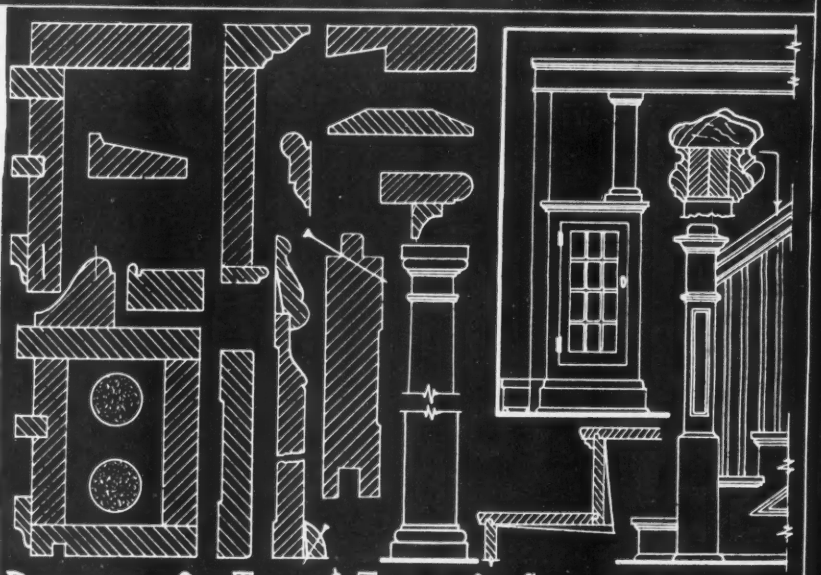
# RECOMMENDED CONSTRUCTION



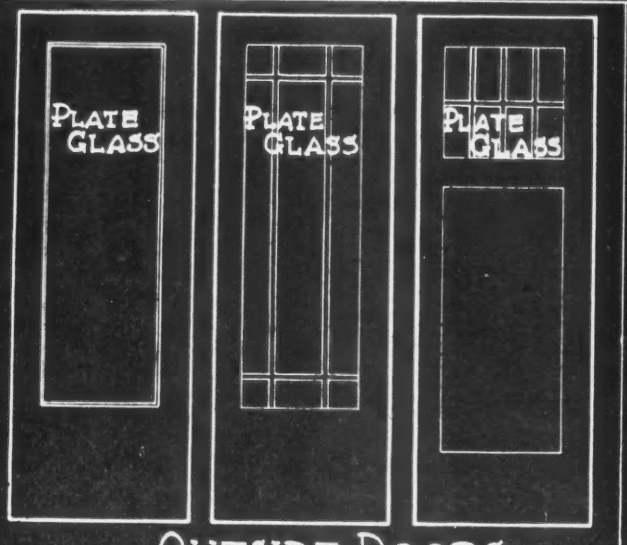

BREAKFAST NOOK



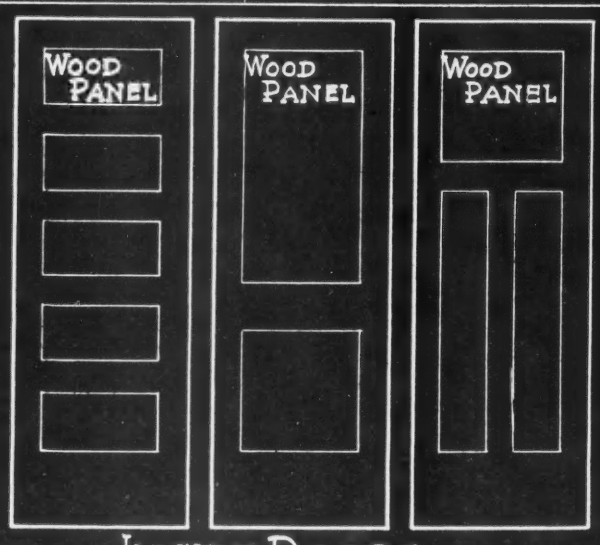

BUFFET



DETAILS OF TRIM & ELEV. OF STAIRWAY

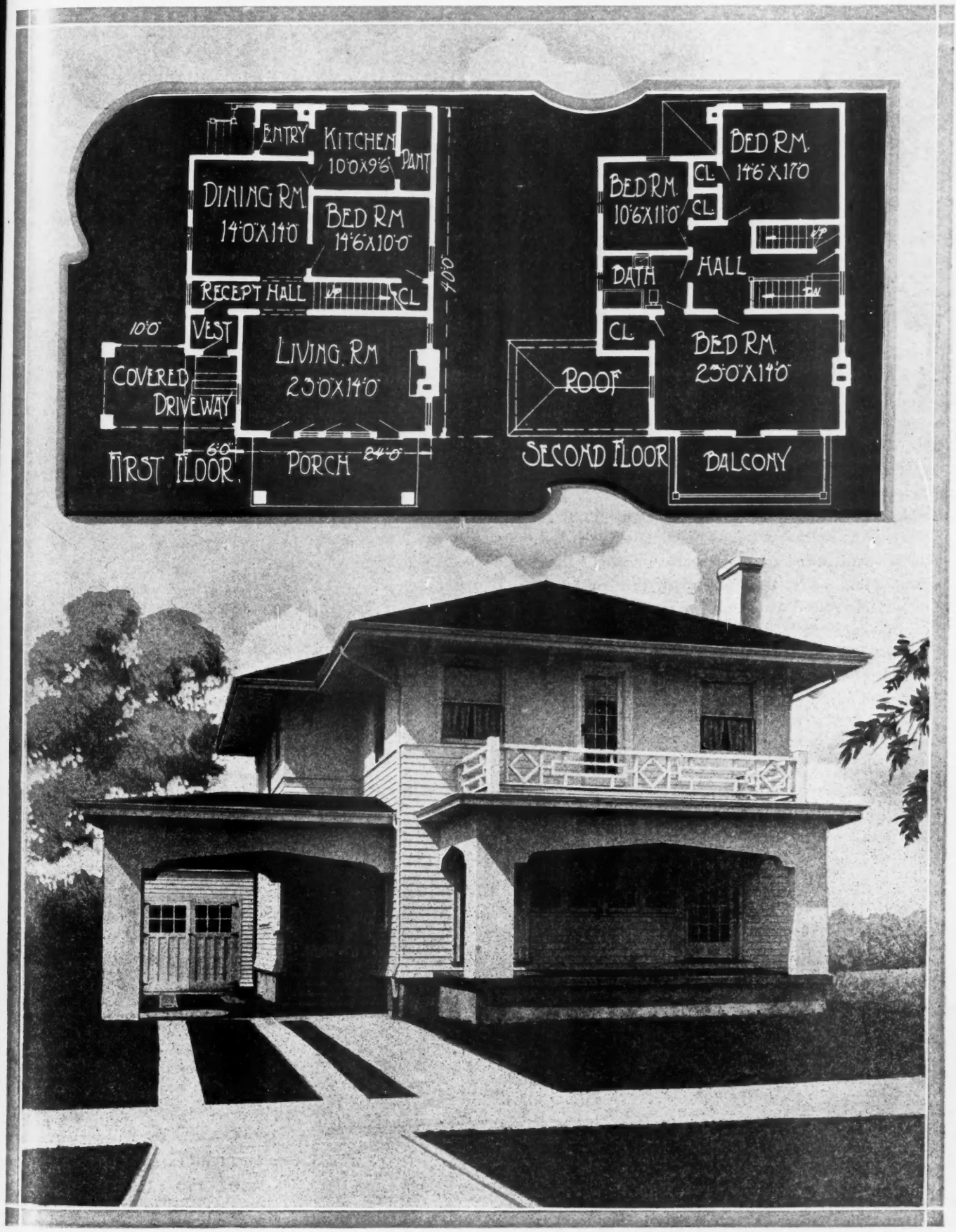



OUTSIDE DOORS




INSIDE DOORS

# MILLWORK & INSIDE TRIM




DISTINCTIVE AND ARTISTICALLY DESIGNED HOUSE. This substantial frame and stucco home should make a favorable impression upon even the most critical of homeseekers. Its splendid exterior, open front porch and balcony, side arch over driveway, and garage in the rear are all effective features in making it an excellent home. Chief among the enhancing features is the beautiful millwork. Details of this important part of building construction are shown on the opposite page. This home contains seven rooms, four on the first floor and three above. The living room is large and comfortable. There are four bedrooms in all, one on the lower floor, the other three upstairs. Ample window space has been provided for all of the rooms; while concrete trackways lead the way to the garage. The size of the house is 24 by 40 feet.

# Damp-proofing and Waterproofing Cellar Floors and Walls

**HOW TO PROTECT BUILDINGS AGAINST DAMPNESS AND IMPERFECT DRAINAGE—MANY MATERIALS NOW AVAILABLE**

**By R. W. Burks**

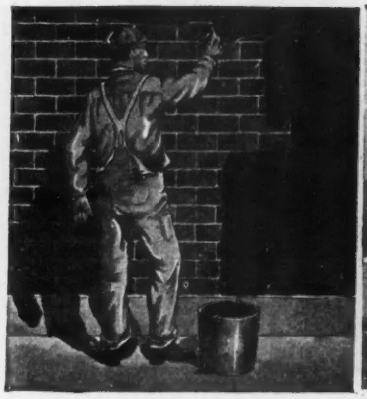
"IT looks mighty good to me," exclaimed the prospective buyer who was being shown thru a comparatively new home by the real estate man. "I believe I'll take it. No, just a minute—I forgot something, I want to take a close look at the cellar. The water table is pretty high in this town and I want to be sure that the cellar is not damp."

The real estate man took a short breath—he knew the game was up. There was the weakness in the structure—he had known it all along but hoped that his customers would overlook it as most would at a first inspection. But this man insisted and found what he was afraid of—damp floors and walls. As far as he was concerned the deal was off.

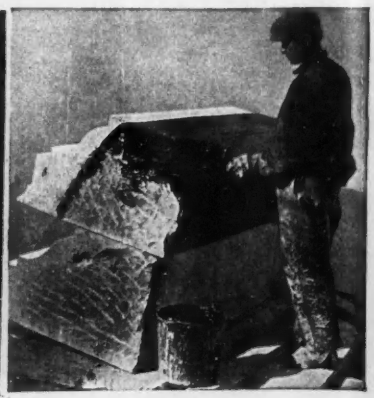
Carelessness and lack of foresight on the part of the builder were responsible. Were he better acquainted with the basic principles of foundation work, the makeup of the soil, the action of ground water, and the construction of waterproof walls and floors, this unfortunate condition could be avoided and complaints eliminated. After all it is one of the builder's chief functions to turn out work that will make for satisfied clients.

The task of building a damp-proof or water-proof cellar is important and depends on certain prevailing conditions.

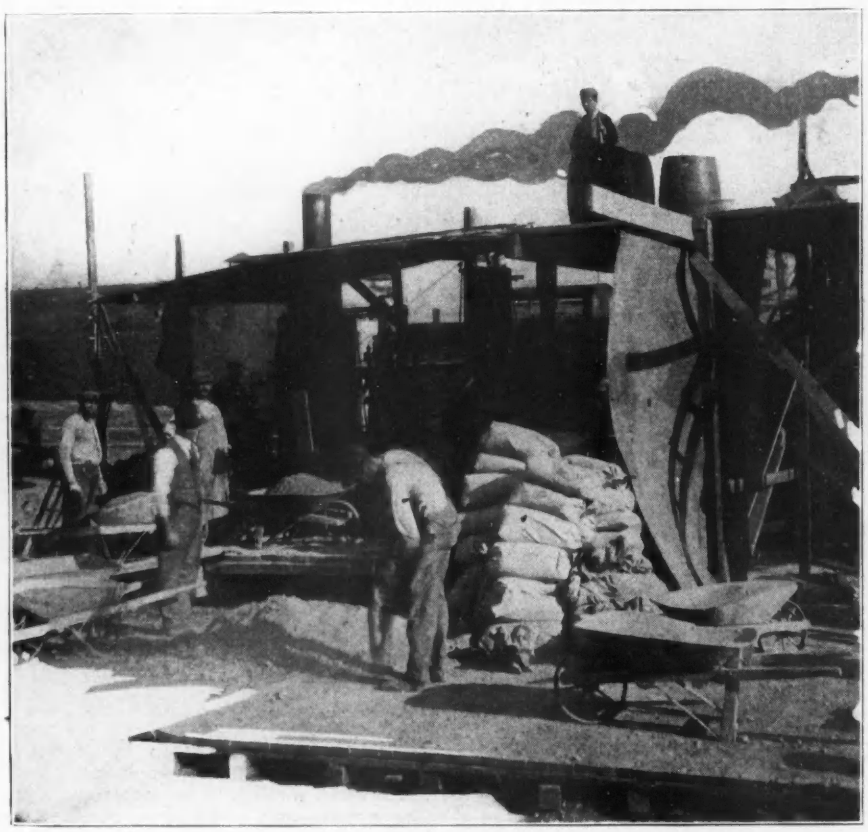
Where the bottom or the walls of a cellar are within reach of capillary water, or small underground streams, dampness is the effect. This water can be intercepted by introducing plenty of free air space or by damp-proofing the floors and walls. Two methods are in common use for keeping this capillary water away from cellar floors. In one method the concrete is laid over a layer of clean, coarse, broken stone or screened gravel about 5 inches thick. This makes an air space available. In case of wooden floors this air space is procured by the use of joists. The objection to this floor is that it lends refuge for rats and vermin. In the first case the layer of stones can be omitted by using a richer mixture of concrete laid directly on the ground.



Applying Waterproofing Material to Brick Wall.



Giving the Stone Trim a Protective Coat Before Fitting Into Place in the Building.



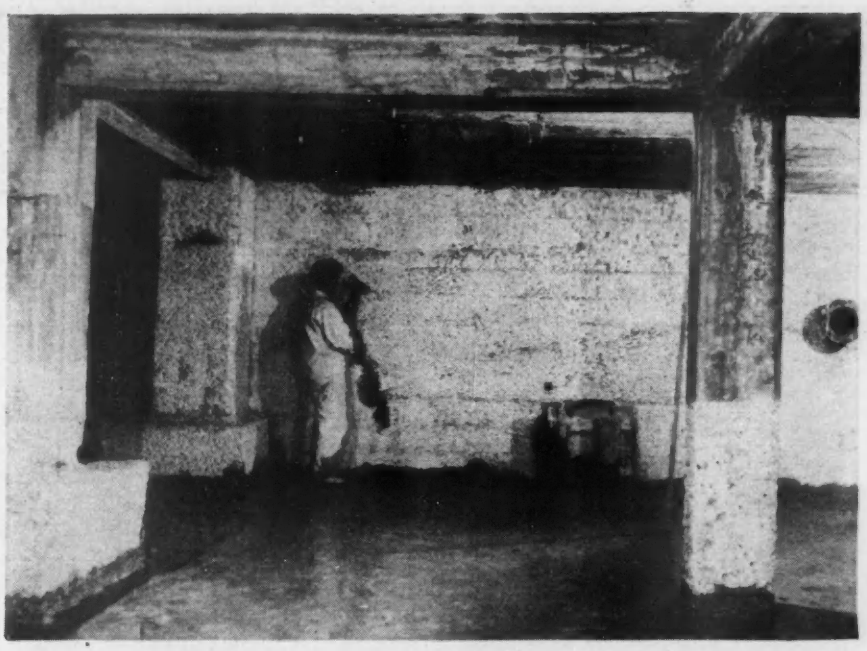
Mixing the Waterproofing Material in the Concrete. This Is What Is Known as the Integral Method. The Whitish Powder Is Mixed Dry with the Cement, as in This Case, or Others in Paste Form Are Added to the Water.

When dampness exists in walls that have been constructed, the most effective way to render them damp-proof is by applying two coats of some specially prepared damp-proofing paint. In this case the surface should be thoroly cleansed and dry and the paint brushed into all pores. The advantage of the paint machine is very apparent in this class of work because it penetrates all of the pores and cracks. Generally one gallon of damp-proofing paint will cover 50

to 125 square feet of masonry, depending on its roughness and porosity.

In many cases a heavy bituminous paint is used for damp-proofing walls before the plaster coat is applied. This coating is applied by the brush or special air painting machines. Very often a priming and bonding coat mixed with a strong penetrating solvent is applied and after it is dry, a tough bitumen compound is added. This method is used extensively to prevent moisture and to shed seepage down walls.

In all cases where damp-proofing paint or coatings are used, the builder should get full directions and specifications from the manufacturer of the product being used.



**Surface Under Course of Preparation for Application of Waterproofing. The Entire Face Is Removed to Expose the Aggregate. Note the Method of Carrying Waterproofing Around Columns and Pilasters.**

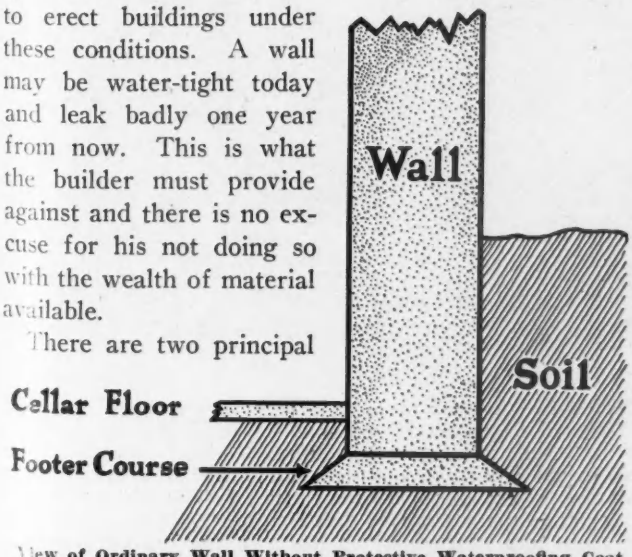
Water-proofing is the term applied to the method used on walls and floors when they are below the water table, and a drainage outlet cannot be secured. Water-proofing is an important job to be done successfully, and one that needs the attention of all builders who are frequently called upon to erect buildings under these conditions. A wall may be water-tight today and leak badly one year from now. This is what the builder must provide against and there is no excuse for his not doing so with the wealth of material available.

**This Shows Foundation with the Dirt Thrown Back, so That Waterproofing Paint Can Be Applied to the Whole Surface of the Wall from the Footer Course up to the Grade Line. The Top of the Footer Course Should Be Coated with Waterproofing Paint Before Foundation Walls are Placed Upon Them.**

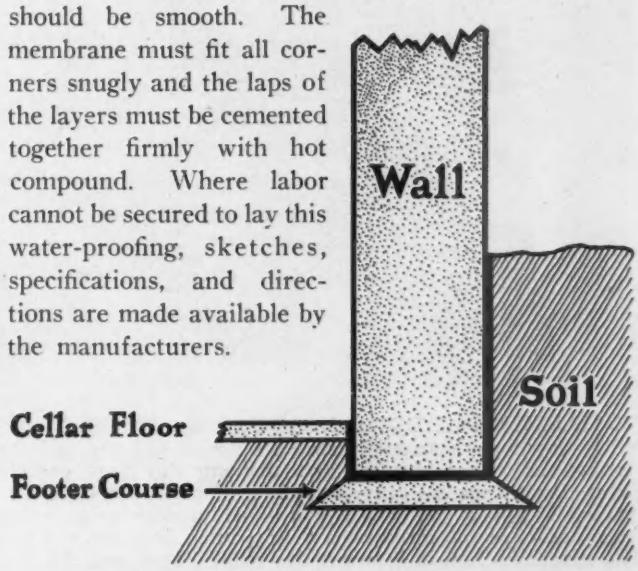
There are two principal methods of water-proofing in use, the integral and membrane. In the former method, mixtures, containing clay, hydrated limes, sodium silicate, lye, soda, alum, paraffin, oil and several other materials, are incorporated in the concrete or mortar during the mixing. In the membrane method specially prepared felt, cotton drilling or other fabrics are put down in overlapping layers, coated and cemented together with hot pitch or some other bituminous compound, the result being a water tight box in which the masonry is set.

In the integral method some of the preparations are in the form of a whitish powder mixed dry with the cement, others are a paste of liquid form added to the water. However, it is important to remember that no water-proofing compound will overcome the handicap of a concrete improperly mixed, one that is not dense and uniform thruout.

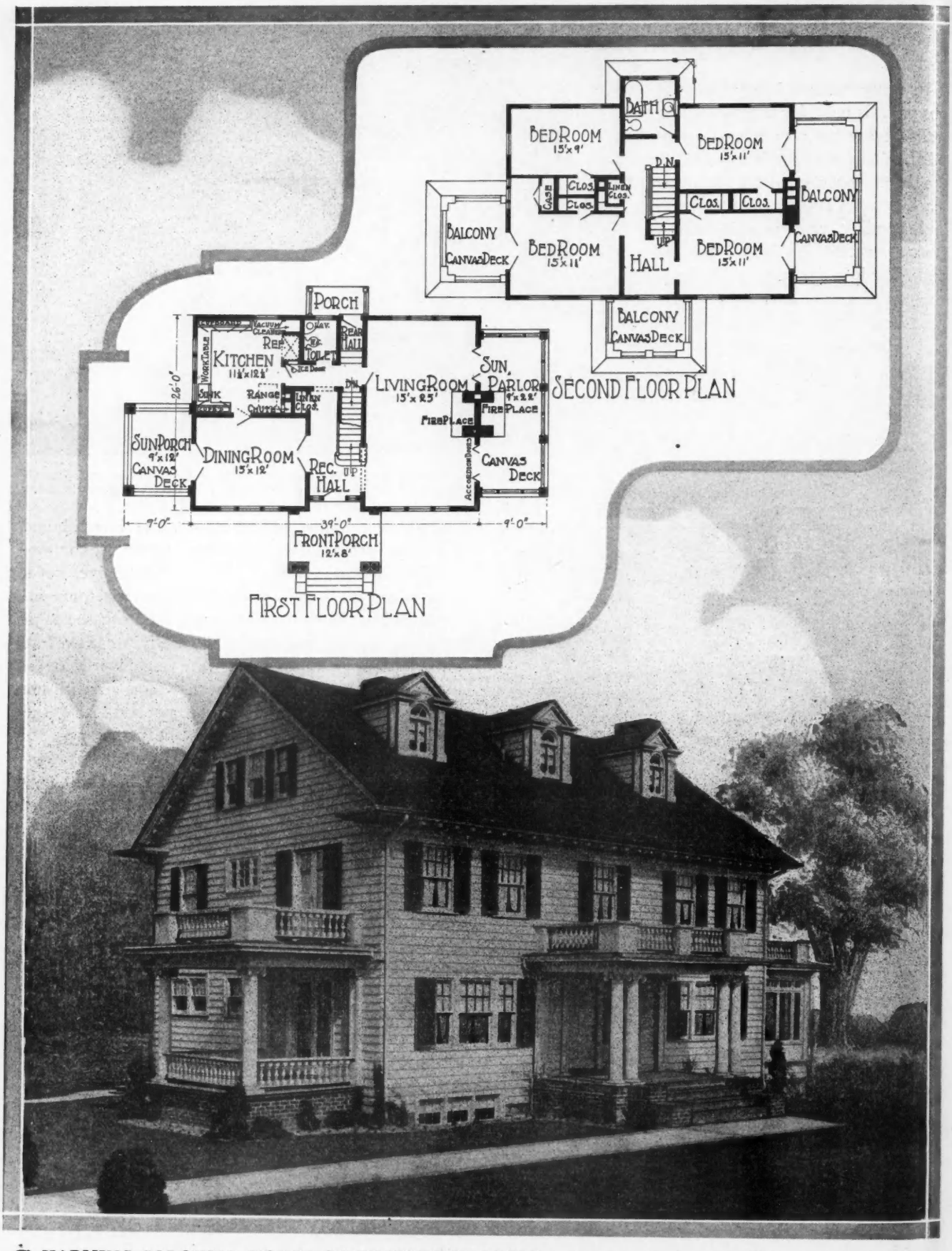
In the membrane method it is important that the surface to which the felt layer or membrane is added should be smooth. The membrane must fit all corners snugly and the laps of the layers must be cemented together firmly with hot compound. Where labor cannot be secured to lay this water-proofing, sketches, specifications, and directions are made available by the manufacturers.




**View of Ordinary Wall Without Protective Waterproofing Coat. Note How Easily Water from the Adjacent Soil Can Penetrate This Wall and Be Drawn Up Thru the Footer Courses and Foundation Walls to the Very Top of the Building.**




**Same Wall After it Has Been Protected by Two Coats of Waterproofing Paint. This Coating Effectively Prevents Moisture from Being Absorbed and the Result Is a Dry Basement and Walls.**



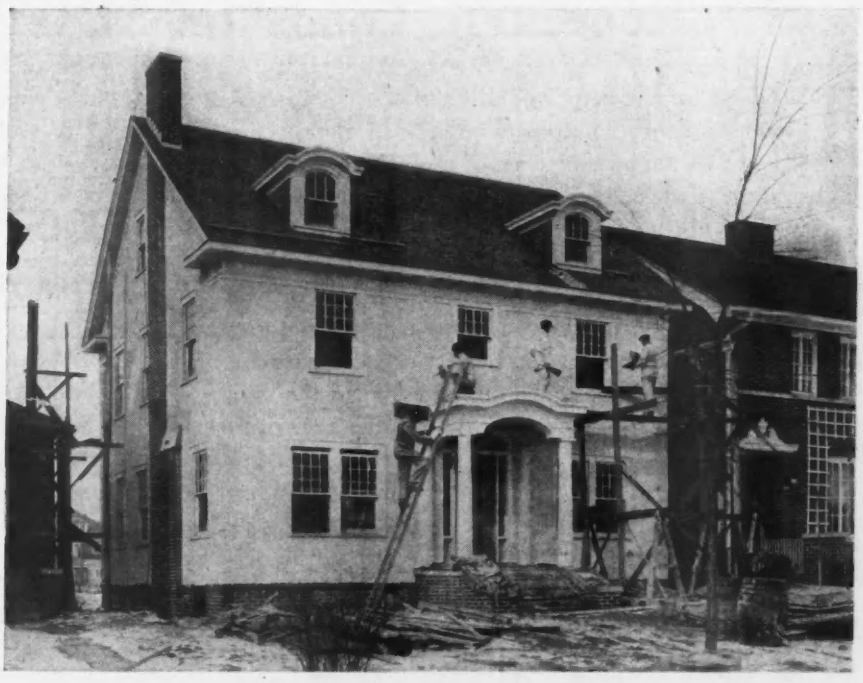

CHARMING COLONIAL HOUSE OF EXCELLENT DESIGN. A most pleasing type of home that never loses in popularity. In many respects the same style as in the days of Revolution, it has been enhanced by modern innovations in the building art. Among the most prominent of these additions is the sun parlor with balcony above covered with special canvas roofing. Open porches are found in the front and opposite side, covered with the same material. Seven rooms are contained in this home, three on the lower floor and four upstairs. The living room is large and cheerful, fitted with a large open fireplace and opening out to the sun parlor thru French doors on either side. The reception hall is between the living room and the dining room and kitchen, which has many of the latest labor-saving appliances. Four large bedrooms and bath are located on the second floor. Size, 39 by 26 feet.

# Stucco Construction in Winter Season

**CONTINUOUS WORK WITH MAGNESITE MATERIAL POSSIBLE BECAUSE OF IMMUNITY OF CHEMICAL SOLUTION TO CHANGES IN TEMPERATURE**

FOR many years the average contractor has looked forward to the winter months as period of involuntary rest. Whether he wanted to work or not, he could not because of climatic conditions. Certain winter months were an absolute loss unless he devoted his time to sidelines. But that condition no longer holds forth. Because of the innovations in construction work, continuous and uninterrupted building is now possible. This is especially true in concrete work and in stucco work, magnesite stucco work in particular.

The greatest difficulty with winter construction, particularly with plastic materials, has been due to the fact that sudden atmospheric changes will freeze the water and make the material very susceptible to frost. A man very often works one day when it is not freezing only to find within a few hours that it has become cold and the material freezes.

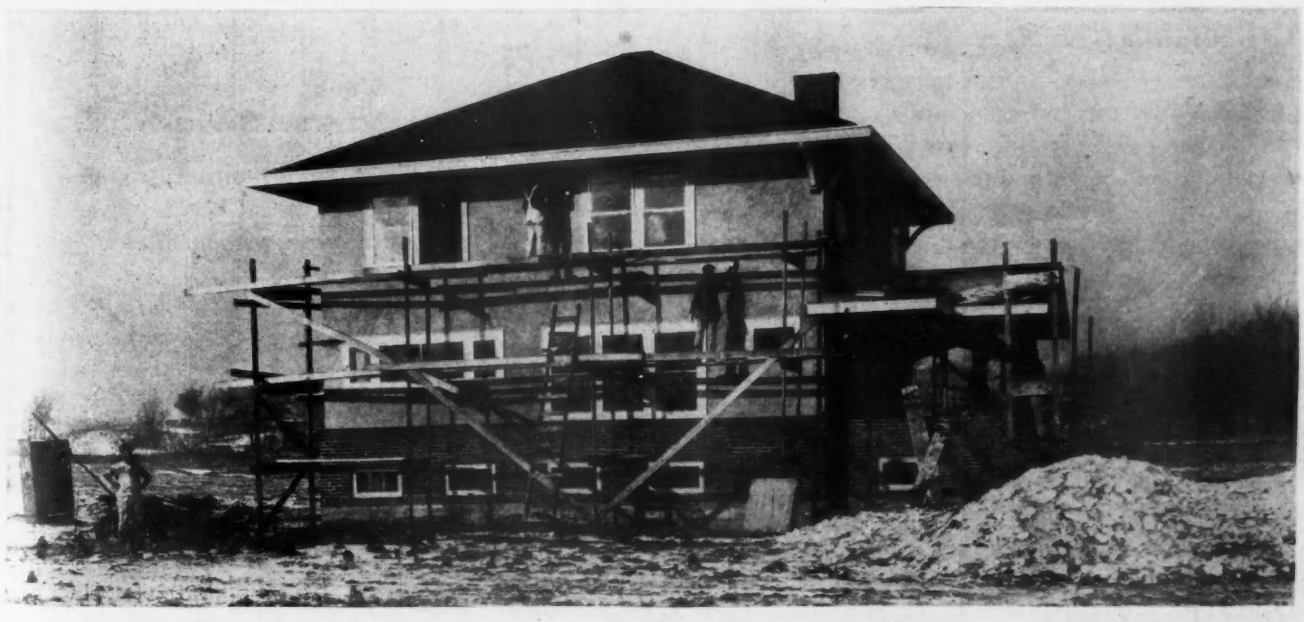


**Winter Did Not Stop This Stucco Job. Robt. W. Speedie, Contractor in Detroit, Believes in Living Up to the Significance of His Name. He Tackled This Work in Dead Winter and as a Result the House Was Ready for Its Owner in Early March Instead of the Usual May.**

Magnesite stucco is not mixed with water, but it is mixed with a chemical solution composed of magnesium chloride dissolved in water. This solution will not freeze and consequently magnesite stucco can be successfully applied in any temperature in which men can work. As a result, the contractor does not have to worry over sudden changes, even if the thermometer should go as low as 20 degrees below zero. The only difference in the setting up process in this case is the speed with which the work can be completed. It is slower than during the summer months. At all times care should be exercised that the magnesium chloride solution is at 21 degrees Baume. This precaution applies to warm as well as cold weather.

It is also important in winter work where magnesite stucco is being used to have the surface over which the stucco is to be applied free from frost and mois-

(*Continued to page 134.*)



**Up in Minneapolis, Minn., it Gets Mighty Cold During the Winter Season, but That Does Not Deter Some Contractors Who Make a Specialty of Stucco Work from Continuing Their Activity. This Is One of Three Homes That Was Completed During the Cold Weather. Stucco Can Be Applied Successfully in This Season if Directions Are Followed Carefully.**

# DESIGN of SAFE CONSTRUCTION

By Charles W. Leigh

Associate Professor of Mechanics, Armour Institute of Technology

## Eccentric Loads on Short Columns

ARTICLE 12 OF AN EXTENSIVE SERIES ON STRENGTH OF MATERIALS

THE November article of this series was a discussion of short columns with a load not at the center of the bearing area of the column. It was shown there that such a load has the same tendency to crush the fibres of the column as if it were applied at the center, and in addition a bending effect. This bending produces compression in the fibres of the column on the side of the load and tension in those on the opposite side. The total effect is a compressive force on the load side of the column equal to the sum of the two compressions and a fibre stress on the opposite side equal to the difference of the stresses. The result may be a tension or a compression stress, depending on which is the greater. It is very important that the designer should understand the calculation of these forces. In brick or cement work where little or no tension is desirable, the tension stresses must not be allowed to become greater than the compressive stresses. This can be governed entirely by observing a rule to be stated a little later.

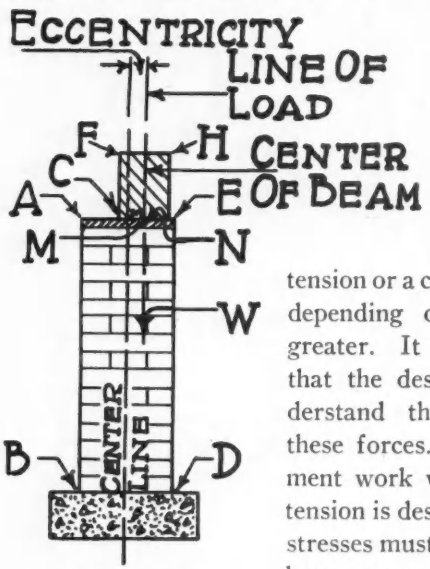



Fig. 1. Brick Pier Resting on Concrete Foundation, Carrying a Beam That Is Not Placed in the Center.

Fig. 1 shows the end section F C E H of a beam with one end resting on the column. The center line of the column is then M, and the center line of the load, N. Let $W_1$ be the load on the column acting at N, *a* the distance M N, and *e* the distance A M. Also let A K L S be the top base of the pier, Fig. 2. M T is the neutral axis of the section, along which no stress occurs. N V is the line along which the load acts. A rule to follow in the case of rectangular columns is that if the load is placed so that the distance *a*, or M N is less than ⅙ A S, the side of the rectangle, then the combined stresses at A cannot be tension. If the load were placed between T M and A K and less than ⅙ A S from T M, the stresses over the entire section would be compression—that is, if the load is anywhere in the middle third of the section of a rectangular column, there is no resultant tensile stress.

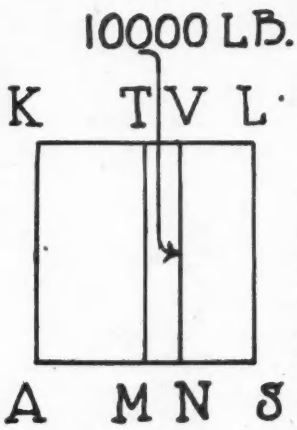



Fig. 2. Base of the Pier.

Suppose the column is 12 inches square and 10 feet high. Then A S = A K = 12 inches. Since the height, 120 inches, is only ten times the lateral dimension, 12 inches, the pier be treated as a short column. Let $W_1 = 10{,}000$ pounds, acting along the line V N. Now, ⅙ of A S, or 12 inches, gives 2 inches. To illustrate the working of the above rule, the stresses will be found for $a = 1\frac{3}{4}$ inches, $a = 2\frac{1}{2}$ inches, and $a = 2$ inches. In the first case the resultant stresses will be compression, while in the second case the results will show compression on L S and tension in A K. In the third case we will find compression on L S with zero or no stress in A K.

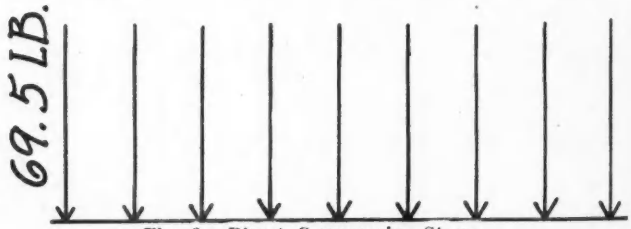



Fig. 3. Direct Compressive Stress.

The load $W_1$ will cause a uniform compressive stress on the fibres of the beam equal to the load divided by the area of the cross-section. Let $P_1$ represent this stress. Then

$$P_1 = \frac{10{,}000}{12 \times 12} = 69.5 \text{ pounds}$$

The stresses are shown in Fig. 3.

Now, a load of 10,000 pounds applied along the line N V, causes a turning effect about the neutral axis M T. This results in compressive stresses on all the fibres to the right

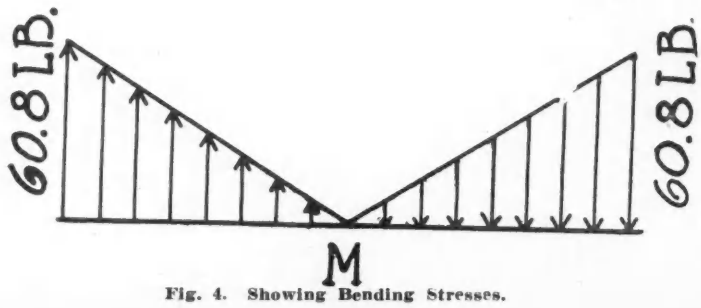



Fig. 4. Showing Bending Stresses.

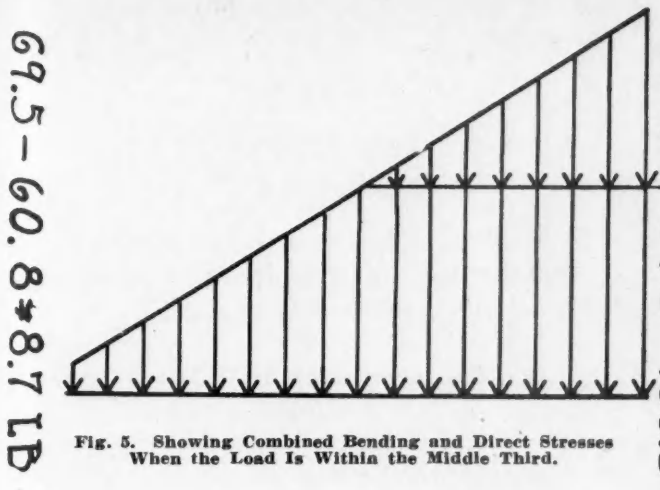



Fig. 5. Showing Combined Bending and Direct Stresses When the Load Is Within the Middle Third.

of M T and tension in the fibres to the left of M T.

From the formula so often used:

$$\text{Bending moment} = \frac{P_2 \times I}{e}$$

where I is the moment of inertia of the rectangle about M T, $P_2$ the fibre stress in the extreme outer fibres and e is M S or A M.

Bending moment = 10,000 × M N = 10,000 × 1¾ = 17,500 inch pounds.

I = 1/12 b $h^3$ = 1/12 × 12 × 12 × 12 × 12 = 1,728, and e = 6.

$$\therefore p_2 \times \frac{1{,}728}{6} = 17{,}500$$

$$p_2 = \frac{17{,}500}{288} = 60.8 \text{ pounds}$$

These stresses are shown in Fig. 4. They form triangles because we have no stress at M, the neutral axis, and these forces increase uniformly to $p_2 = 60.8$ at the outermost fibres.

Since both sets of stresses act at the same time, the resultant effect on the fibres of the section A K L S is a compressive stress equal to 60.8 + 69.5 = 130.3 and decreasing to 69.5 — 60.8 = 8.7 pounds. The bending stresses on M A K T act opposite to the compressive stresses, but they are always less. Fig. 5 shows the combination.

Now, if A = 2½ inches, then

Bending moment = 10,000 × 2½ = 25,000 inch pounds.

I and e remain the same. Then

$$25{,}000 = \frac{p_2 + 1{,}728}{6}$$

$$p_2 = \frac{25{,}000}{288} = 86.8 \text{ pounds}$$

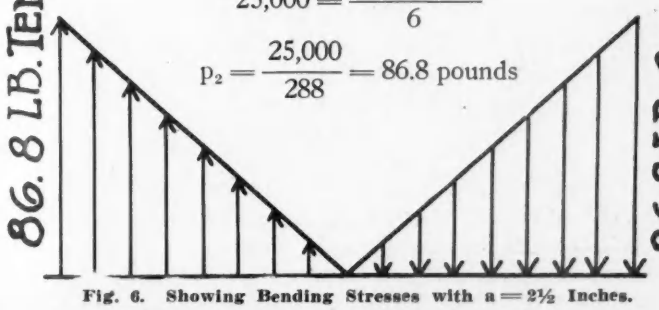



Fig. 6. Showing Bending Stresses with a = 2½ Inches.

Combining $p_1$ and $p_2$ we have a compressive stress at L S of Fig. 2 equal to 86.8 + 69.5 = 156.3 pounds. But at A K the upward or tensile pull due to bending of 86.8 is greater than the direct compressive stress of 69.5. We then have a tension stress of 17.3 pounds along A K. Fig. 7 shows the resultant stresses.

Now let A = 2. Then

$$10{,}000 \times 2 = p_2 \times \frac{1{,}728}{6}$$

$$p_2 = \frac{20{,}000}{288} = 69.5$$

Fig. 8 shows the combined stresses. When the load is at the middle third the stress on A K is just equal to zero.

This problem verifies the rule that when a load is placed on a rectangular pier, if the center of the bearing area is inside the middle third of the rectangle, all fibres are in compression. If necessary to place the load outside the middle third, then the resultant stress on one side of the pier is tension and the other compression. In case the load must be placed so that tension stresses result, then the pier must be of a material to stand tension.

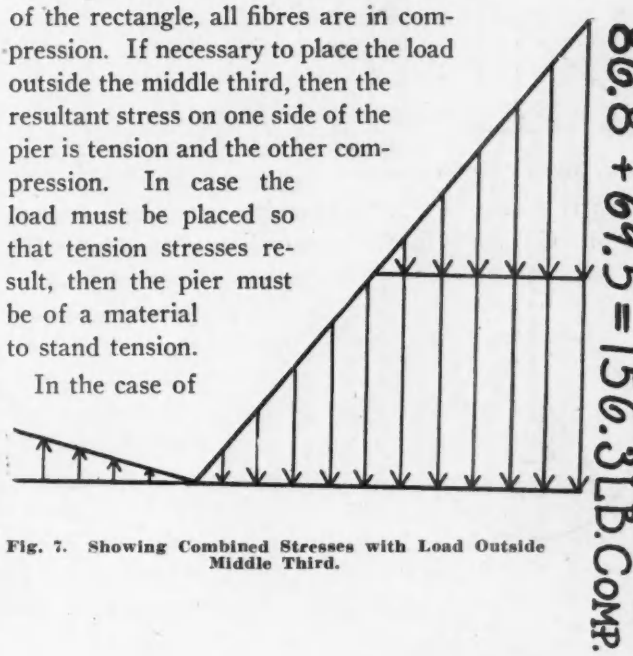



Fig. 7. Showing Combined Stresses with Load Outside Middle Third.

In the case of a circular pier, if the load is inside the middle fourth, then all fibres are in compression. If outside the middle fourth, the fibres on one side are in tension and those on the other side are in compression.

For example, a round solid steel shaft 8 inches in diameter stands vertical and carries an eccentric load, P, as in Fig. 9. Now, one-fourth of 4 = 1 inch. Then if the center of the load is placed anywhere within the circle A B of radius 1 inch, the resultant stresses are compression.

If the reader should solve for the stresses in a solid circular pier, the only change in the formula as used is in the moment of inertia. For a circle the moment of inertia $I = \frac{1}{4} \pi r^4$, where $\pi = 3.1416$, and r is the radius.

For example, in the circle of Fig. 9, r = 4 and $1 = \frac{1}{4} \times 3.1416 \times 4 \times 4 \times 4 \times 4 = 20.1$ inches.

Suppose the pier carries a load of 20,000 pounds placed ¾ of an inch from the center. Then a = ¾, e = 4 inches, the distance from the center to the extreme fibre.

Bending moment = 20,000 × ¾ = 15,000 inch pounds.

Then since bending moment = $\frac{p_1 I}{e}$

$$15{,}000 = \frac{p_1 \times 20.1}{4}$$

$$p_1 = \frac{4 \times 15{,}000}{20.1} = 3{,}000 \text{ pounds}$$

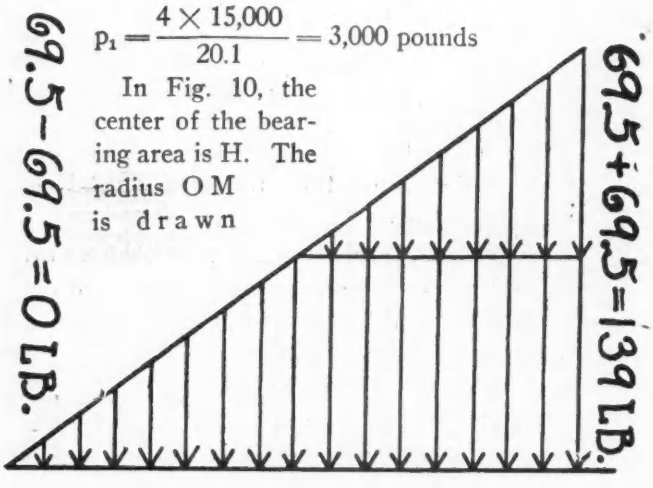



**Fig. 8. Showing Combined Stresses When Load Is at Middle Third.**

In Fig. 10, the center of the bearing area is H. The radius O M is drawn thru H. The diameter C D is drawn perpendicular to O M. C D is the neutral axis or line of no stress. The fibres of the column below C D M are in compression which increase from zero at 0 to 3,000 pounds per square inch at M. While below C D N the fibres are in tension, the stress at N being 3,000 pounds per square inch. The load at B produces a compressive stress over the entire circle just as if it were at 0. To find the stress per square inch we divide the load by the area or

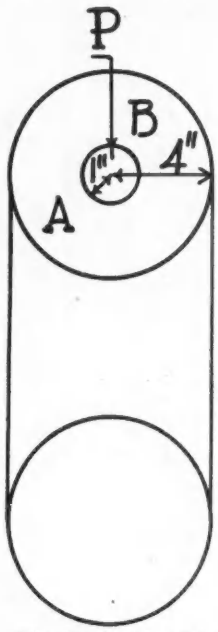



**Fig. 9. Circular Pier with Eccentric Load P.**

$$p_2 = \frac{20{,}000}{\pi r^2} = \frac{20{,}000}{\pi \times 4 \times 4} =$$

400 pounds.

Then at M the resultant stress is 3,000 + 400 = 3,400 pounds.

At N the resultant stress is 400 — 3,000 = —2,600. That is, the fibres at N are in tension. If this pier were of steel or cast iron it would be safe, since cast iron will safely stand a tensile stress of 3,000 pounds per square inch. For safe design, the added stress at the bottom directly under the point M, due to the weight of the pier itself, must be found. If W is the weight, then the stress per square inch on the lower base of the column is

$$p_3 = \frac{W}{\pi r^2}$$

Then the total stress for the design is

$$3{,}000 + 400 + \frac{W}{\pi r^2}$$

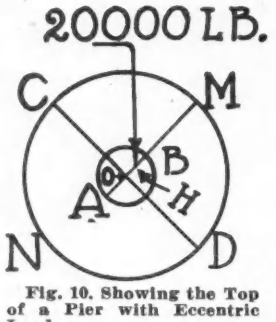



**Fig. 10. Showing the Top of a Pier with Eccentric Load.**

It should be noticed that on the side of the pier opposite the load, the stress due to the weight makes the final tension stress less.

✣

## Stucco Construction in Winter Season

*(Continued from page 131.)*

ture. Before applying the stucco this surface is thoroly moistened with the chloride solution and also wet at the same time the base or finish coat material is applied. If these precautions are followed builders will not have any trouble working with stucco in cold weather. It is not necessary to use canvas or heat while stucco work is going on.

The importance of continuous work during the cold months cannot be over-emphasized, especially in view of the present acute shortage in homes of all kinds. One of the great possibilities for speeding up in building lies in this all-year-round work. Moreover, it has several other advantages which should be considered. It employs labor during a regularly established and accepted slack season; it keeps contractors busy who otherwise would have little to do and consequently adds to their annual income and keeps their organization intact. And finally there is little difficulty in getting materials delivered during the winter months because of general slackness in building business at that time. In the illustrations shown here a gang of men are working without interruption during very cold weather.

Instead of waiting until May or June of the next year the owner in each case found his home ready for him in February and March.

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## Big Lumber Order from Europe

THE biggest order for hardwood lumber from Europe since pre-war days is reported and believed to foreshadow heavier lumber buying on the part of foreign interests. A syndicate largely representing European furniture manufacturers has placed an order in Memphis for 50,000,000 feet of hardwood lumber, one hundred cars to be shipped immediately. Financial arrangements have been completed thru New York bankers, who are interesting themselves because they want to encourage the export of raw materials to help foreign exchange.

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THERE is a long winter between now and the time when the demand for building material is the greatest—next spring and summer. Utilize it by accumulating a supply of concrete products.


**The Greatest of All Gifts, One That Will Insure Lasting Happi ness and Security to the Family, Is a New Home. In This Season When So Much Money Is Squandered on Non-Essentials Which Are Tossed Aside and Forgotten Almost as Soon as They Are Received, the Joy and Real Comfort That a Home Will Bring Should Not Be Overlooked. It Is the Ideal Christmas Gift.**

# Building Conveniences Make Schools Popular

MODERN SCHOOL BUILDINGS NOW BUILT SO EFFICIENTLY AND ATTRACTIVELY THAT CHILDREN ENJOY ATTENDING CLASSES

**By W. B. Reedy**

REMEMBER the little old schoolhouse down the road—only a matter of four or five miles that you had to cover every morning? It seemed like fifteen on those cold days, and when you reached the building you found it almost as cold as outside with a little dinky stove as the sole source of heat, and the windows patched up where the panes had been broken—mighty poor protection against those howling blasts that whistled by with tremendous force. And in the warm weather, how stuffy that same room was, for there was only one room in the structure, and they did not believe in opening windows. No wonder you played "hookey" when you got the chance.

But "hookey" is getting to be an unpopular sport, not because the truant officers are more efficient, but because the school buildings are. Those vivid memories of the grown generation mean little to the children of the present day who step into "marble halls" of large brick and stone structures, containing cheerful, well-lighted, large rooms with comfortable seats, an assembly hall with stage, fireproof curtain, and a seating capacity that makes real theaters shrink in comparison. Steam-heated rooms fitted with thermostats that never allow the temperature to go below the degree set by the health authorities, ventilated by great blower systems which pour in a constant stream of warm fresh air and draw off the deadly carbon dioxide—these are a few reasons why children like to go to school.

School surroundings have been made so attractive, buildings are built so efficiently today that going to school has been made popular even to the the little "red-haired, freckled-faced kid" who used to raise such "ructions." Most schools have gymnasiums where young bodies can play and develop into healthy men and women; some of the larger schools boast of swimming pools. Such has been the remarkable development in school house construction.

Thanks to the American parent who insists that the best is none too good for his children, and the builder and architect who has introduced many of the features the string has been taken from the hickory stick. Today that implement of torture is either absent or encased in a glass frame as a priceless relic of days when discipline, of the iron brand, reigned supreme—in short, when body ruled the mind. Ideas of teaching school have changed rapidly in the last few years, and with it came the need for new ideas in school construction.

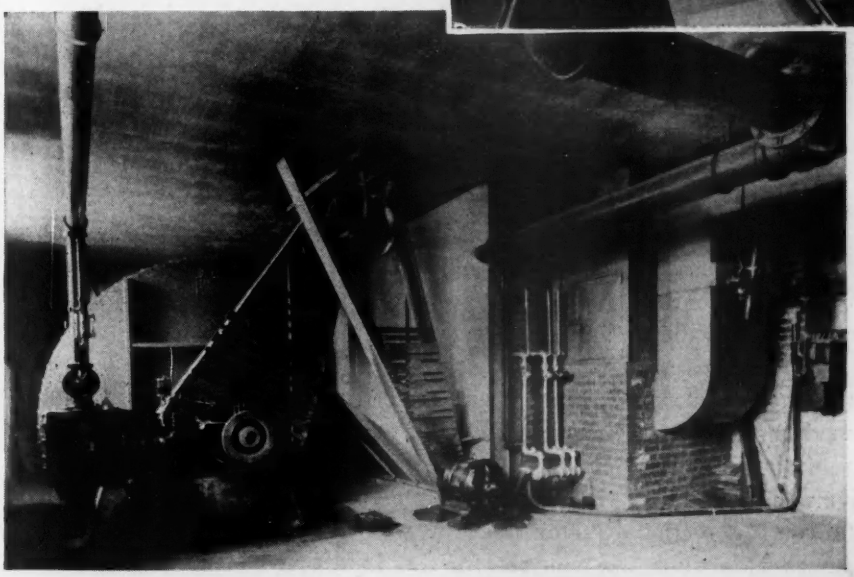
Fresh air is no longer feared, but is rather sought. Weak eyes are strengthened by bright sunlight afforded in bounteous measure by real daylight windows and electric light. The healthy body is essential to a clear, active mind. No longer do parents have to fear that dreaded cry, "Fire," because school buildings today are built as nearly fireproof as possible and

**Schoolrooms Are So Bright and Cheerful in Modern Buildings That Even the Mischievous Boy Enjoys His Work. Builders Are Making "Hookey" Unpopular. If You Don't Believe It, Look at the Cheerful Expression on Larry's Face.**

provided with exits, fire escapes and other means to get out in plenty of time. The new schoolhouse typifies the spirit of the modern age, breadth, vital progress.

Because of the strain involved on young eyes in the study of the schoolrom, lighting is one of the most important features of modern school building construction. As daylight is the gift of nature it should be utilized to the fullest measure. Specially designed windows for school buildings have helped immensely in making sunlight available. And when the days grow short or the sun fails to appear electric lighting fixtures step into the breach. They are so designed as to give the full benefit of

**Plenty of Daylight Is Essential for Two Reasons—Light and Ventilation. Special Windows and Hardware of the Type Shown Here Have Been Instrumental in Keeping the Eyes of the Children Strong and Their Bodies Healthy.**



**Fresh Air Is Important Anywhere, But Especially So in Schoolrooms Where Many Children Are Congregated. Big Ventilating and Blower Systems Have Solved This Trouble—Some Problem in Modern School Building Construction.**

illumination without the glare, which is so harmful.

With lighting comes ventilation, easily one of the big factors in school construction. For without air the health of hundreds of children is imperiled, their faculties dulled, and their physical progress retarded. Well-aired rooms make active minds and healthy bodies. To insure this special windows operated by special hardware insure maximum ventilation without draft. And when it is too cold to open windows wide enough to get a full supply of fresh air, the ventilating and heating systems in the basement take up the burden and pour in a stream of fresh warm air, while drawing off the poison exhaled by the pupils.

Another important part of schoolhouse construction in which the contractor is directly interested is the blackboard. For this work,

**Dust Breeds Germs. And We Do Not Want Germs Around Where Young Children Are Spending Many Hours Daily. The Brush and Broom Helped to Scatter it About—Electric Vacuum Cleaning Plants Gather it Up so That it Cannot Do Further Harm.**

natural slate slabs have been found to be very satisfactory and permanent. Certain definite specifications for the installation of slate blackboards have been prepared by the manufacturers and are available to all builders who have such work in hand.

There Is Plenty of Sunshine and Fresh Air in This Cheerful Schoolroom. Windows Are Responsible. Health Makes for Activity and No One Can Doubt the Genuine Wide-Awake Industry Shown by the Pupils Here.

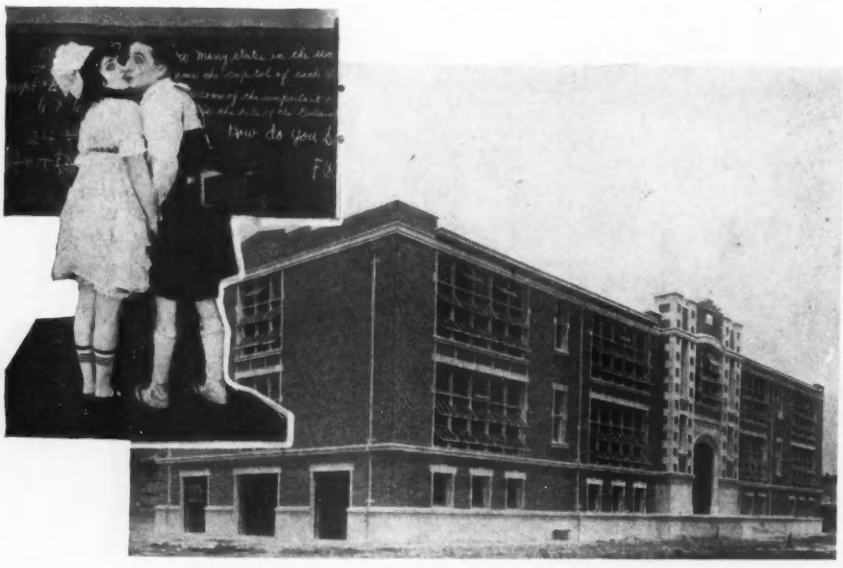
**Seating Hardware**

There was a time not so long ago when the cleaning of a school building was a daily task that terrified the most courageous janitor. However, like many other things in the building and construction field this difficulty has been overcome by the introduction of stationary electric cleaning equipment, such as is shown in the illustration. Connections can be made on any floor and it is a matter of minutes to complete the cleaning task. These cleaning systems are specified in the original floor plans.

Obviously the seating facilities are tremendously important in the construction of a modern, comfortable school structure. Unless they are designed in the proper manner, they will be a positive menace to the physical development as well as mental comfort of the pupils, who must sit in them for hours at a time. Great progress has been made in recent years in the manufacture of hygienic and comfortable seats and desks. While fixed to a certain extent, they have been provided with features and parts that render them more or less elastic and adaptable to the constant shifting and restless activity of the children who occupy them.

Another salient feature in school building construction, and one that is often overlooked or not given the attention it merits by the contractor and architect, is the hardware. This term is rather extensive, including everything, from the hinges on the doors to the safety locks and devices in the emergency exits. Unless the builder knows the requirements of a large structure of this kind he is liable to specify and install something that will prove absolutely inefficient, if not dangerous. Smooth swinging doors and easily operated windows are important in preserving the quiet atmosphere necessary to successful study.

These are only a few of the important items a contractor must be well acquainted with when he takes a contract for this kind of construction. There is so much of the human element that must be considered in the building of a schoolhouse that it makes a subject of many ramifications and detail. But it is worth while, for as long as the world continues to function the school must carry its task and as long as this is the case buildings must be erected to carry on the work. Whether other building is slack or not will not affect this branch of the work because it is so necessary and vital to human welfare. As the builder in your community, are you prepared to handle a project of this nature if called upon? That is the question that every builder should consider.



"Readin', Writin' and 'Rithmetic'." Some Contrast to the Little Old Red Schoolhouse That Used to House the Pupils of a Few Years Back. Sentiment and Efficiency Form a Combination Hard to Beat in Developing the Minds of the Nation's Youth.

# Profitable Season for Installing Weatherstrips

MANY BUILDERS HAVE NICE BUSINESS IN SLACK FALL MONTHS DOING THIS KIND OF WORK

YOU don't have to have a remarkable memory to remember the days when rags and newspapers were the "weatherstrips" that stopped up cracks in windows and doors to keep out the chilling winds. That was only a few years back. But in this progressive age many things can happen in a few years—and this is apparent in the development of weatherstrips. Today the modern metal strip is the recognized type and is used in all well built homes, not only because of the comfort it affords, but because of the positive economy in fuel bills.

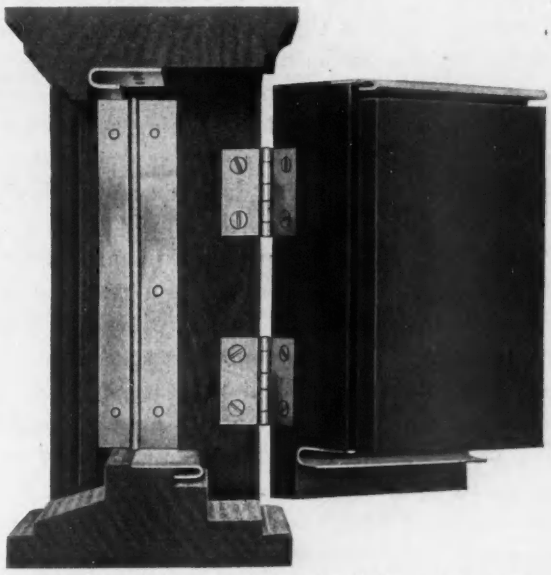
Contractors have found it as attractive as the homeowner because it affords him an extra source of income especially during the slack season in the late fall when it is rather spare and lean. They have made the installation of weatherstrips a regular seasonal job with very gratifying results. The contractor who knows his business can install weatherstrip without trouble. All that is needed is a set of directions from the manufacturer and careful application.

It is much more simple to install weatherstrip in an unfinished building than in an occupied one, but there is a big field in putting weatherstrips in old buildings Systematic planning on the part of workman eliminates this difficulty. In the first place, check the amount of door and window space to be weatherstripped, then figure your weatherstrip. When weather conditions permit, do all sawing, planing and fitting outside. Every carpenter has in his tool kit the tools needed for this work. There are special rabbet planes. however, which are very handy in this work, especially for rabbeting sash and doors for interlocking meeting rails and grooving planes for cutting grooves in sash and frames to fit over the weatherstrip.

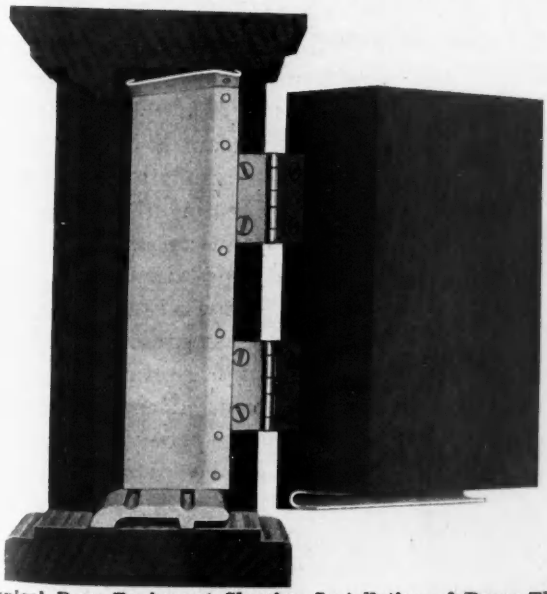
As complete directions were published in a recent number of the AMERICAN BUILDER and can be obtained very easily from the various manufacturers they will not be dwelt on here. However, it is worth while remembering the rule upon which the whole task depends:

"The two meeting rails must match together and be even near both ends; and while in this position, all edges of both sash must be parallel with the adjoining surfaces of the frame."

With this in mind the job becomes simple. The weatherstrip idea has been developed still further in the form of a brass threshold over which the rail fits to prevent any air or dust entering the house. It is shown in one of the illustrations.



**Weatherstrip Installation in Casement Window. Carpenters Can Install This Weatherstrip Without Much Difficulty.**



**Typical Door Equipment Showing Installation of Brass Threshold and Weatherstrip, Effective Fuel Savers and Lucrative Business Getters for Carpenters During the Slack Winter Months.**

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## Million Weddings and 70,000 New Homes

ONE million weddings were celebrated in the United States in 1919, but only 70,000 new homes were erected—400,000 short of the actual needs. In 1890 an average of 110.05 families occupied each 100 homes. Today there are 125 families for each 100 homes and no relief is in sight. With a conservative estimate of 27,900,000 families in the United States by 1925, at least 500,000 homes must be built and then the building program would be on a small scale. At these figures the country would only have 129.06 families for each 100 homes.

If something is not done to remedy the situation by 1926, with the increasing number of families, 2,200,000 dwellings will be necessary. The erection of 3,400,000 homes by 1926 will be necessary if the country returns to pre-war conditions of 115 families for each 100 homes. In certain cities in New York state the shortage of homes is so great that parents, who have searched in vain for new quarters, are, as a last resort, seeking to place their children in institutions.

# Twelve-Months-a-Year Operations Benefit Concrete Products Manufacturers

IN THIS, AS IN OTHER BRANCHES OF CONSTRUCTION ACTIVITY, CONTINUOUS OPERATION WILL HELP TO REDUCE OVERHEAD AND KEEP EFFICIENT LABOR STEADILY EMPLOYED

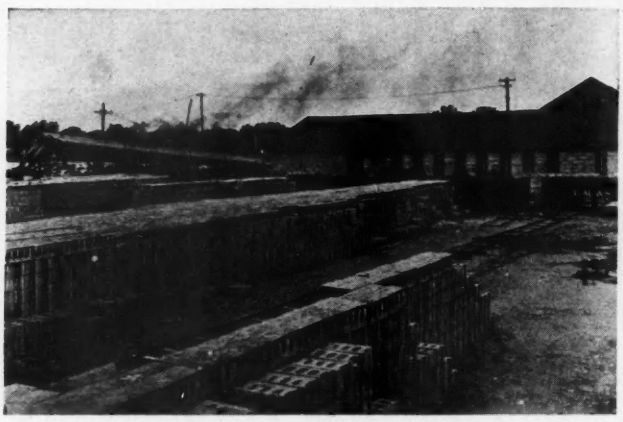
**By R. J. Contis**

IT may be said without fear of contradiction that concrete products manufacture, as well as many other component parts of the building industry, will never produce the rate of return to which they are entitled until operated for a longer season than is commonly the practice at present. Taxes and other overhead for 12 months have to come out of returns from perhaps seven or eight months of active season. In order to produce sufficient material during the short season, extra plant equipment is required. The concrete products plant closed down during the winter is often shorthanded for stock in the spring, and it is difficult to keep efficient plant foremen and high class labor unless steady work is forthcoming.

The task of the concrete products manufacturer in handling all year 'round operation is a two-fold one. He must not only solve the problem of winter manufacturing, but he must also conduct a successful campaign to sell his material and have it placed in the wall during a longer season than at present. The plant which produces only enough to cover immediate sales is prodigal of equipment because it must have sufficient facilities to manufacture as fast as used—even when the shipments are at their peak. Such a plant obviously is unable to handle unexpected large orders for immediate delivery. The plant which manufactures at a steady rate thruout the year secures efficiency of plant operation, but under some conditions finds stock on hand so large as to be burdensome.

If a year 'round manufacturing program is coupled up with an intense—and intelligent—campaign to keep up the shipments of block and tile by opening up the active building season a month earlier and keeping it open a month later than usual, the accustomed volume of business can be done with greater returns to the manufacturer and better satisfaction to the user.

The concrete products manufacturer may proudly throw out his chest and tell you that last season he couldn't keep abreast of the demand; but it is dollars to doughnuts that he lost this trade because he didn't make up a stock in slack season. He simply cheated himself out of what is usually lucrative business. Similarly the manufacturer who neglects to show the trade



**Stock of Concrete Blocks at the Plant of the Spencer Concrete Block Works, Spencer, Iowa.**

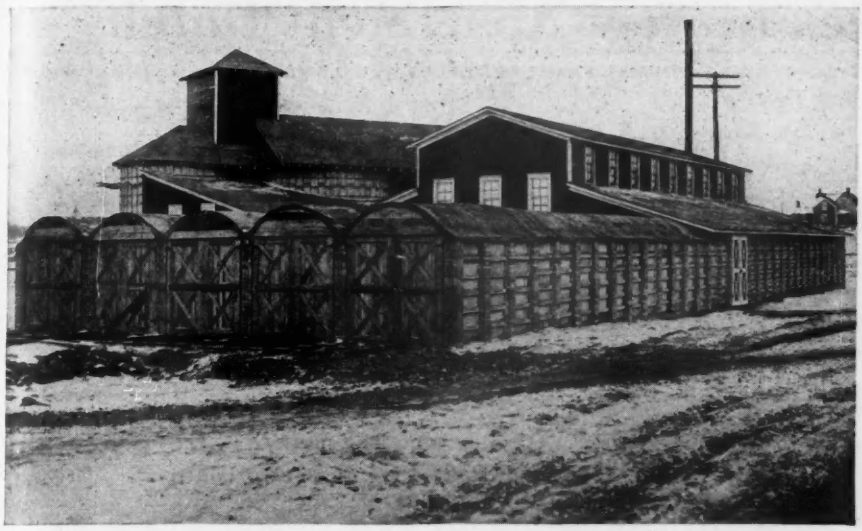
that concrete block and structural tile usually can be laid up in December as well as in September and October and in March as well as in April or May, fails to take advantage of an excellent opportunity to lengthen his season.

### Suggestions for Winter Operation

For all winter operation the concrete products plant must have a workroom which can be kept above 50 degrees, storage bins which can be kept above the freezing point or thawed out as required by steam, and a curing chamber heated to at least 70 degrees and kept thoroly moist. The preferable scheme is to heat the chamber by exhausting steam at low pressure, altho similar results may be accomplished by heating the room with steam coils and continuously spraying with a fog nozzle. Each nozzle ordinarily sprays a radius of 8 to 10 feet. The water pressure should be 10 to 40 pounds preferably.

Steam curing chambers or tunnels designed with winter operation especially in view should have low ceilings and must be tight and well insulated. There should be only sufficient height to accommodate the products on the cars and never any more room between the car and the side than is required to accom-


**Concrete Block and Brick Works of Reinert and Malsch, Lake Geneva, Wis., an All-the-Year-Round Plant Housed in a Substantial Building Where Ideal Manufacturing and Curing Conditions Are Maintained Thruout the Winter.**



**Concrete Products Plant of the Minnesota Cement Construction Company, Fergus Falls, Minn., the Principal Walls of Which Are of Cement Stave Construction. The Curing Chambers in the Foreground, as Well as Other Parts of the Plant, Were Constructed with a View to Winter Operation, Even in Northern Minnesota.**

modate the workmen. Concrete products must remain in the curing chamber, at a temperature of at least 70 degrees, for 48 to 72 hours. At the end of this period they should be stored for 10 days at a temperature above freezing. Somewhat greater chamber capacity should be provided for winter operation.

Boiler requirements for heating steam for curing chambers are usually reckoned at about 16 horsepower per 1,000 block daily output where the block occupy the chamber 48 hours. Such a chamber usually has several compartments, with steam admitted only to those in which block are being cured. Greatest economy is generally secured at boiler pressures ranging from 25 to 50 pounds, the steam being run thru a reducing valve in the main line, in order to reach the lateral lines in the various compartments at about 5 pounds pressure.

Concrete block is an ideal cold weather building material. Wherever it is possible to get a foundation in below frost, block walls may be run up quickly and without danger of damage from frost. Concrete bock laid at temperatures below 40 degrees should be heated to at least 70 degrees and preferably 100 to 125 degrees and rapidly laid up, mixing small batches of mortar, using hot water. Under the above conditions, the heat in the block is usually sufficient to protect the mortar from frost, but in exposed locations tarpaulins are often placed along the walls to assist in retaining as much heat as possible.

The concrete block and structural tile manufacturer can do much to create a winter demand for his material by advertising and teaching local builders the particular advantages and proper methods of handling their material on winter work. Encourage the early spring demand by advertising supplies of material ready for immediate delivery. Some products manufacturers have stimulated the early demand by advertising a discount from the regular prices for block and tile delivered and paid for before May 1, with a similar but smaller discount for delivery and payment before June 1.

There is now an excess of mason labor in many of the big cities which will become more general.

**Two Hundred Fifty Thousand Lengths of Concrete Drain Tile Ready in the Spring for a Busy Season. Concrete Tile May Be Made All Winter Under Conditions Similar to Those Described in the Accompanying Article for the Year 'Round Manufacture of Blocks.**

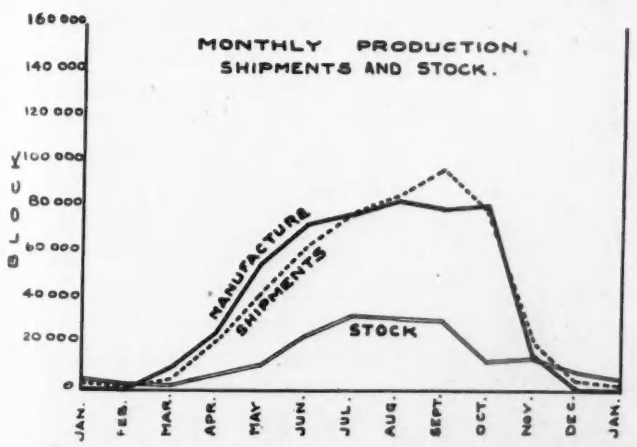
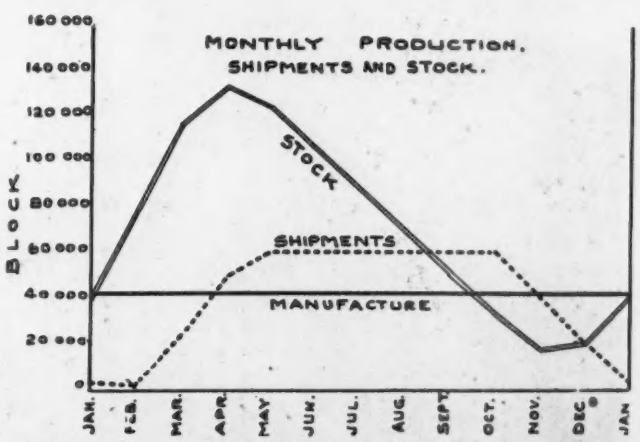



**Diagram Showing Monthly Production, Shipments and Stock on Hand of a Concrete Block and Tile Plant Selling 500,000 Block Annually. Plant Contains Equipment at Least Sufficient to Manufacture 83,000 Block Per Month, Twice the Average Monthly Rate, and Full Capacity Was Used Only in the Month of August. Stock on Hand Was Never Sufficient to Take Care of Rush Orders or Breakdowns. Plant Was Closed Entirely for Three Months and Operated at Limited Capacity for Three Months Additional.**




**If the Plant Operation Illustrated in Fig. 1 Were Made a Year 'Round Proposition, Equipment Only Slightly More than Sufficient to Produce About 42,000 Block Per Month Would Be Required. Stock of Block Would Be on Hand to Take Care of Early Spring Business. Then a Successful Campaign to Advance the Season and Lengthen it Would Enable the Plant to Handle the Same Yearly Volume with Maximum Monthly Shipments of 60,000 Block. Shipping Facilities Would Equal About Two-Thirds of Requirements for Handling Maximum Monthly Shipment of 98,000 Shown in Fig. 1.**

# Many Features in New Apartment Hotel

**EIGHT-STORY CHICAGO BUILDING CONTAINS SIXTY-THREE APARTMENTS OF TWO, THREE AND FOUR ROOMS, FURNISHED IN LUXURIOUS STYLE**

**By George A. Nichols**

THE newest addition to Chicago apartment hotels is the Dorchester Apartment Hotel located at Hyde Park Boulevard and Dorchester Avenue.

Like most of the other apartment hotels that have been erected in Chicago in the last three or four years, the Dorchester possesses many significant points which give it a strong individuality, and at the same time mark some decidedly progressive steps in this type of building.

This progressive development shows beyond all argument that the apartment hotel is an exceedingly live affair. When a thing is 100 per cent alive it is bound to increase and develop. This is why it is that the apartment hotel idea is growing so fast. Another reason is that the business, great as it is, is really in its infancy. There are developments in the Dorchester today that would not have been thought possible a few years ago.

The Dorchester is an eight-story fireproof building. The construction is of reinforced concrete with pressed brick on the outside and cut stone trim. It contains sixty-three apartments of two, three and four rooms. Each has a private bath, kitchennette and breakfast room. Its arrangement and design, shown on the accompanying floor plan, have been declared ideal.

The Dorchester is laid out in a manner that will insure the maximum amount of comfort to its occupants, relieving them of every possible care and worry. It also is built with the idea of obtaining 100 per cent efficiency from its floor space, thus making every dollar of the investment work to the limit. This latter point is one that sometimes—sad to say—is overlooked or at least minimized in the construction and equipment of hotels.

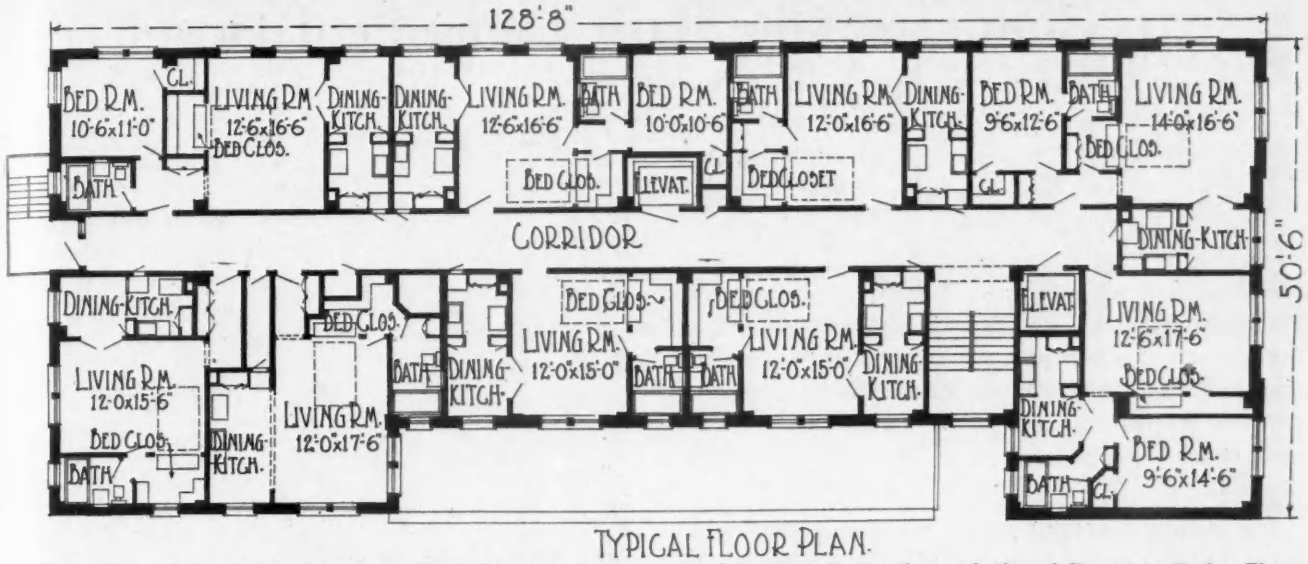
A study of the floor plan will show how marvelously compact and space-saving the Dorchester is—without reducing its comfort or convenience in any way.

**Dorchester Apartments, One of the Latest Apartment Hotels in Chicago, Designed by the Flat Slab Engineering Company. It Is Eight Stories in Height and Contains Sixty-three Two, Three and Four-Room Apartments Furnished in Beautiful Style.**

The first floor has a lobby impressively finished in mahogany—also lounging rooms, a service section and a store. The matter of a store is one that really amounts to something in an apartment hotel. It must be remembered that the watchword is convenience. If the guests cannot be given facilities for quick, easy purchase of food materials, the convenience of the hotel proper is decidedly reduced.

The lobby is fitted with furniture of the Italian Renaissance design, in perfect keeping with the surroundings. The furniture is covered with blue mohair and has antique gold backs. The walls are paneled; the one facing the entrance has a handsome wool tapestry panel ornamented on either side with handsome electric torches. The windows of the lobby have puff shades and velvet over-curtain harmonizing exactly with the general color and style.

One unusual feature is the solarium on the roof. This is furnished and heated so that it can be used at all times of the year. It serves in a double capacity. At any time it can be quickly made into a ballroom accommodating thirty couples or more. It is a simple matter to re-




**Floor Plan of Dorchester Apartment Hotel Showing Arrangement of Apartments, Number and Size of Rooms in Each. There Are Nine Apartments on Each of the Seven Upper Floors. The first Floor Contains Reception Rooms, Lobby, and Servants' Quarters.**

move the furniture and thus give the dancers full sway. The solarium, living up to its name in every respect, has unlimited quantities of sun, light and air. The furniture, in addition to being extremely attractive, is peculiarly adapted to this type of room.

The floor radiators in the solarium are covered with wooden benches. The drapes are of an unusually attractive color combination made up of green, purple and gold. The puff shades are made in a moonlight green of sunfast fabrics over which hang festoons and looped draperies of purple and red. And then following the outline of the windows there are handsome hand-blocked English linen over-curtains.

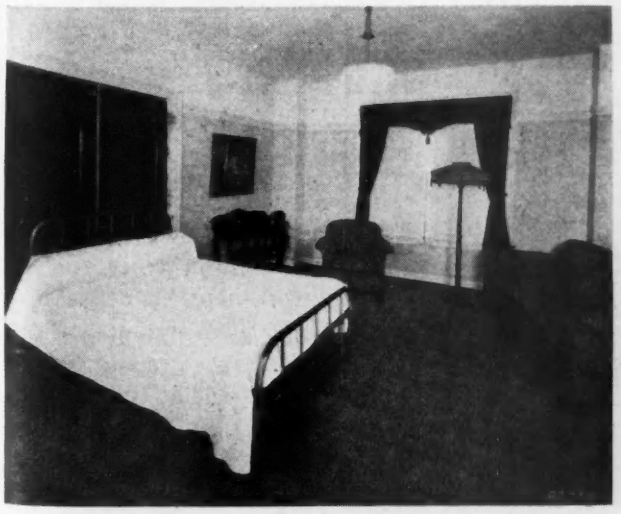
Surrounding the solarium is a terrace or a promenade furnished with lounging chairs and settees of old hickory. This is especially attractive because from it one has a view of the most select part of the South Side as well as of the lake shore.

The hotel is equipped with a vacuum heating plant. It has two elevators, one for freight and one for passengers. The passenger elevator is to be in charge of an attendant at all times. This in itself is an interesting departure from what one sees in some apartment hotels.

The living rooms of the larger apartments are furnished with overstuffed chairs and sofa, a handsome rocker, a library table, writing desk and chair, sofa and table, floor lamp and pictures. All living rooms have handsome jacquard lace curtains with beautiful velvet over-curtains and lambreqins. The smaller living rooms have equipment similar to the larger rooms, but an attractive and useful day bed instead of the overstuffed sofa and chair.

The bedrooms are of two styles, one type containing a full sized bed and the other twin beds. A dresser, bed table, lamp and chairs comprise the other furniture of the bedrooms. Curtains are of the jacquard quality mentioned previously. The over-curtains are of lustrous silk in handsome but simple design.

All kitchenettes are equipped with Windsor type painted tables and chairs. The windows have shades of striped black and blue Austrian cloth over which are valances made in a combination of cretonne and plain material.



**Living Room with Wall Bed in Position. The Smaller Apartments Consist of This Type of Living Room and Kitchenette. During the Day the Bed Is Concealed Behind the Double Door Shown in Wall.**

**Larger Apartments Have Living Rooms of This Type. Note the Kitchenette Beyond the Double Doorway. This Apartment Has Separate Bedrooms Fitted with Standard Twin Beds.**

# Concrete Tile Show Large Profits

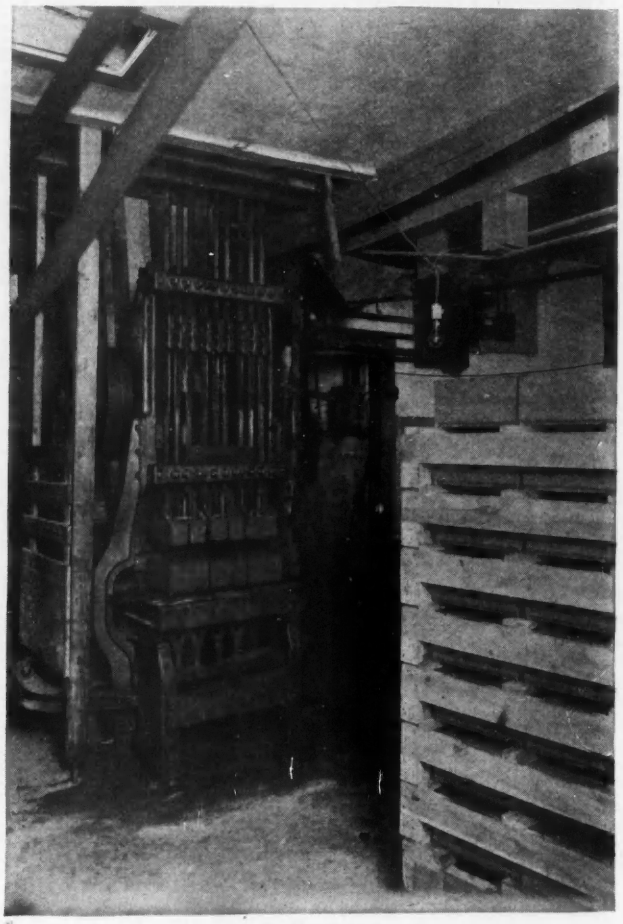
**CLEVELAND BUILDER BUILDS UP LUCRATIVE CONCRETE TILE MANUFACTURING PLANT—SPECIALIZES IN LIGHTWEIGHT UNIT**

TWENTY years ago George D. Barriball started in the building business. He spent some time in all the various branches, but was always inclined to be a little partial towards masonry and concrete work. After mastering the mason trade, he took up contracting, which he followed for several years. But all this time, he cherished a secret ambition to get into the concrete products manufacturing business on a real scale. During these years he studied the concrete field from all angles and became convinced that concrete, and concrete products, were the future building material.

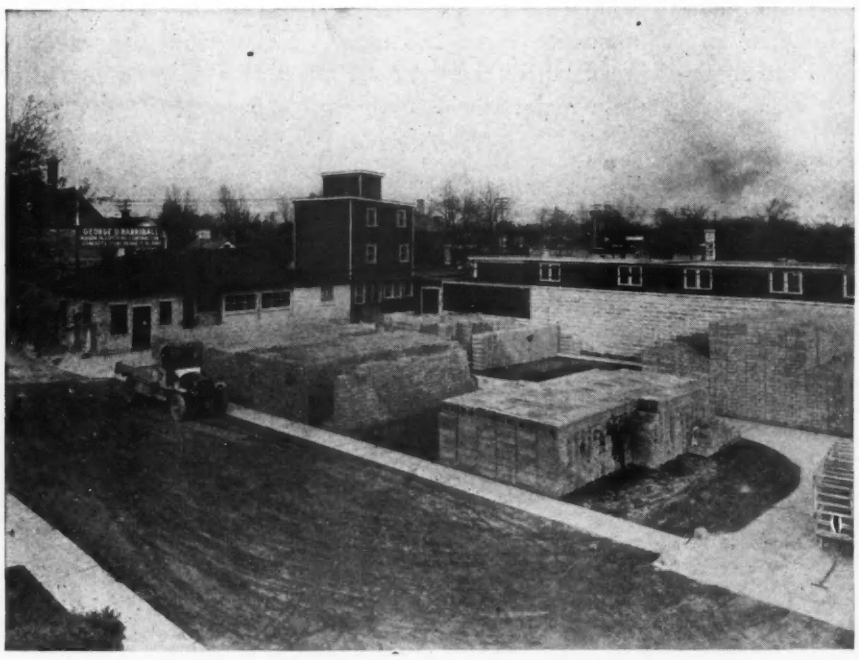
His dream has come true. Starting a small plant several years ago, he has enjoyed such wonderful success that today he is the owner of a large modern, well-equipped plant in Cleveland, Ohio. Since July of last year he has been specializing in concrete tile. He equipped his plants with tile-making machinery that turns out a 5 by 8 by 12-inch unit weighing slightly under twenty pounds.

By the introduction of modern machinery and labor-saving methods, Mr. Barriball figures he is saving five tons of material daily on one machine. He has effected several economies in stacking, loading, and unloading the unit, and consequently has cut handling costs which are a large element in this work.

The material in the Barriball plant is raised by elevators to bins situated above the continuous mixer, and after mixing is fed by gravity direct to the machines. The tile are cured naturally without steam, being kept under a roof at a temperature of about 65 degrees for three days. Then they are set out in a yard for fifteen or twenty days more to attain their full strength. The green tile can be piled 25 feet without breakage.



**One of the Concrete Tile-Making Machines in Barriball's Plant. The Rack Is Full of Tile Being Cured Naturally in a Temperature of 65 Degrees. Three Tile at a Time Are Molded in the Machine.**



**View of Concrete Products Manufacturing Plant of Geo. D. Barriball, Clevelanda Ohio. Mr. Barriball Started in the Building Game Twenty Years Ago and Has Made a Wonderful Success in the Concrete Business.**

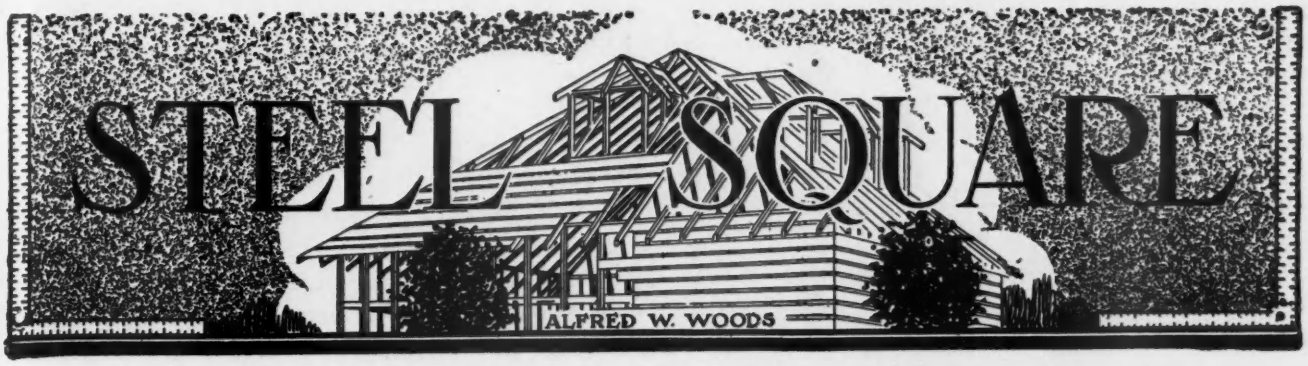
Mr. Barriball has found the introduction of the tile to builders and contractors a rather simple task because of its apparent economy in cost of manufacture and in laying up in walls. In one instance, a mason with the aid of a helper who mixed the mortar and carried the material has laid up 900 tile in ten hours.

✣

WE want good pictures of lumber yards, office window displays, workshops, building plants, etc. Also personal accounts of how our readers have attained success in the building field. Your story may prove an inspiration to some fellow reader.

✣

REMEMBER we are interested in your success.




# Possibilities of the Steel Square

**ILLUSTRATING THE POSITION OF THE DIFFERENT RAFTERS IN AN IMAGINARY CUBE—SHOWING WHAT PARTS ARE TAKEN ON THE STEEL SQUARE TO FIND CUTS AND BEVELS**

THE cuts, lengths and bevels of rafters are all contained in the cube as shown in Fig 1. The base of the cube being twelve inches square, while the altitude is regulated by the rise given the common rafter to a one-foot run, which in this case is 9 inches or ⅜ pitch. This is one of the best methods of fixing on the mind the true position of the different rafters and why certain figures are used on the square to obtain the cuts as shown in the illustrations.

We will carry this thought a little further and show the corner of a hip roof in an imaginary cube with dimensions equal the run and rise given the common

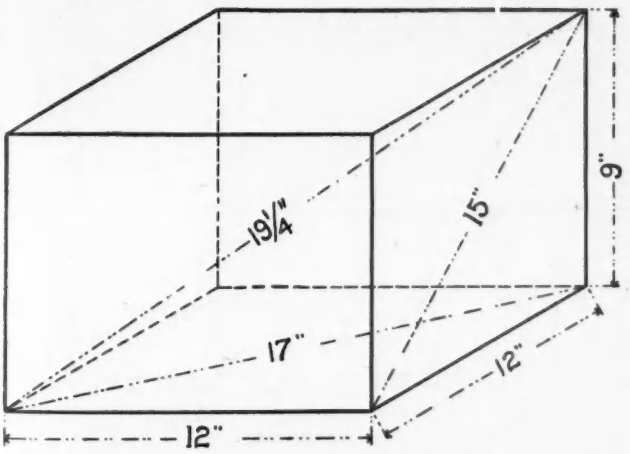



**Fig. 1. Sketch of Cube Containing Cuts, Length, and Bevels of Rafters.**

rafter, as shown in Fig. 2. Here the common rafter, the jacks and the hip are shown in position with their relative runs, rises, lengths, cuts and bevels all shown in this illustration. If the corners of the building are other than at right angles, then the base of the cube would be the same shape as that of the corner of the building.

In Fig. 3 is shown a roof plan with right-angled corners and containing an octagon bay. This answers for any pitch given the roof, as there is nothing in it to distinguish the pitch. In fact it would show just the same if there was no pitch given at all, consequently all of the angles for the side cuts are at an angle of 45 degrees. If there was no pitch, it would simply be the common miter of 12 and 12 on the steel square, 12 being used on one arm of the square because it represents the length of the tangent when the run is one foot and remains so regardless of the pitch given the roof, 12 is used on the other arm of the square because it

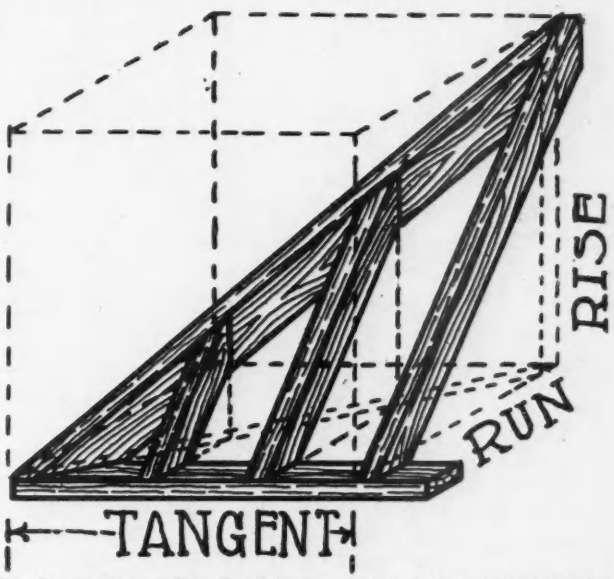



**Fig. 2. Corner of Hip Roof in Imaginary Cube with Dimensions Equal to the Run and Rise of the Common Rafter.**

represents the length of the rafter for one-foot run when there is no pitch given. Therefore, we let 12 on the tongue represent the length of the tangent because it is a fixed number and answers for any pitch. When there is a pitch given the rafters, its length is increased. Thus, in the ⅜ pitch, the length is 15 inches. Therefore, 12 on the tongue and 15 on the blade gives the side cut of the jack as before illus-

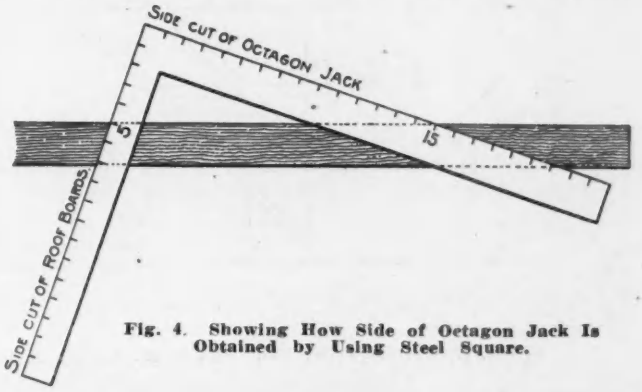



**Fig. 4. Showing How Side of Octagon Jack Is Obtained by Using Steel Square.**

trated. If we were to cut off the peak end of the jack rafters on a parellel line with the seat cut after the side cut has been made, the angle would show just what we started from—the 45 degree angle. For the side cut of the hip, it would be 12 and 66/17, but in order to avoid the fractions it is better to use 17 on the tongue, as described, in connection with the above figures.

The run and tangent in the case of the square cornered building being equal is very misleading, 12 taken on one arm of the square is generally ascribed to the run, when, as a matter of fact, it has nothing to do with it. The run of the rafters and its length (which gives the same result as 12 on the tongue and the length of the rafter for a one-foot run taken on the blade) give the side cut of the jack rafter for the square-cornered building and no other. Not because 12 stands for one-foot run of the common rafter, as is generally supposed, but because the tangent equals the run, and is therefore not a general rule, but one of the things that centralizes at 45 degrees.

Now let us apply our unity rule, which, as will be seen, applies to any kind of a corner, whether square or any other shape. The rule applies to all alike. It is the tangent or the figures on the blade that give the miter when 12 is used on the tongue. These figures transferred to the tongue, and the length of the common rafter for a one-foot run of the given pitch taken

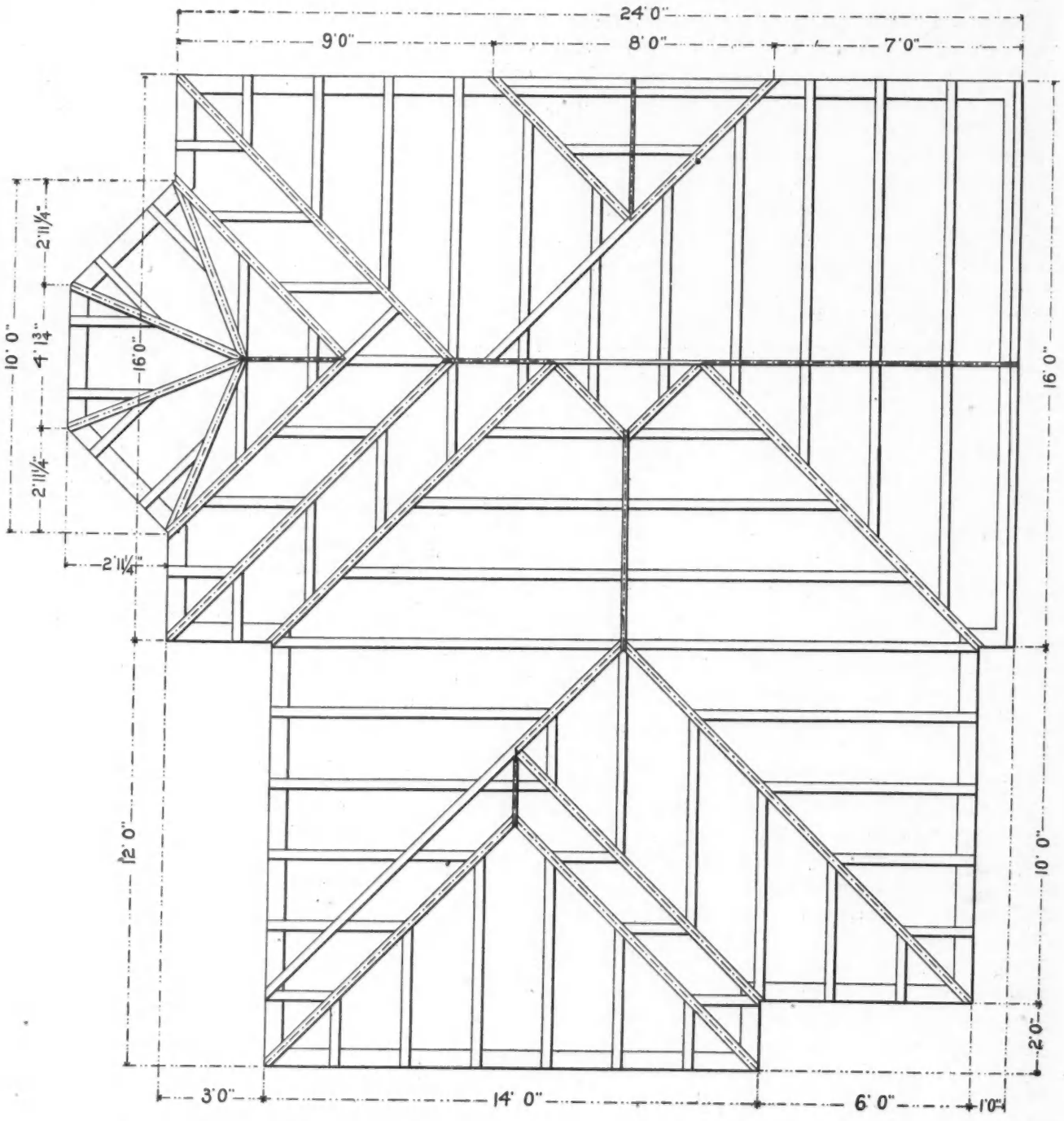



Fig. 3. Plan Showing Roof with Right-Angled Corners and Octagonal Bay. This Answers for Any Pitch.

on the blade will give the cut. The blade giving the cut. Now, for an octagon roof. The tangent for the octagon is 4 23/24 or practically 5 inches. This taken on the blade gives the side cut of the jack, and the corresponding cut across the face of the roof board to fit over the hip. The blade giving the cut in the former and the tongue in the latter, as shown in Fig. 4. What is true of this, is true of any other polygonal roof. In Fig. 5 we show the tangents on the blade for polygons from 4 to 10 and represent the figures to use on the tongue of the steel square instead of 12, as in the square-cornered building. In connection with this illustration is shown the figures to use for the octagon as applied in Fig. 4.

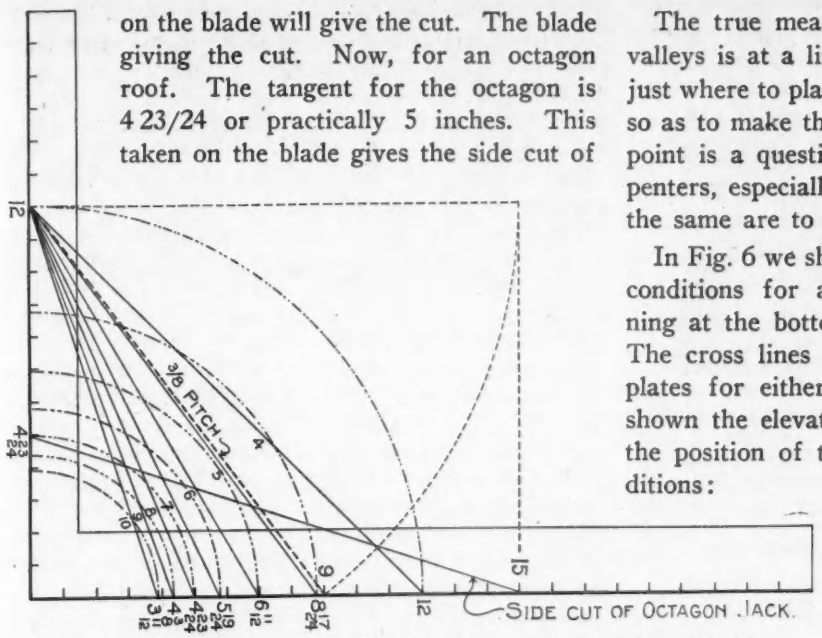



**Fig. 5. Showing the Tangents on the Blade for the Polygons from 4 to 10.**

The true measurement line of all jacks, hips and valleys is at a line along the center of the back, and just where to place the square on the side of the rafter so as to make the cuts and length come right at that point is a question that taxes the skill of most carpenters, especially so in the case of the latter, where the same are to be backed.

In Fig. 6 we show the hip and valley under different conditions for a square-cornered building. Beginning at the bottom is shown the plan of the rafter. The cross lines on same represent the angle of the plates for either hip or valley. Above the plan is shown the elevation. The sections 1-2-3-4 represent the position of the rafters under the following conditions:

No. 1, hip when not backed; No. 2, hip when backed; No. 3, valley when not backed; No. 4, valley when backed. No. 1 is outlined by heavy lines and apparently sits lower than the others. By tracing the bottom line of the sections down to the seat of No. 1, thence up to the second elevation, will show just how far in the seat cut should be for each rafter. No. 1 cuts into the right-hand vertical line above the plan, as at C, which would make it stand at the right height above the plate, at the outer edge of the rafter, but in order to make the seat

*(Continued to page 154.)*

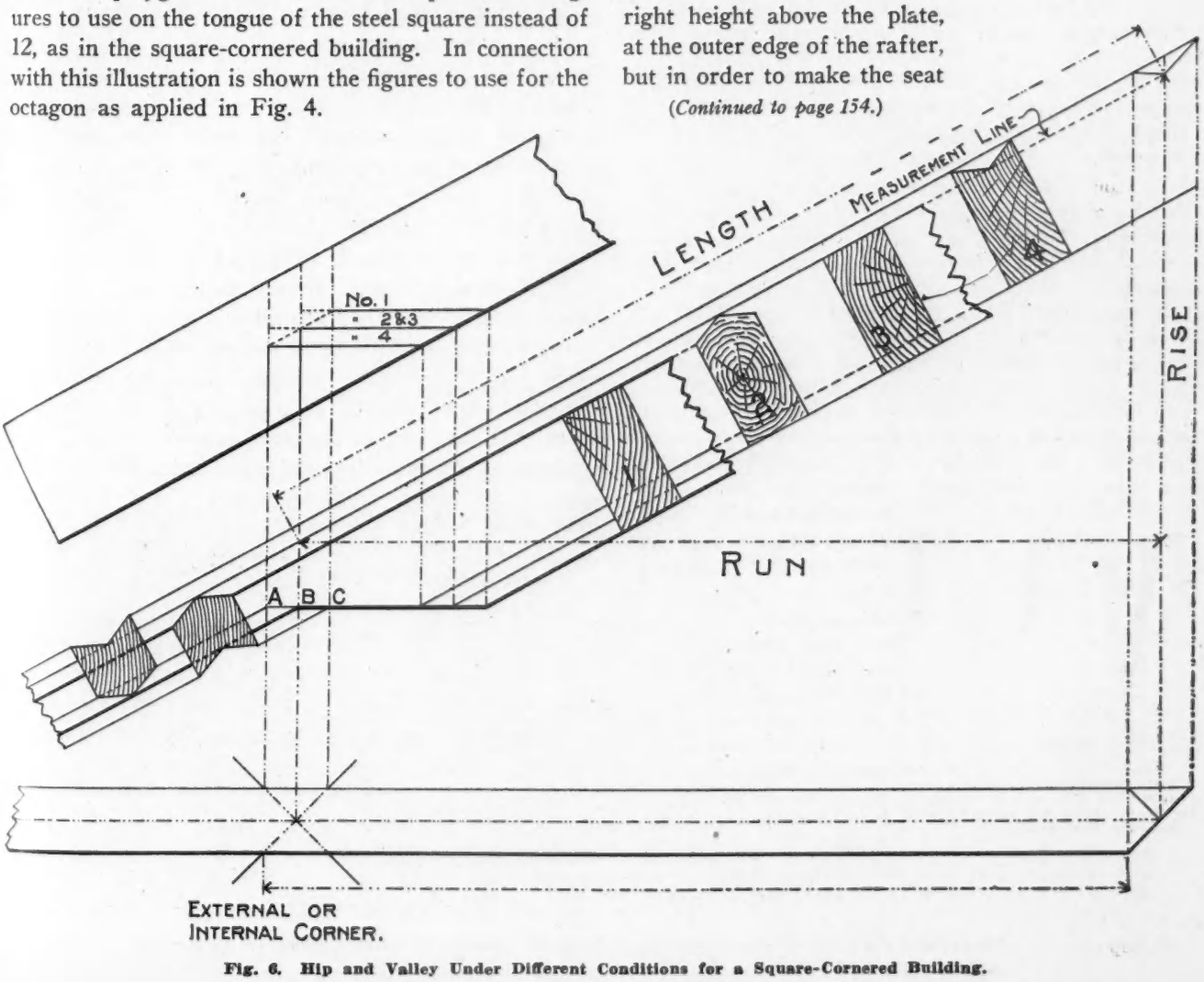
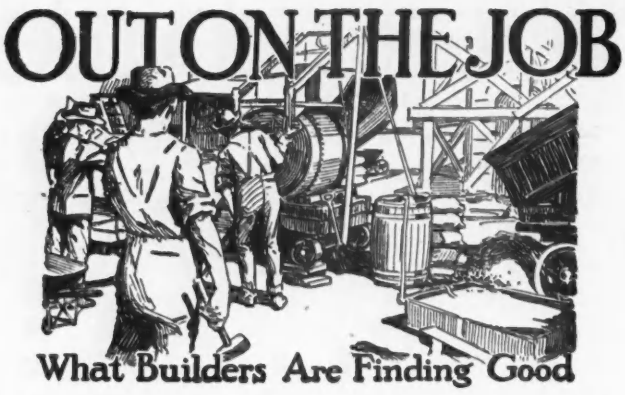



**Fig. 6. Hip and Valley Under Different Conditions for a Square-Cornered Building.**




**EDITOR'S NOTE: The American Builder does not accept payment in any form for what appears in our reading pages. In order to avoid any appearance of doing so, we omit the name of the maker or seller of any article we describe. This information is, however, kept on file and will be mailed to anyone interested; address American Builder Information Exchange, 1827 Prairie Ave., Chicago.**

## How to Make a Good Chisel

CARPENTERS and builders who are constantly using chisels of all kinds will be interested to learn that they can make a very good chisel without much trouble. Good chisel steel is now available and can be bought in various thicknesses and lengths like lumber.

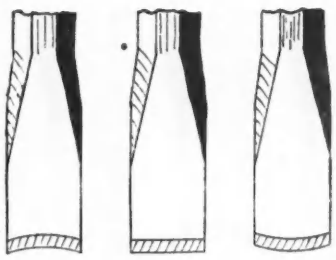
The first step in the process is forging. After the length of steel needed is cut off, it is heated up (the end, about two inches) to a bright cherry red. Then trim off two opposite sides so as to form a very blunt nosed tool. The object of this trimming is to do away with the danger of lapping when drawing out.

The horn of an anvil should be used in drawing out, inasmuch as this will have the least possible tendency to widen the piece, and therefore the minimum amount of "edging in" or hammering on the edge will be necessary.

The reason a chisel should not be hammered on the edge is that the grain of the steel will thereby be distorted or, as you might say, "crumpled up," and this always has a tendency to weaken any metal. If in the final forging operation the chisel gets a little too wide, it can be very easily trimmed off on the emery wheel during the grinding operation.

Draw the chisel out so that it will be about ⅛-inch thick at the end and about ⅜-inch thick 1¼ inches back from the end.

The forging should be finished with light blows until the steel has *almost lost color,* but it absolutely must not be struck *after* the color has disappeared. It is a good thing to reheat the steel to a dull red without using any blast, and give it a second hammering with light blows until the color has again almost disappeared.



**Any Conractor Can Make His Own Chisel Without Difficulty if He Buys Good Chisel Steel and Follows a Few Directions.**

The four important things to remember in forging a chisel are, therefore: Draw out a good cherry red heat, finish with light blows at a dull red heat, do not hammer after the color has disappeared, hammer *as little as possible on the edge* and then only when the steel is fairly hot.

When forging has been completed, grinding is next. Grind the chisel before you harden it, as you can grind faster in this way without the danger of drawing the temper.

The shape of the edge of the chisel is very important, altho it is a thing which is often overlooked. Sketch No. 1 shows a chisel ground with a concave edge. If this chisel is driven down onto a flat surface, it is obvious that a great strain will be put on the corners, and they are sure to break off. Sketch No. 2 shows a chisel ground with a perfectly flat edge. If this chisel is driven down onto a flat surface and held *perfectly straight,* the cutting strain will be distributed evenly over the entire edge, and the chisel should be satisfactory. It must be remembered, however, that it is almost impossible to hold a chisel absolutely straight and, therefore, either one corner or the other will be severely stressed by the chisel being tilted over. Sketch No. 3 shows a chisel ground with a slightly convex edge, which is by far the best for ordinary work. The corners of a chisel are always the danger point, and with the convex edge these corners are protected even when the chisel is tilted considerably to one side or the other.

After the chisel has been ground to the desired shape, heat it to a dull cherry red color for about 2½ inches from the end and quench it vertically in cold water to a depth of 1¼ inches, moving it up and down until no red color is left in any part of the steel. The part which has been drawn out should now be polished with emery cloth and the temper drawn to a dark purple or a blue by holding the chisel over the fire or in a furnace. Always draw a chisel a little more in winter than in summer.

We have suggested hardening the chisel back very much further than is usual. The reason is that a chisel so made can be ground a great many times without redressing. Inasmuch as grinding is cheap and redressing is expensive, considerable loss can thereby be avoided.

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## Successful Lumber Yard Methods

*(Continued from page 110.)*

for storage, office complete, Mr. Tilden tackled the next problem and by no means the least important—delivery. He knew prompt, efficient delivery was the cornerstone of succesful lumber business and promptly put in operation four motor trucks, one one-ton, one ton-and-a-half and two two-ton capacities equipped with dump bodies, quickly available for hauling lumber, coal, gravel and cement. By the use of trailers he has been able to handle large quantities of material quickly. As a result he has built up a business famed for expeditious service. In fact, the quick response to orders even for large quantities is a perpetual but welcome surprise to customers accustomed to poor service.

President Tilden has a thoro working knowledge of the lumber and coal business, is a close student of all commercial methods, keeps posted upon all details of the business, motor delivery and other matters calculated to save money and promote efficiency and supplements the excellence of the plant with effective advertising. He knows the status of his business at all times, as well as being familiar with the status of his patrons and the condition of their account at a moment's notice, and extends to all patrons the highest grade of service, such as the most improved equipment and careful attention to even the smallest details, makes possible. The general efficiency is apparent to even the most casual observer. There is an air of alertness and energy that appears to be contagious and affects all. The business is operated with little friction and moves along in a well-oiled groove.


**You Are Requested and Urged to Make Free Use of These Columns for the Discusison of All Questions of Interest to the Building Industry**

## Solution for Cistern Problem

To the Editor: Los Angeles, Calif.

In answer to Mr. Holly H. Rickey's question in the October issue, I submit for his benefit, also anyone else that may be interested, the following rule:

To find the capacity of a cylindrical cistern, multiply the square of the diameter by .7854 and multiply the product by the depth, and this product by 7.48, the number of gallons in a cubic foot. For example: $10 \times 10 \times .7854 \times 20$ feet equals 1570.8058 cubic feet $\times$ 7.48 equals 11,749.58 gallons U. S.

H. J. Ackerman.

## Wants Information on Western Canada

To the Editor: Martinsburg, W. Va.

I would like to get some correct information regarding the opportunities for a good carpenter in western Canada, that is, in Alberta and neighboring provinces. I would like to know where I can get maps, pamphlets, etc. I don't intend to go there till next spring. Chas. A. Westenhaven.

## Wants Suggestion on Church Door

To the Editor: Hubbard, Ia.

Enclosed you will find photos of church in which we want to make some changes. As you will notice, there is a basement and lecture room entrance at about the same place. The church people want to enclose both the entrance to the basement and the entrance to the lecture room with a tower or some kind of an arrangement so they will be protected from the rain and snow.

We would like to see some sketches in the next issue of the American Builder showing how this change can be made.

Atkinson Lumber Co.

## Hardware Manufacturers—Can You Serve Him?

To the Editor: Madison, Mo.

I would like to get some information on cabinet hardware. I have a cabinet shop and make and repair all kinds of furniture and my great trouble is to secure the proper hardware for the work. Could you refer me to firms that can furnish this material? W. M. Palmer.

**Church Built Recently at Hubbard, Ia. Mr. Atkinson Wants Brother Readers to Submit Some Sketches Showing Best Arrangement for Protecting Entrance During Cold Weather.**

**Close-up View of Church Door Leading to Lecture Room and Basement. The Rector Wants to Enclose the Entrance to Protect the Rooms from Rain and Snow.**

## Can Use Designs of Log Cabins

To the Editor: Chicago, Ill.

Will you kindly advise me where I may secure a few scale drawings of log cabins?

I am making up some scenic effects to be used on a model railroad system and would like to include a few log cabins if I can secure sufficient information regarding a few styles.

I do not care for anything fancy. What I would appreciate most would be just a few plain designs which show the general dimensions.

H. M. Schlader.

SIMPLE ways of doing things are the best. When you discover a simple way of doing some necessary building operation, tell your fellow workers about it thru the Correspondence Department.

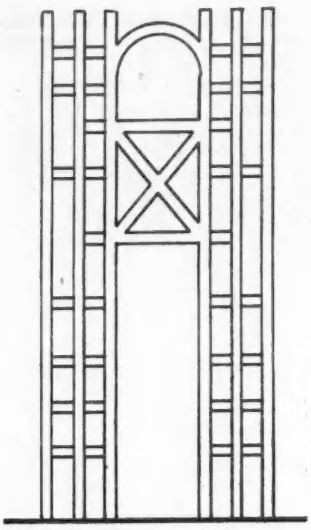


Fig. 1. Trellis Suitable for a Wall Corner of the House, the Side of a Front Porch, or Back Porch.

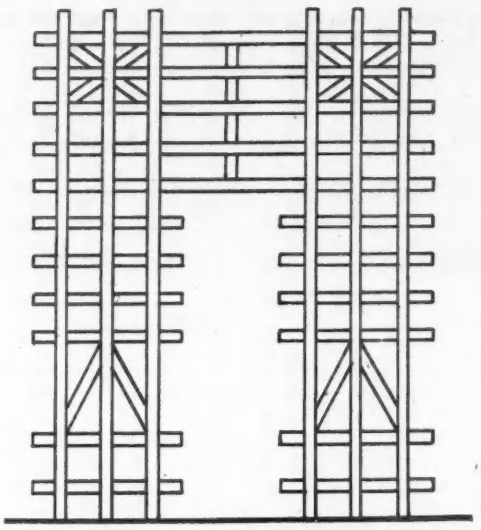


Fig. 2. Another Type of Trellis Which Is Used for Side Porch and in Front of House. An Eastern Builder Has Made a Success of This Kind of Work.

## Keeping the Shop Busy in Winter

To the Editor: Tonawanda, N. Y.

In winter time when building work is slack the busy builder-contractor is confronted with the problem of how to keep his shop in operation and give work to at least part of his men. Heretofore most of the shop work has been limited to making storm doors, storm windows or other odd work of similar nature.

With the increasing popularity of the bungalow type of houses there has been opened up to the building contractor a new source of profitable work. It also gives him an opportunity of using the odds and ends of material of all shapes that he may have lying around the shop. This work is making trellises and lattices. A few small samples of trellis handsomely painted in white or green, or a few photographs of residences showing how suitable trellis on the veranda or near the side windows has improved the appearance of the houses ought to be strong winning factors in making sales.

A builder situated in a large eastern city of several hundred thousand population, started the making of trellis work last winter. When spring came he was still far behind in orders; in fact, he abandoned the idea of building and now turns out trellis work exclusively. He makes all kinds of trellis and also works out special trellises. He charges 50 cents per square foot (outside measurement of the trellis) for stock of one inch or less, and 75c per square foot for thicker stock. He adds 10 cents per square foot for every quarter inch in thickness over one inch, this price including painting in either white or green, delivery and setting up.

Every new residence erected within the last 10 years in a locality is a prospective purchaser of some kind of trellis work if the matter is presented to them in the right manner. There is hardly a dwelling in any community in which attempts have not been made to beautify the exterior of the residence surroundings by means of shrubbery, trailing roses and vines of all varieties. All you have to do is convince or actually show the owner how much more beautiful the appearance of his home would be if decorated properly with trellis work and the job is yours.

Illustration No. 1 shows a type of trellis suitable for a wall corner of the house, the side of a front porch, or back porch. Illustration No. 2 shows a style of trellis suitable for the side porch or side of a house as well as front. Illustration No. 3 shows a type of trellis suitable for the front porch, especially where trailing plants are grown. This acts as a sunshade during the summer and changes the appearance of the house if painted handsomely in white.

RICHARD NEWBECKER.

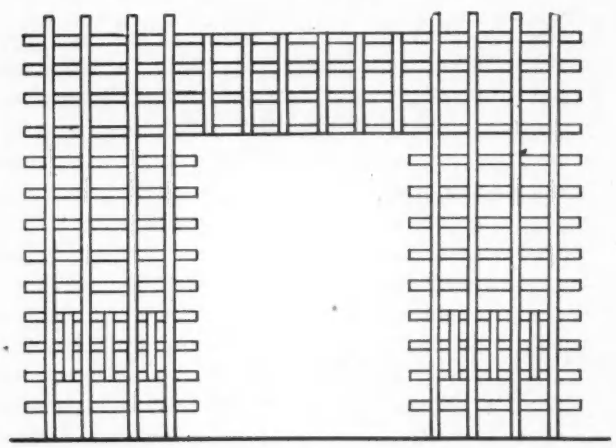


Fig. 3. Trellis for Front Porch or Wherever Climbing Plants Are Grown. During the Winter Months Builders, Suggests Mr. Newbecker, Can Use Their Spare Time by Making Trellis Work of This Kind.

## Here Are Two Puzzlers

To the Editor: Paso Robles, Calif.

Here are two problems for the boys to puzzle their brains on some dull time:

1. A white oak board is twice as large as a walnut board; ½ of the length of the white oak plus ¼ the length of the walnut equals the length of a maple board; ½ of the length of the maple divided by ½ the length of the walnut equals 10 feet.

One-third of the width of the white oak plus ¼ of the width of the walnut equals the width of the maple; ½ the width of the maple plus ½ the width of the walnut equals the width of the white oak; the width of maple plus ⅔ the width of white oak equals the width of walnut. One-half the width of walnut plus ½ the width of maple plus ⅔ the width of white oak equals 15 inches.

The walnut is ½ the thickness of the white oak thicker than the white oak, the maple is ⅓ the thickness of the walnut thicker than the walnut, ½ the thickness of the maple plus ⅔ the thickness of walnut plus the thickness of the white oak equals 3 inches.

What is the length of each board?

What is the width of each board?

What is the thickness of each board

What is the board feet of each board?

2. How large is a room that contains as many cubic feet of space as there are board feet in the walls enclosing it, if the walls are made of 1-inch lumber, counting ceiling and floor as walls, 6 walls in all, and the room is in shape of a cube?

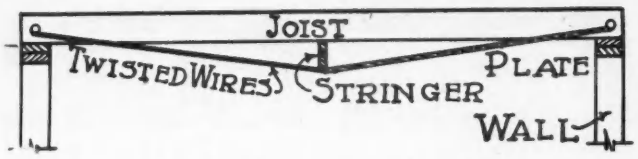
If you find room for these in the AMERICAN BUILDER I will send you the answers soon. These problems are original with myself.

F. C. GOODALE.

## Bracing an Upper Floor

To the Editor: Columbia, Mo.

In building a barn where it was desirable to eliminate a row of posts thru the center to support the upper joists wire trussing as shown in the illustration was used to support




**Wire Trussing Used in Barn Construction to Eliminate Posts.**

the upper floor. Not only was it satisfactory in supporting long joists, but also held up short joists spliced upon a stringer. A stringer of 2 by 12 lumber was laid from one end of the building to the other thru the center under the joists, and was held up by temporary posts. Then four strands of No. 10 wire were secured to each end of every joist, passing under the stringer in the center. When these wires were made perfectly tight by twisting a stick near the center, the floor was made to bulge upward a trifle in the middle, and was prevented from sagging by the strength of the wires. The principle is the same as that used in the construction of suspension bridges. H. F. GRIMSTEAD.

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## Answers Mr. Covey's Problem

To the Editor: Detroit, Mich.

AB = height of rafter.
BC = run of main rafter, 12".
BD = run of hip rafter, 17".
Draw line AC, then any line XY square to line AC will be

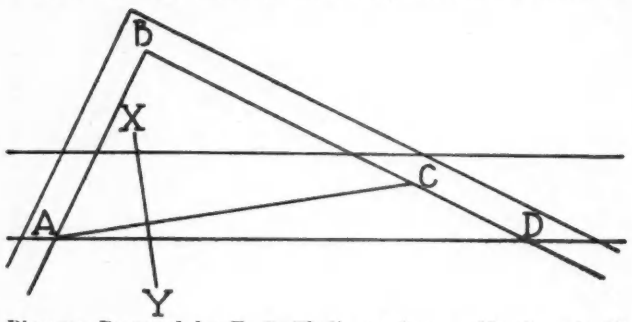



**Diagram Prepared by E. C. Thulin to Answer Mr. Covey's Hip Rafter Problem.**

cut of end of hip rafter to match a square cut on main rafter.

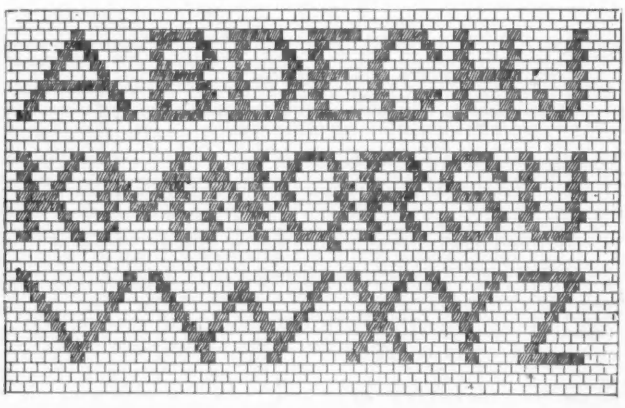
Above is reply to inquiry from William Covey in November issue of AMERICAN BUILDER. You will note in this solution the only figure that will be changed for different pitches is the length of line AB. E. C. THULIN.

✣

## A Shingling Alphabet

To the Editor: Sacramento, Calif.

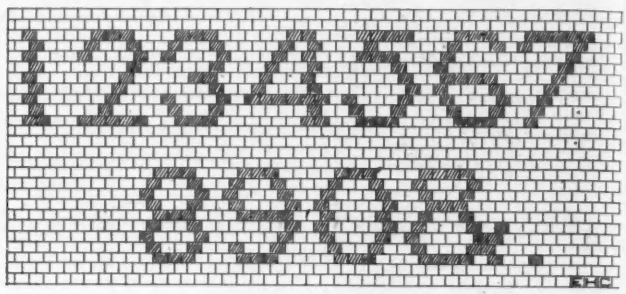
In the August issue of the AMERICAN BUILDER, I see a request from a correspondent for an alphabet suitable for forming a name in an asphalt shingle roof.



**Shingle Alphabet on Asphalt Shingle Roof as Designed by Edward H. Crussell. He Explains How Letters Can Be Formed.**

By means of the accompanying alphabet, and the use of shingles of a different color, names, dates or other data, may be worked into asphalt shingle roofs. The alphabet is also suitable for inscriptions in tile, or in brickwork. Those letters which are not shown may be easily formed from some of those that are; as the F from the E, the P from the R and so forth.

Before commencing to shingle work of this description, the workman will find it necessary to make an accurate scale drawing of the side of the roof in which the inscription is to appear. To block in the entire drawing with shingles would



**How the Numbers Can Be Shown on a Shingle Roof. This Is Made Possible by the Use of Different Colored Shingles.**

be a tedious task and is a needless one. Proceed as follows: on a sheet of paper, block out a rectangle representing the side of the roof to some convenient scale. On another piece of paper, mark out the inscription to the same scale, drawing only as many rows of shingles as will answer your purpose and taking care to leave plenty of space between separate words. Trim this second drawing to size, place it on the rectangle representing the roof, and adjust it into position. Measuring by scale from the inscription to the edges of the rectangle will show where the inscription should commence in the actual shingling.

When judging of the appearance of the lettering on the roof, the workman should tilt his drawing board to the pitch of the roof so as to approximate the effect of actual conditions.

EDWARD H. CRUSSELL.

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## Bracket Saw Designs Needed

To the Editor: Shell City, Mo.

Where can I secure bracket saw designs for scroll saw work? J. A. WELLS.

✣

## Want Manufacturers of Brass Handles

To the Editor:

I am interested in cast brass furniture handles. I would like to have the address of a company that manufacturs this kind of material so that I can get catalogues or pamphlets showing what styles they have. I have trouble in getting styles that I used to get. M. E. KLINE.

✣

## To Sell More Paint

THIS is the season of the year when people are beginning to think of putting away their screens and porch furniture. Before they are put away they really ought to be painted; it's real economy to do it.

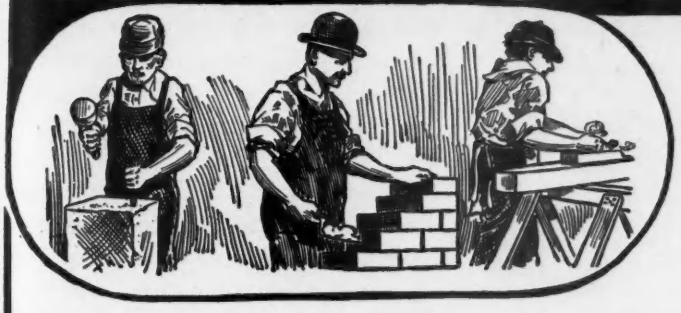
A good way for paint dealers to make people think of this is to take a window screen and a porch chair, paint one-half of each and put them in the store window.

Hang a window card near them reading:

"The painted side looks twice as well and will last twice as long. We sell the paint. Get your can now."

Paint dealers shouldn't expect people to think of these things themselves; they have their own business to think about, you know.

# What Is Your Job?



ARE you the man who is bossed—are you doing the hard work while some other man gets the high pay for telling you what to do? Why not be the boss yourself? The only difference between you and the men higher up is in what they know that you don't know. They get their big pay and have the easy work because they know how to direct you and other workmen. If you could read blue prints, estimate on work, know how to direct construction, you too would be in the big pay class. Read below how you can get this knowledge and be a bigger man in your line.

## Learn In Your Spare Time and Make More Money

At home—in your spare time—you can get instruction *by mail* from the experts of Chicago Technical College. You can learn all the higher branches of your trade and soon know as much or even a good deal more than the man who is bossing you now. If you are a workman, you can train for a foreman's or superintendent's job or you can look ahead to being a contractor in business for yourself. This training doesn't cost much and you can pay on easy terms. Look into this now. Just send the coupon below and get catalogs and full information.

### A Few Things We Teach

**PLAN READING**

How to read a building plan. Floor plans and elevations. Use and meaning of different lines on the plan. Sections and section lines. Cross Sections. How different materials are shown on the plan. How to read dimensions. Detail drawings. How to lay out work from the plans. Tracings and blue prints—how they are made. Practice in reading complete plans from basement to roof, etc., etc., etc.

**CONSTRUCTION**

**Brickwork:** Footings and foundation walls of brick, concrete and stone. Brick laying, joints in brick work, pointing, tuck pointing, etc. Brick and stone arches. Use of different kinds of stone.

**Carpentry:** Kinds and uses of woods, cornices, interior details, framing, roof construction, bridging, miter joints, butt joints, etc. How plans are made. Complete instructions illustrated by working blue prints. Plans and specifications. Residences, apartment buildings, factory buildings, school houses, hospitals, store and office buildings, bank buildings.

**ESTIMATING**

Practical rules. Problems worked out from the plans. Brickwork and carpentry. Excavations. Labor and material for footings in brick, concrete and rubble stone. Methods of practical builders. Re-inforced concrete—full plans and specifications for re-inforced concrete buildings. Estimates of labor and material required. Labor and material for brick work; figuring common and pressed brick walls of different thicknesses, etc. Chimneys, fire places and cisterns. Fireproofing, tile flooring, arches, partitions, furring, terra cotta, etc. Lumber and timber; figuring board feet. Estimating posts, girders, sills, joists, studs, bridging, rafters, etc. Estimating all kinds of roofs, floors, siding, cornices, etc. Labor for rough and finished carpentry.

Estimating mill work. Labor and material for window and door frames, sash, blinds, base board, wainscoating and all kinds of closets, cupboards, etc. Lathing and plastering, sheet metal work, exterior and interior marble jointing and decorating, glazing, plumbing, heating, wiring, etc.

**ARITHMETIC**

A complete but condensed course in arithmetic expressly arranged for contractors and builders. Teaches all a man in this business needs to know.

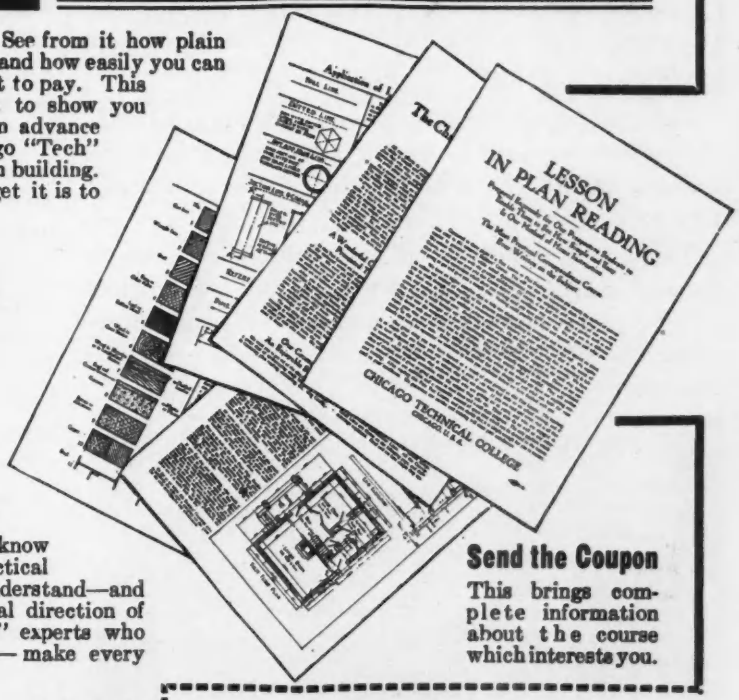
**ARCHITECTURE**

**COURSES IN DRAFTING**

We also offer complete home-study courses in Architectural and other branches of Drafting. If interested in any branch of Drafting, mention subject and ask for special catalog.

## FREE Lesson In Plan Reading

Get this *free lesson*. See from it how plain every point is made and how easily you can grasp it. Not a cent to pay. This lesson is free—sent to show you how quickly you can advance by taking a Chicago "Tech" home study course in building. All you need do to get it is to send the coupon.




## Complete Builders' Courses

Prepared and taught by experts. No useless theories. Just the practical things you want to know—told in simple, practical language. Easy to understand—and you have the personal direction of the Chicago "Tech" experts who explain everything—make every lesson clear to you.

**Send the Coupon**

This brings complete information about the course which interests you.

## *Learn by Mail*

You get all this training by mail and you study in spare time. Not an hour taken from your work. Keep on earning while you are learning—then step into bigger pay as a building expert—get paid for what you know.

***Sign and Mail the Coupon***

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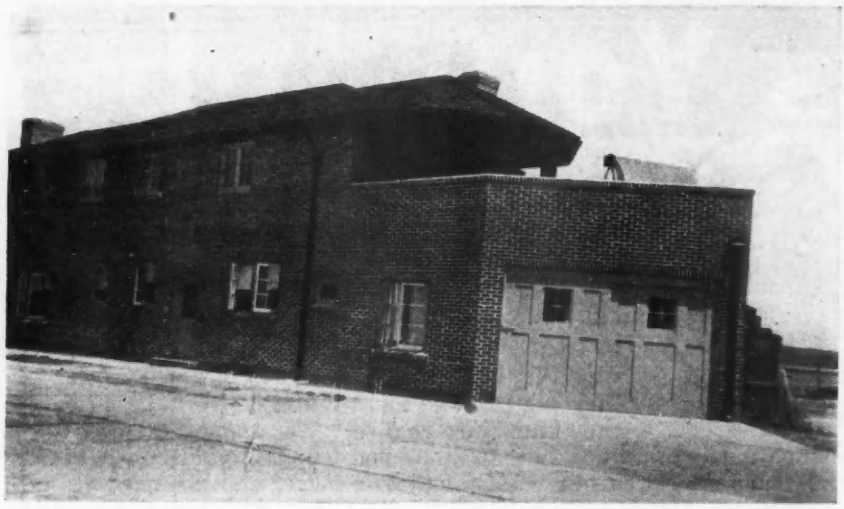
Send information on the course I have marked X below

☐ Plan Reading and Estimating ☐ Plumbing
☐ Heating and Ventilating ☐ Architectural Drafti..

Name.....
Address.....
Post Office.....State.....

If inquiry is for Plan Reading and Estimating, free lesson accompanies catalog



Unusually Shaped Brick House Built so Building and Garage Fits Into a Small Three-Cornered Lot with Pleasing Results. Walter Simon, Los Angeles, Cal., Brick Enthusiast, Designed and Built It. Note the Brick Shingles.

## Builds House with Brick Shingles

WALTER SIMON of Los Angeles is a believer in all things "brick." Naturally when he planned a new home he wanted to make it as near all "brick" as possible. And judging by the pictures shown here he has succeeded.

To do this he used something new in roofing material, called "brick shingles." This house roofed with brick, looks very much as if the wooden variety has been used, except that the roof appears a little thicker. Most of us are familiar with tile roofing and various other sorts, but brick shingles is a new one.

The shingles are formed of ordinary brick material and treated as bricks except that they are moulded thinner, as one of the illustrations shows. In a pile they look very much like slate.

The house proper is built of brick and is of an unusual shape. The architect has solved the problem of fitting the home and garage into a small three-cornered lot with very pleasing results.—Delphia Phillips.

Close-Up View of Pile of Brick Shingles Which Were Used in Simon Home. They Are Made of Clay Like Ordinary Brick But Molded Thinner.

## The Tire Problem

OF all possible abuses to solid motor truck tires, overloading is the most disastrous. Owners should make sure that their trucks are equipped with tires sufficiently large to take care of the greatest load their trucks will be subjected to. Trucks are frequently loaded so that heavy articles are piled up near the tailboard, while the fore part of the body carries little or nothing. In such cases the rear tires will be found to be carrying an overload, altho the total load is well within the truck's capacity.

✣

## How to Use the Steel Square

*(Continued from page 142.)*

cut clear the corner of plate, it is necessary to cut into the center line B. No. 2 cuts into the same point as No. 1, but owing to its being backed the seat cut drops accordingly. No. 3, which is for the unbacked valley, also cuts into the center vertical line, and in order to clear the edges of the plate, must cut out at the sides to the left vertical line. No. 4 cuts in the same depth as the latter, but as much lower than Nos. 2 and 3 as they are below No. 1. The vertical lines "A" and "C" from the plan represent the width of the rafter. A-B-C would be one inch apart, and this amount set off along the gauge point on the side of the rafter. To make this clearer, we refer to Fig. 7; 17 and 19 gives the seat cut. Now leaving the square rest as it is, measure back from 17 one-half the thickness of the rafter, which would locate the gauge point at 16, and this will be the point for the line from which to remove the wood back to the center line of the hip. The measurement from the gauge point taken square out from the seat cut to the edge of the rafter as shown at D-E, shows how far apart the parallel lines of the seat cut will be under the above conditions. This rule applies to any pitch given the roof so long as the pitches are regular.

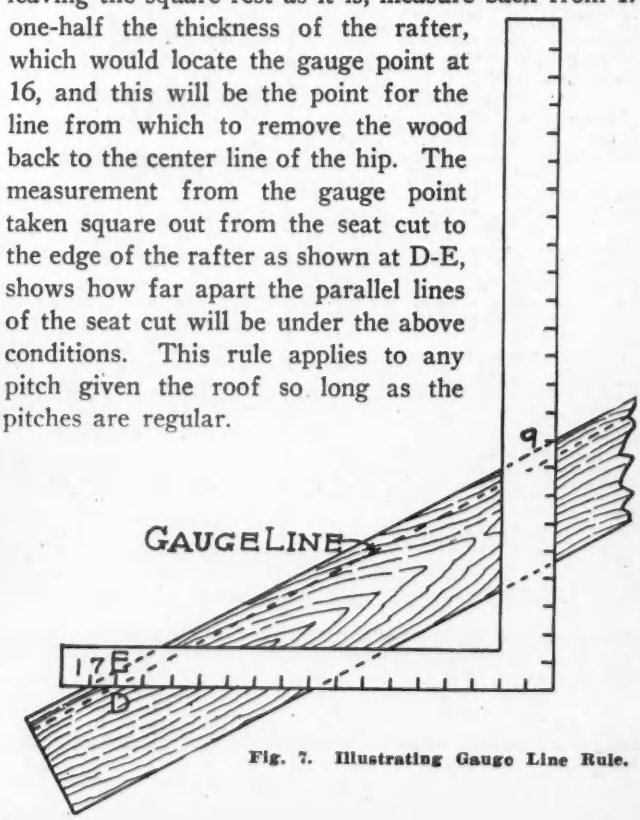
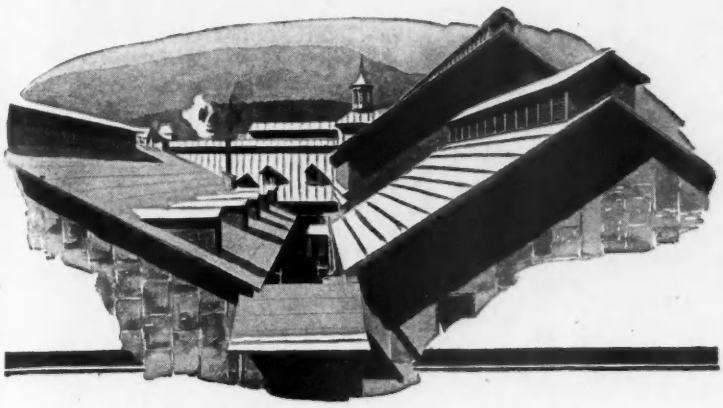



Fig. 7. Illustrating Gauge Line Rule.

# *Do you sell roofing— or just keep it for sale?*



*Union Tanning Co.*
*Cumberland, Md.*
*Roofed with Johns-Manville Asbestos Roofing*

JOHNS-MANVILLE Asbestos Roofing is more than an easily marketable product today—it is a product that is growing in sales value by leaps and bounds as more of your customers learn about it through our national advertising. It's a roofing you can always sell.

Johns-Manville Asbestos Roofing is unique in its marketable qualities because it is made of Asbestos. This fireproof mineral makes roofing that stands up for years under any climate. There's nothing else that even approaches it for durability and economy in service.

Through our national advertising we are telling millions about the durability and economy of Johns-Manville Asbestos Roofing.

And we back up Johns-Manville Asbestos roofing to *insure the complete performance* of the service promised.

Why not tie up your roofing business with our publicity and our policy, and thus handle the roofing that makes your customers come back for more? You'll get more repeat orders on a "service rendered" basis than any other way. And furthermore, you are protected in the sale of Johns-Manville Asbestos Roofings in a manner that makes a big difference in your profits.

Write to the nearest Johns-Manville Branch for the details of our trade policy.

If you sell roofing you can do better if it's Johns-Manville Asbestos Roofing.

*Johns-Manville Asbestos Roofings are approved by the Underwriters' Laboratories, Incorporated.*

H. W. JOHNS-MANVILLE CO.
Madison Avenue at 41st Street, New York City
*10 Factories—Branches in 63 Large Cities*
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JOHNS-MANVILLE SERVICE COVERS THE CONTINENT

*Through—*
**Asbestos**
and its allied products

JOHNS-MANVILLE
*Serves in Conservation*

Heat Insulations, High Temperature Cements, Asbestos Roofings, Packings, Brake Linings, Fire Prevention Products

# JOHNS-MANVILLE ASBESTOS ROOFING

# Handsome Well-Built Seven-Room Brick House

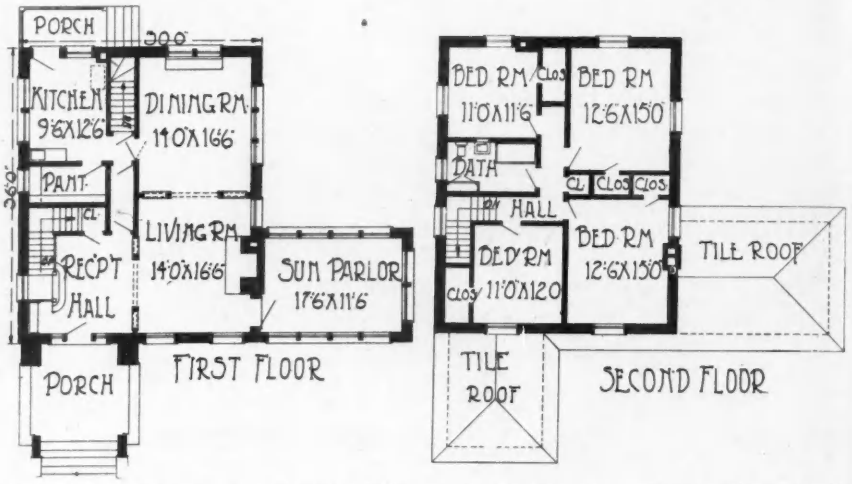
**HAS ATTRACTIVE HIP ROOF OF ORNAMENTAL TILE, LARGE SUN PARLOR AND IMPOSING FRONT PORCH**

THERE is something about the house shown here that gives the impression of bigness; yet a glance at the dimensions shows it is not large, being 36 feet long and 30 feet wide. The imposing appearance is due to careful construction and materials used. A tile roof always adds to the dignity of a home and brick gives it an appearance of strength. In this case both materials have been used with very satisfactory results. Brick in construction, this home is surmounted by an ornamental tile roof. Similar material is used as a roof for the porch and sun parlor. Stone trim is used thruout.

On the first floor are found three rooms and an excellent sun parlor with three side exposures affording an unusual amount of light and ventilation. This parlor is 17 feet 6 inches by 11 feet 6 inches and opens into the living room, 14 feet by 16 feet 6 inches. It has an open brick fireplace, and from three windows and the windows in the sun parlor receives an abundance of sunlight. Directly in rear of the living room is the dining room of identical size. In the far wall a window seat has been built.

The front door opens into a small reception hall which leads into the living room on the right and to the floor above. A small closet for outdoor clothes is provided at one end. This front hall also leads into a hall which opens in turn into the dining room and kitchen. The latter is small and complete with pantry in addition.

The second floor contains four bedrooms and bathroom. These sleeping rooms all have double exposure with large windows an essential feature in well constructed homes. They vary little in size, but are ample and well fitted with closets.




**Floor Plan Arrangement of Brick Residence. It Contains Seven Rooms, Three on the First Floor and Four Above.**

✣

TWO women are majoring in architecture in the University of Oregon. They are specializing in design and domestic architecture instead of construction work. This will lead to interior and exterior decorating, floor plans and structural design.

**Attractive Seven-Room Brick Home with Ornamental Tile Roof and "Sunshine" Sun Parlor. Sound in Construction, This Is an Ideal Home for the Man Who Builds to Last a Lifetime. Four Bedrooms Are on the Upper Floor.**

# BRICK
*(solid walls)*
# is the most economical building material

*moreover—*

*All St. Louis homes are built with solid Brick walls*

the Brick home is easiest to sell; is soonest paid for; lasts 100 years; always has highest market value; depreciates only 1 per cent annually after the first five years; is cheapest to heat; to alter; to maintain; it is fire-safe. Its beauty is permanent.

On the usual monthly payment plan a $9,000 Brick home is paid 7½ months sooner than an $8,500 "painted house".

THE COMMON BRICK INDUSTRY OF AMERICA
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Send $1.25 for two books—"BRICK, How to Build and Estimate," (25c), a practical manual containing detail architectural drawings and tables for computing quantities of material and labor cost; used as a text-book in 30 schools and colleges. And "BRICK for the Average Man's Home," ($1.00), containing 35 designs of modern Brick homes for which working drawings are available. *Both books sent postpaid for $1.25.*

Demand Brick with this Trade Mark
Your Guarantee of Quality

## *For* Beauty *with* Economy
## *build with* Common Brick

# Concrete Lumber on the Farm

PRECAST PRODUCT NOW BEING USED BY RURAL BUILDERS BECAUSE OF ECONOMY—HOW APPLIED ON SEPTIC TANK

**By Ivan D. Wood**

IN times past, it was thought that concrete work must be cast in place. When the mason wished to put a concrete lintel over the door, he put in an elaborate set of forms and cast the work in place. In many instances it is easier, cheaper and quicker to do the work on the ground and raise it in place afterwards. In the Forest Hills Gardens, a model city on Long Island, much of the concrete work was cast at the cement block plant and placed afterwards. Ornamental chimneys were raised into place with cranes; floor beams were raised in the same manner.

The farm concrete worker can often save himself time and labor by the use of pre-cast slabs. For instance, a friend of mine was constructing a septic tank recently. The roof of the tank must be 4 feet wide by 8 feet long. The mason advised that the roof must be a solid slab of concrete of this size and 4 inches thick. The weight of such a slab would be not less than 1,490 pounds. This is just a little too heavy to handle as a pre-cast slab, and so it was made in place by building a false, wooden floor supported on pieces of 2 by 4's laid like the stringers of an ordinary floor. These stringers were in turn supported by pieces of the same size acting as struts extending to the floor. The reinforcing was laid on this false floor and the concrete poured over it. The job was a strong one when completed, but more expensive than necessary. Then also it was necessary to furnish a man-hole in the top to get the form lumber out and provide a place for a man to enter the septic tank should it ever be necessary to clean it out.

The cheaper and better way would have been to have made concrete lumber and covered the tank with it. The lumber or pre-cast slabs as they are called, are simply reinforced pieces of concrete of a convenient size to handle. They can be laid in any position desired and can be removed if necessary. Let us see how my friend might have covered the septic tank with pre-cast slabs and have had a better job. Fig. 1 shows a view of the septic tank with one or two of the slabs in place. Each slab is 1 foot wide, 4 feet long, 4 inches thick and weighs 187 pounds. The form for casting the slabs is shown in Fig. 2. It is so made that by sliding out the wedges at "W," the side boards at "S" can be removed and the slab is ready to use after it has seasoned a few days. The reinforcing in the slab consists of two ⅜-inch rods laid 1¼ inch from the bottom of the slab. These pieces

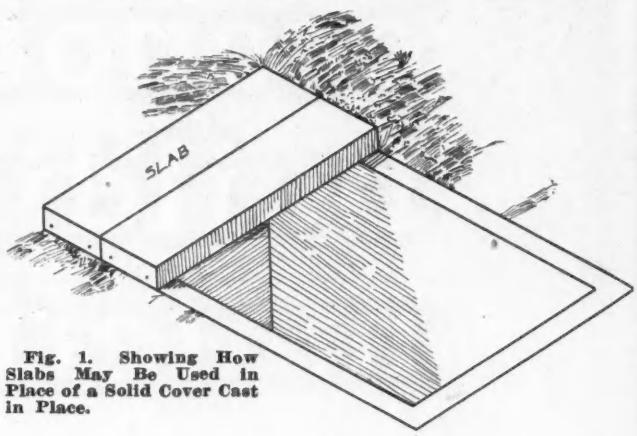



Fig. 1. Showing How Slabs May Be Used in Place of a Solid Cover Cast in Place.

of reinforcing are laid in the form after being cut to the proper length. They can be raised up and set on blocks until some of the concrete is worked in beneath them. The blocks are then removed and the form filled with concrete. These pre-cast slabs, after curing can be lifted into position easily and can be removed at any future time to permit of cleaning the tank. The expense of the false floor and the manhole are thus done away with; the job is just as strong and just as practical.

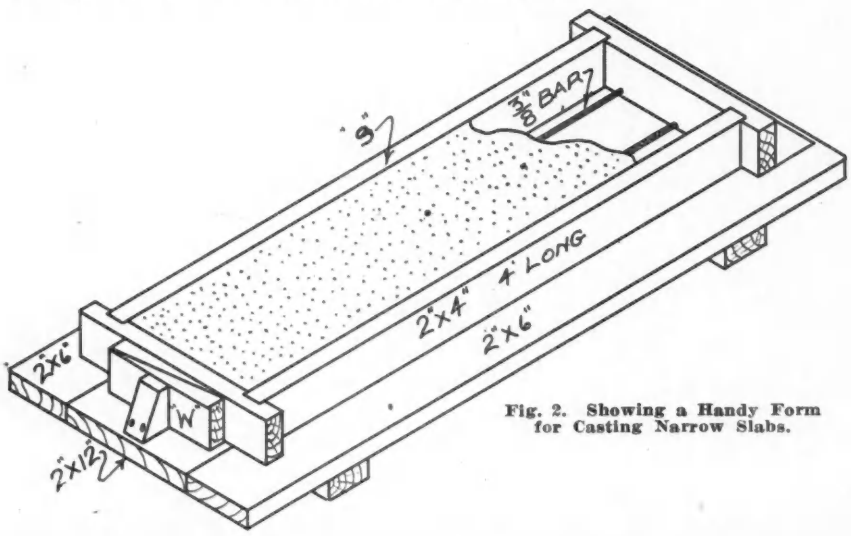



Fig. 2. Showing a Handy Form for Casting Narrow Slabs.

## Good Priming Coat Makes Good Paint Job

A RIMING coat usually pays for its cost. A firm base for the final coats is very essential to insure long service. The primer should be thin enough to penetrate the lumber; it should be well brushed in.

Only pure linseed oil or pure turpentine should be used to thin paint.

Altho frequently used, ochre is not a good primer. The primer should be of as good quality as the body coats, but reduced to the right consistency. Elbow grease is a very good thing to use on paint, especially the priming coat.


**EDITOR'S NOTE: The American Builder does not accept payment in any form for what appears in our reading pages. In order to avoid any appearance of doing so, we omit the name of the maker or seller of any article we describe. This information is, however, kept on file and will be mailed to anyone interested; address American Builder Information Exchange, 1827 Prairie Ave., Chicago.**

## Gas Hot Water Heater Operated on New Principle

ONE of the important features of the modern home is a year round hot water supply. Builders have found they can insure considerable satisfaction to their clients by specifying and installing a hot water heater that will take care of their needs. These heaters are operated in a variety of ways altho most of them are gas burning. Recently an innovation in gas burning water heaters was introduced.

**Gas Hot Water Heater Designed to Save Gas. It Is Heated by a Vertical Burner and Contains a Flat Copper Coil Instead of the Usual Round One.**

In this heater the water is heated by a vertical burner which is designed to be more economical in consumption of gas and not so liable to clog. The result is good combustion. A small copper coil is placed around the entire length of the burner. Instead of the usual round tube this coil is flattened and is placed in such a position that it comes in actual contact with the flame at the point of greatest heat. In this manner the water is heated instantaneously.

The mechanism of the new heater is very simple as shown in the illustration.

✣

## General Utility Clamp for Carpenters

CARPENTERS, cabinet makers, and joiners are continually doing work that requires the use of clamps. For that reason they will be particularly interested in a new utility clamp that is now available. It embodies several features, most important of which is the method of applying. As shown in the illustration, the screw is not placed above the bar as in most cases, but is attached to the upper edge of the bar itself.

The clamp is tightened by pulling the screw and bar thru the front casting. This helps to eliminate bending on the screw and practically all of the bar.

The bar is spring steel, tempered with round edges to fit the hand. The one hand handle is one of the prominent features of this clamp. This handle consists of two parts, the nut which fits on the screw and the forked handle which fits over the prongs on the nut. By this arrangement it can be swiveled to the most convenient position for applying pressure, and allows the clamp to be used squarely in a corner or other tight places where a solid handle could not be turned around. Because of the leverage provided one hand can provide plenty of pressure, leaving the other free to hold the material or hammer the joints.

**Utility Clamp for Cabinetmakers and Joiners with Special Handle. It Is Tightened by Pulling the Screw and Bar Thru the Front Casting.**

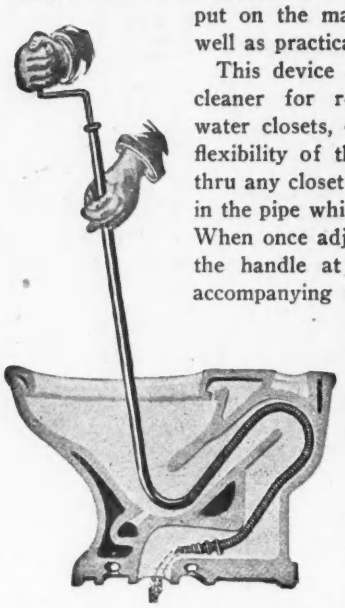
✣

## Unique Flexible Wire Closet Cleaner

ESPECIALLY important to builders, homeowners, in fact, any one who owns or builds a house is the sanitary upkeep and arrangement of the bathroom and closet fixtures.

**Corkscrew Arrangement at End of Flexible Wire Closet Cleaner. This Catches Any Obstruction Which May Be Lodged in Drain or Trap.**

Wonderful strides have been made in the development of sanitary specialties for keeping this important part of the home healthful and attractive. One of the devices recently put on the market is most interesting as well as practical.



**How New Closet Cleaner Is Operated. The Handle at the Top Operates the Corkscrew Arrangement at the End. It Is Made in 3 to 12 Foot Lengths.**

This device is a flexible coil wire closet cleaner for removing obstructions from water closets, drain pipes, traps, etc. The flexibility of this cleaner permits it to go thru any closet and bend around the curves in the pipe which make cleaning so difficult. When once adjusted in the closet or drain, the handle at the top, as shown in the accompanying illustration, is turned to the right, obstruction caught by the coil effect at the end and brought back to the opening by holding down on the tube and pulling back on the handle.

This device is made in different lengths of 3 to 12 feet.

✣

## New All-Multipedal Trenching Machine

CONTRACTORS will welcome a new type of trenching machine now being placed on the market.

The machine is designed to turn practically within its own radius and has full caterpillar traction.

The full multipedal traction steers thru heavy friction clutches—one on each side—its action in this respect being similar to the military tank. It is of sufficiently light weight to handle efficiently trenches for house connections, sewers, etc. The machine will cross sidewalks, climb over a curb, cross bridges and travel over any and all types of pavements, thereby reducing to a minimum the danger or damage claims.

A screw hoist raises and lowers the digging arm automatically, and the endless chain and buckets are of standard type. This screw hoist also acts effectively, because of its construction, as a lever to force the buckets to dig, by crowding the bucket line against the face of the ditch or cut.

A cleaning device takes care of the sticky dirt, and scrapes out each bucket as it passes a point at the head of the excavator boom, directly over the conveyor belt. This can be adjusted to deliver the excavated material to either side of the machine.

# FIBERCOTE STUCCO

## FIBERCOTE
## Magnesite-Asbestos
## STUCCO

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### GUARANTEED

**FIREPROOF—DAMPPROOF—WEATHER-PROOF—NON-CRACKING. LOW COST APPLICATION at any season of the year and in any climate, by any competent plasterer. Material is all one standard quality throughout, no inferior scratch coat is used. FIBERCOTE Stucco offers a variety of rarely beautiful finishes and is superior, in economy and durability, to any stucco on the market.**

**Immediate Deliveries Assured**

**Samples and price list upon request.**

**Cheney & Company, Inc.**

**112 W. 40th Street New York City**

# SAND'S

## For Carpenters, Millwrights and Mechanics

For twenty-five years Sand & Sons have been proud to place accurate levels in the hands of good workmen to safeguard reputation on every kind of work.

During all these years every piece of wood used in Sand's levels has been carefully selected from very old stock. Every piece has been air dried and seasoned in our factory for six months to a year before being made up. It is then made up entirely by hand and tested thoroughly before shipping.

These Sand's levels are tested repeatedly until the name SAND'S can be put upon them. When that name is placed upon the finished article it is thereby stamped as a level we are proud to sell—a level the most skillful workman is proud to own and use.

Sand's level accuracy means solidly set, absolutely true spirit glasses, with quick-acting bubbles.

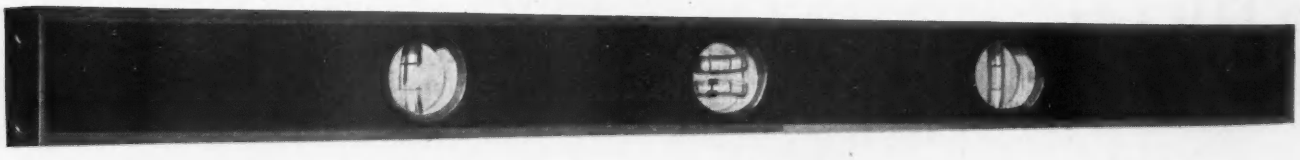
Sand's level accuracy means all spirit glasses protected by heavy plate glass lenses—dustproof, dirtproof, waterproof.

That's why good workmen have, for twenty-five years, shown preference for Sand's levels.

The pride of ownership that follows a Sand's level wherever it goes is a mark of the conscientious worker's appreciation for a fine appliance that enables him to do the finest work.

See these levels at your dealers—look over the aluminum levels originated by Sand.

See them with your own eyes—balance them in your own hands, give them every test you know. You will know then why one level is better than another—why you can well afford to inspect Sand's levels carefully.



# Ask Your Dealer For Sand's Levels

# LEVELS

## For Masons, Plasterers and Bricklayers

When your dealer shows you this splendid level, tilt it back and forth to see the quick-acting bubble. Note that the friction grip locaters stand out distinctly at each end of the bubble, defining exact center much more clearly than a mere scratch on the glass.

Try the Sand's level here and there to see how it shows plumb or level instantly.

Indeed, here is an accurate level, with reliance and accuracy built right into it. You can depend upon it as the very foundation of accuracy in any form of construction.

Inspect the full line of Sand's levels. Get just the one you want for your particular work. There is a Sand's level fitted to your every need. Buy your level as you would a chisel—for the kind of work you expect to use it on.

There are Sand's levels in pine or walnut. Some are plain and some are bound with non-rusting brass—not steel.

The number and arrangement of plumb and level glasses is varied for the requirements of profession and the work to be done.

There are, too, the aluminum levels, originated by Sand.

These are made in a heavy, milled, skeleton frame of 99 per cent pure aluminum. Their lightness makes them ideal for overhead work—for plumbing ceilings, shafting, beams or girders.

Hold a Sand's aluminum level as high as you can. Observe that it is always in position for use—that it plumbs any end up and levels any side up.

Remember in buying your level that—

Sands were the originators of this style of level.

Sands originated the walnut level.

Sands were the first to use plate glass lenses as protection for spirit glasses.

Sand originated and first applied the solid—set spirit glasses that require no adjustment and cannot get out of order unless dropped and broken.

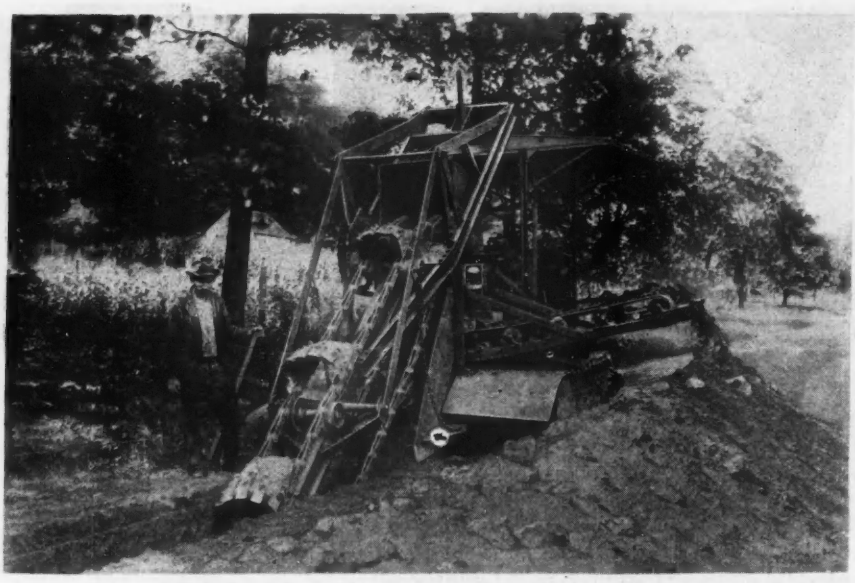
Sands first used wire, friction grip locaters at each end of the bubble to show exact center quickly and plainly.

Quite naturally, after originating these features, Sand & Sons can be depended upon to maintain their correctness in a measure not likely to be found in other levels.

The Sand's line contains just the level you want. Constant use by master workmen for twenty-five years has certified their accuracy. Ask your dealer for the genuine Sand's. Write for literature explaining all types, forms and sizes of accurate levels, for all workmen on every kind of work.


# J. Sand & Sons

## 4841 Rivard St., Detroit, Mich.



**New Trenching Machine Similar to Military Tank Designed to Dig Small Sewer Ditches, Etc., as Well as Heavier Work. It Digs Up to Six Feet in Depth.**

The illustration shows this new all-multipedal machine at work on trench excavation.

The gasoline engine is of 4 cyl. 4 cycle type, cooled by an enclosed radiator.

Some of the details which are of interest to sewer, water, gas, electric and oil pipe line contractors are as follows:

The digging width, with 18-in. buckets, will run from 20 to 28½ inches, and with 24-inch buckets, from 26½ to 29 inches. The standard boom will dig up to six feet in depth, altho the machine is substantial for service with an extensive equipment for digging eight feet deep. The traction accommodates itself to irregular surfaces, as the equipment consists of two oscillating multipedals. Each one of these multipedal tractions is driven independently of the other by a friction clutch, so that in turning in a confined space, one may be stopped while the other is going ahead, turning the machine practically within its own length.

The digging speed naturally depends upon conditions of the soil and the depth of trench, but the machine will dig at a phenomenal rate of speed.

The conveyor belt is reversible, so that it can deliver dirt on either side. Adjustable screws are provided for taking up the slack.

An important feature of the working performances is its easy interchangeability for digging trenches with vertical banks or small ditches with sloping sides.

✣

## Electric Outlet Provides for Future Requirements

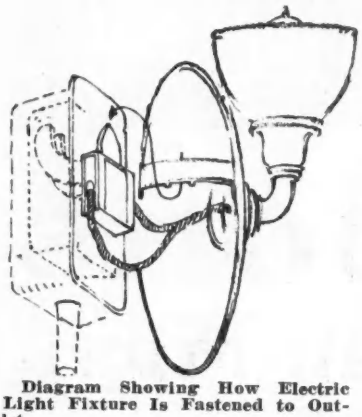


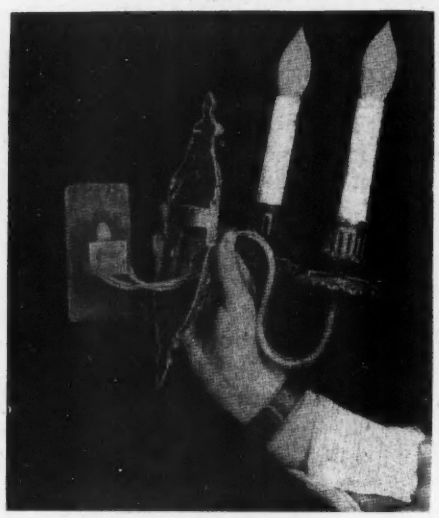
**Diagram Showing How Electric Light Fixture Is Fastened to Outlet.**

VERY often when building is occupied and furnished the fixtures are found to be sadly out of keeping with the decorations of the rooms. To relocate the fixtures entails considerable expense and much inconvenience. During the past few years some improvement has been made by the introduction of baseboard receptacles for attaching portables.

Recently a new type of electric outlet and lighting system has been developed which is designed to make it possible for the architect to locate and specify many more outlets at a nominal cost for installation than he has been able to do in the past, and by so doing to provide for unforeseen requirements for illumination, redecoration of rooms and expansions of lighting systems.

This supporting, finished outlet is installed at the time of wiring the building, to which lighting units and electric appliances may be connected as needed, or at will. It makes electric lighting flexible in that wall brackets and ceiling lights will become removable and readily installed at any outlet, an extra number of which suitably located will be installed.

For wall connections, these receptacles are small plates with two small parallel slots for the accommodation of the contact prongs of the connecting and supporting plugs. For ceiling use, the receptacles are similar flat plates round in shape or may be of the shallow saucer type, as best harmonizes with the decoration of the rooms.



**Another View of Fixture Being Adjusted. The Outlet Consists of Two Small Plates with Two Parallel Slots for Holding the Contact Prongs of the Connecting Plugs.**

The contact slots of the wall receptacles curve upward from the face of the receptacle plate, while in the case of the ceiling receptacles the slots curve away from one another and the surface of the receptacle plate—in opposite directions. The contact plug for the wall connections have parallel, upward curving, contact prongs. When the contact blades of the plug are inserted in the receptacle slots the connecting strap or base of the plug rests firmly and securely against the receptacle plate, unless raised to allow the withdrawal of the contacts by an upward swing.

In the method employed for supporting lights from ceiling receptacles the supporting plug is made with individual contact blades shaped like the letter "S," independently connected to the light sockets by suitable lead wires. These contact blades are inserted separately in the curved receptacle slots with hook-like ends projecting from the receptacles. The two hooks form a loop thru which the chain supporting the chandelier is passed.

**Supporting Lights from the Ceiling. The Contact Blades Are Shaped Like the Letter "S." These Are Inserted Separately in the Curved Receptacle Slots.**


# Special Offer To BUILDERS

Yes, I will give you this complete drawing outfit absolutely free. The instruments are in a handsome high class, plush lined folding case. They are regular draftsman's working instruments. Besides I will give you absobutely free, a 20x25 inch drawing board, a 24 inch T square, a 12 inch rule, a supply of drawing paper, two triangles, a French curve, pencils, erasers, thumb tacks, etc. The complete outfit is delivered to you at once. You have them to work with from the very first day. Find out about this offer. Write today.

## *Be a Draftsman*

### Draw $3,600 Per Year

There is an urgent demand for skilled draftsmen. Companies are issuing calls every day for men to fill positions paying $3,600 per year. Builders are peculiarly fitted to make big successes as expert draftsmen. Send the coupon now.

***Pay As You Wish*** What I want is the *right kind* of men. Don't bother about expense. I will give you the working outfit free if you get in at once. I charge a very small fee for training you to be an experienced draftsman. You can pay the small cost as suits you best.

## Chief Draftsman

### *Will Instruct You Personally*

I am Chief Draftsman of a large and well known firm. I know just the kind of training that is demanded from men who get big salaries. I want to train a limited number of builders to take big paying drafting positions. I train you by giving you actual, practical work, the kind that you must be able to do to hold permanent, high salaried jobs. I give you my individual instructions. If your work is right, I will advance you rapidly. If it is wrong, I will show you where and make you do it right, and do all I can to make you an expert draftsman and designer in a short time.

# Send Coupon for My Big New Book

Put your name and address on the coupon and send it to me today. I will send you my new book "Successful Draftsmanship," and the great special offer that I am now making on which you get the complete Draftsman's Working Outfit **absolutely free.** You assume no obligations of any kind in sending coupon. Get in line for a big paying position. Getting the book and full particulars of the special offer is the first step.

**Chief Draftsman Dobe,** Dept. 1659 4001 Broadway, Chicago, Ill.

**Chief Draftsman Dobe**
**Dept. 1659, 4001 Broadway, Chicago, Ill.**

Without any obligations on me whatsoever, please mail your book "Successful Draftsmanship," and full particulars of your liberal "Personal Instruction" offer to Builders. It is understood that I am obligated in no way whatever.

*Name*.....

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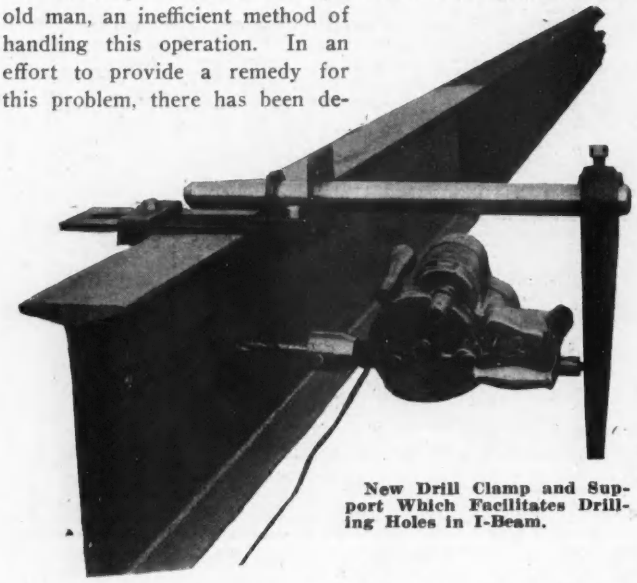
*Post Office*.....*State*.....

## New Drill Clamp and Support Speed Up Drilling

ONE of the troublesome jobs for builders working on I beams is drilling holes. Heretofore this work has been done by what is commonly known as the gooseneck or old man, an inefficient method of handling this operation. In an effort to provide a remedy for this problem, there has been devised a drill clamp and support. With one adjustment any number of holes can be drilled in the top, bottom, or web of the I beam. These drills are being used extensively by construction companies and builders. They find they can drill 16 holes in an I beam as quickly as they can drill one with the old man or gooseneck.



**New Drill Clamp and Support Which Facilitates Drilling Holes in I-Beam.**

✣

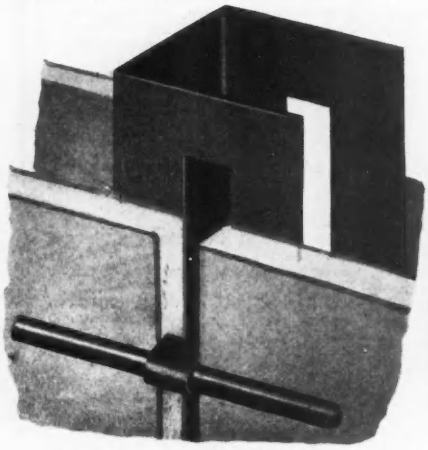
## New Partition and Ceiling Construction

THE erection or fire-proof ceilings and sound-proof non-bearing partitions in which plaster board is mounted on steel studs is used quite extensively. A new arrangement has been devised for this kind of construction, the feature of which is the method by which the plaster boards are fastened to the studs.

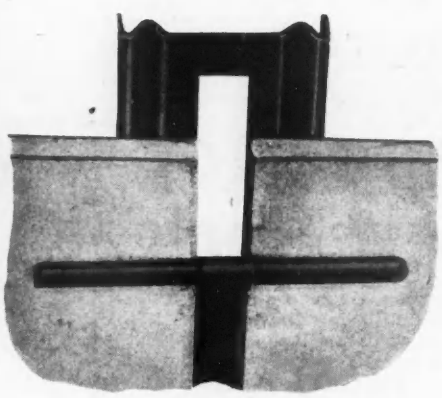
This system calls for 22 and 24 gauge sheet steel studs to be used either in solid or hollow partitions. The hollow partition stud has a flat shoulder ½ inch wide, as shown in the illustration. This shoulder rests flat against the wall board allowing a maximum air space between the wall faces. The solid partition, also shown here, is finished with double V construction to give it exceptional strength and rigidity.

The important part of the system, however, is the tie, a die-cut tongue every three inches along the stud which is bent out from the stud and then back to tie with a strong tension around the pin binding the plaster boards securely in place. This method of pinning automatically adjusts itself to any variations in the thickness of the plaster boards and leaves little metal to protrude above the surface at 6-inch intervals to be covered over with plaster. As the tongue is bent up it leaves a 1½ by ⅜ slot for a plaster key.

The tying tool is used for clinching the tongue over the pin and completes the operation quickly. A claw slips thru the slot and over the edge of the tongue. A downward motion turns this tongue out at right angles. A pin is then slipped behind it and the tongue lapped securely over the pin by means of the tying tool. The pin is made of straight 3-inch number 10 wire which will lie flat on the plaster board. Right angle pins are used for corner construction.



**Hollow Partition Stud. Plaster Board Is Mounted on the Steel Stud Shown Here and Fastened by a Tongue or Tie. A Special Tying Tool Is Used to Clinch This Tongue Over the Pin.**

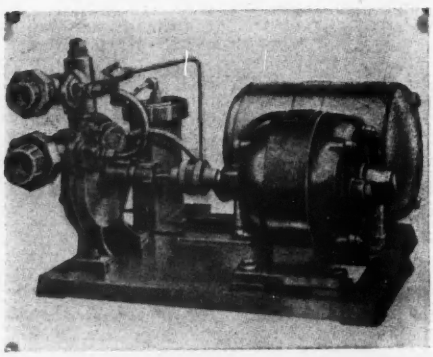


**Solid Partition Stud. It Is Finished with Double V Construction to Give it Strength. This Wall Construction Is Used in Many of the New Fire-Proof Structures.**

✣

## Tankless Water Supply System

A WATER supply system without a tank—that is the feature of one of the systems now being installed by many contractors in farm houses. The entire equipment consists of a pump, motor, automatic electric control switch, compression chamber and some fittings. Naturally the installation is simple; the suction pipe is first connected from the pump to well, cistern or other source of supply, then the discharge pipe is connected from the pump to the service line, and the connecting up of the electric wires with the motor completes the job.



**Tankless Water Supply System. It Consists of a Pump, Motor, Automatic Electric Switch and Compression Chamber. As Soon as the Faucet Is Opened the Water Is Pumped Direct from the Well.**

When the faucet is opened the motor starts and water is pumped direct from the well. When the faucet is closed the pump stops. This is accomplished by the electric control switch.

For ordinary purposes such as supplying water for laundry, bathroom and kitchen, a one-quarter horsepower motor is sufficient. If the needs are greater a larger system is installed. It is used extensively for soft water service in the city where independent water supply service is desired and current is available.

This system is either operated by regular station service of 110 or 220 volt or a 32-volt electric lighting plant.

✣

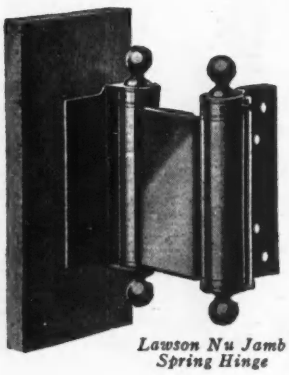
FIFTY THOUSAND men, all trained in one profession, is a large advisory board for anyone to have to consult when necessary. Many more men than that read the AMERICAN BUILDER each month, and thru the Correspondence Department they may be consulted about any question concerning building that may arise. When in doubt about a building method, send an inquiry to the Correspondence Department.

✣

IF a thing will save and make money for you now and is worth buying at all, it is worth buying now.

# THERE IS A LAWSON THAT WAS MADE F

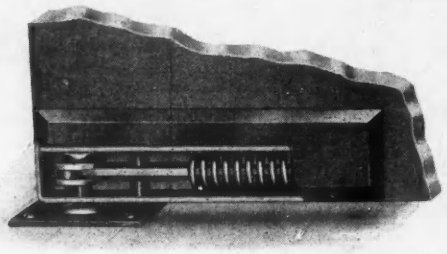
WHETHER it is a pair of French doors in a $50,000 residence or a heavy factory double-swing door, you will find a Lawson Spring Hinge that is made to give the best possible service for that particular job. And certain special features, to be found only in Lawson Hinges, give them definite practical advantages very important to the architect and builder.



*Lawson Nu Jamb Spring Hinge*

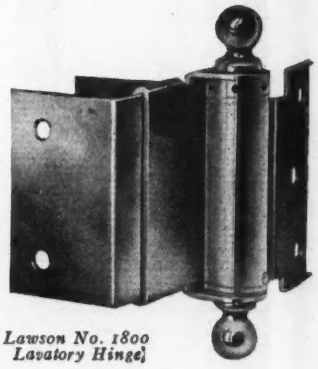
The Lawson Nu Jamb Spring Hinge, for instance, can be applied directly to the jamb without the use of a hanging strip. This means *a saving of at least $1.50 in labor and material* on every door you hang, and a better looking job with more solid support.

The lightest floor hinge on the market is Lawson's No. 800 Floor Hinge. Because it is *constructed scientifically*, strength where strength is needed, friction eliminated where the wear comes, this light construction is combined with greater strength and longer service. The square reversible side plates often save time and money, as in cases where there are slight alterations in the plans after the hardware is at the job.



*Lawson No. 800 Floor Hinge*

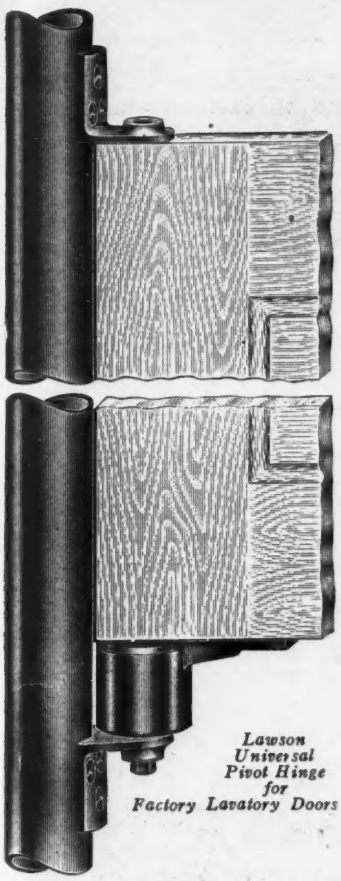
The hanging of toilet and lavatory doors has been greatly improved by the Lawson method of using two 3-inch spring hinges instead of the old 4-inch hinge and blank.



*Lawson No. 1800 Lavatory Hinge*

LAWSON

# SPRING HINGE FOR YOUR JOB

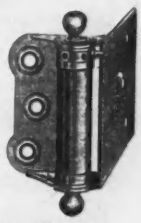


*Lawson Universal Pivot Hinge for Factory Lavatory Doors*

For office gates, Lawson Universal Pivot Spring Hinges provide absolutely non-sagging support, and can be adjusted *after installation*, to any alignment, either right or left hand swing. Made also in styles suitable for factory lavatory doors.

These are only a few of the complete Lawson line, which includes all sizes and styles of spring hinges and springs for residence, office and factory doors, gates, etc.

No. 400



No. 450

*Lawson Screen Door Hinges*

Builders everywhere are enthusiastic over the economy, appearance and durability of jobs where they are used.

*Send for the new Lawson catalog. It is beautifully illustrated and shows the latest developments in the construction and use of spring hinges. No up-to-date builder can afford to be without it. Write today.*

## LAWSON MANUFACTURING CO.

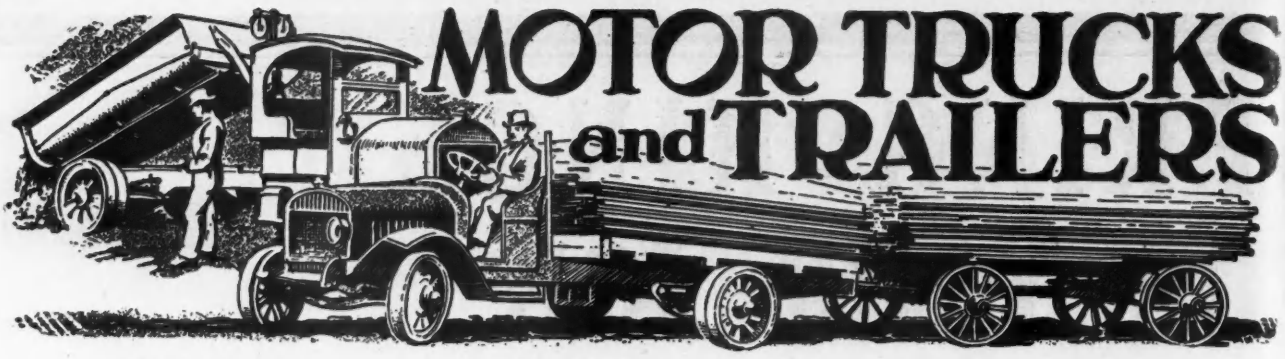
Department 7829

230 W. Superior Street CHICAGO, ILLINOIS

*Eastern Representative*
*JOHN H. GRAHAM & CO.*
*113 Chambers Street 95 Reade Street*
*New York City*

*Pacific Coast Representatives*
*C. N. & F. W. JONAS*
*San Francisco Los Angeles*
*Seattle*

# LAWSON




# The Influence of Highway Transportation

MOTOR TRUCKS TAKE CARE OF SHORT HAULS AND ARE EFFICIENT AID TO RAILROADS

**By S. R. Swiss**

TRANSPORTATION is as old as time and may properly be coupled with man's existence from the very beginning.

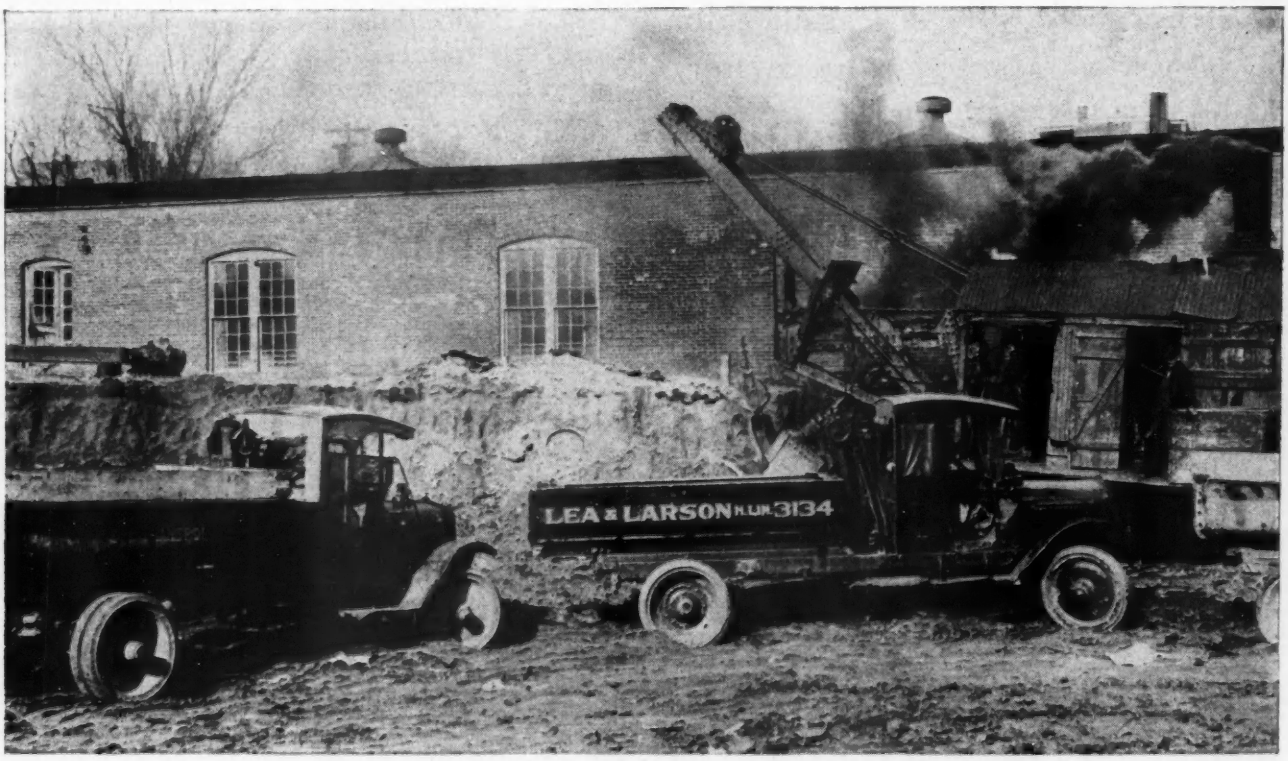
It is not the purpose to here enlarge upon the various stages of development thru which the course of transportation has passed, for that would entail lengthy discussion of peoples and eras since the birth of man.

Coming down to modern times, we find that the influence of transportation has left its most definite mark upon our destinies within the past five years. The Great War found possibly two European nations in possession of practical, worthwhile public highways. The other European countries found themselves in possession of ancient highways which had never been developed or enlarged to meet extraordinary requirements.

The war had not been in progress a year before the stupendous realization struck home that without more and better highways there could be little hope of defense and less of possible victory. Immediately the warring nations set themselves to the task of building more and better highways to facilitate passage of troops and supplies from rearward areas to fighting fronts.

With America's entry came the greatest forward step in the matter of road-building and general highway development thruout the war-scarred countries. While America cannot claim distinction for the surpassing excellence of its highways, nevertheless American methods were employed overseas, roads and highways widened, new ones built, with typical Yankee speed.

The war over, economic conditions thruout the world had to be readjusted. It was soon apparent that old and antiquated transportation methods could no longer be tolerated. This was manifestly true in each and every country in the world. Everywhere was spread the message that before productivity and sta-




**Every Time One of These 3½-Ton "Republic" Trucks Leaves This Job It Carries Away 3 Cubic Yards of Dirt. Motor Trucks Equipped with Hydraulic Hoists Have Revolutionized Excavation Work and Cut the Expense Considerably. With Just a Little Care and Plenty of Fuel They Prove Untiring Workers.**

# DUPLEX TRUCKS

BUILT FOR BUSINESS

## The Duplex 4-Wheel Drive Truck Is the Most Efficient Trucking Unit Ever Designed for Heavy Duty

***It Stands to Reason, Too—When You Think of Its Advantages—That This Truck Should Prove to Be the Most Economical Heavy Duty Transportation Unit***

THE picture herewith shows the Duplex 4-Wheel Drive Truck owned by the Stewart Construction Company, Chicago, traveling from Denver, Colo., to Broadmoor—80 miles—with a six ton concrete mixer loaded on the truck and trailer.

The railroad asked $58 freight, the company to load and unload the machine on the cars at an additional cost of $25, total cost $83.

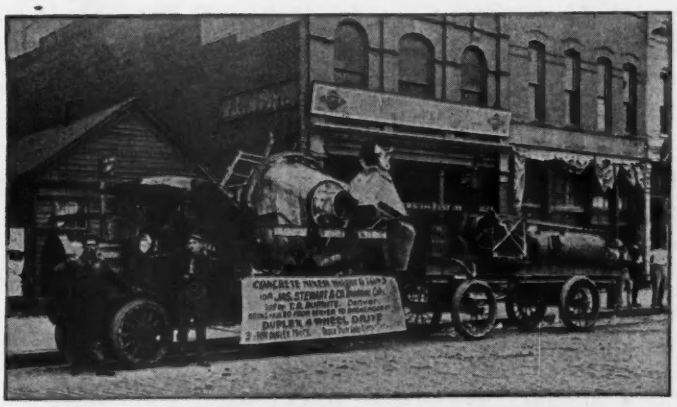
The Duplex Truck delivered the load for the total cost of $23.83, including the driver's time.

The trip was completed in eleven hours over gumbo roads and through a hail and rain storm.

You know and we know that consistent truck performance is never an accident—but that it is due to something a great deal more solid than salesmen's arguments or paper specifications.

The Scientific American Magazine says that four driving wheels "utilize" the entire weight of the truck.

Have you ever stopped to figure that a steam locomotive never uses less than four drivers? The same reasons that make this principle efficient in locomotives makes it true in this wonderful Duplex 4-Wheel Drive Truck—America's road locomotive.




### Here Are Some of the Reasons Why the Duplex 4-Wheel Drive Is the Best Truck Ever Made for Contractors' and Builders' Use

Every wheel is a **drive** wheel—the power application is continuous and even. There is no inertia or "dead" resistance to overcome.

This may be a new principle to you—but the first Duplex 4-Wheel Drive Trucks were made ten years ago and are **running yet.** It is a mathematical and engineering principle that four driving wheels will do three times as much as two driving wheels. Think a moment and you can figure this for yourself.

This means that the Duplex 4-Wheel Drive Truck will not slip the wheels, burn the tires and waste gasoline.

It reduces the strain on working parts by **equalizing** the strain—reduces repair bills and lost time.

The Duplex 4-Wheel Drive will take a load over roads and into places where no two-wheel drive truck can go, no matter how good that truck may be.

### Don't Experiment With Trucks Any Longer—

### Buy the Proven Truck

Get a demonstration of the Duplex 4-Wheel Drive. Your truck purchase represents a big outlay.

You owe it to yourself and to the welfare of your own business to see that this investment is wisely made—that it is a practical investment and a paying investment.

Go to the Duplex dealer near you. Let him prove this wonderful truck to you under real operating conditions.

Pitted against any other truck of any other make that you know of or that you feel is a good truck and on the basis of its superior performance, you will find the Duplex the superior unit.

The Duplex 4-Wheel Drive Truck is 3½ ton capacity and it sells for $4,250, F. O. B. Lansing, and is a **real business truck—and it is worth every dollar of it.**

If you use medium capacity high speed trucks at all—then by all means take the time to look over the Duplex Limited—Medium Capacity, Pneumatic Tires, Full Electrical Equipment, High Speed—$2,775 F. O. B. Lansing.

This is the truck that recently ran for twenty-four hours consecutively, 935 miles, without a stop—a world's record.

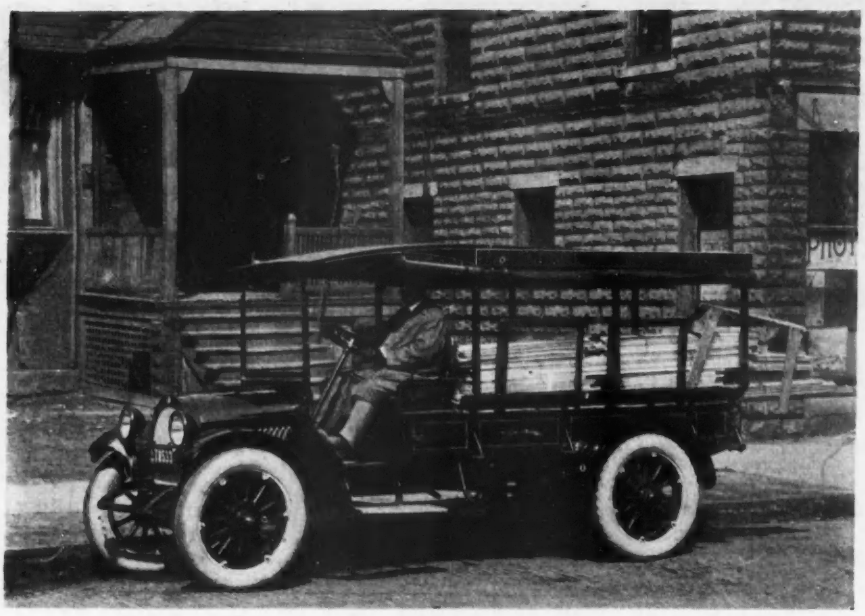
DUPLEX BUILT FOR BUSINESS

**Duplex Truck Company**

**Lansing · Michigan**

*One of the Oldest and Most Successful Truck Companies in America*

DUPLEX BUILT FOR BUSINESS



**Many Contractors Need a Light Speedy Truck to Make Quick Hauls in Case Supplies Run Short at a Critical Time. Frank S. Kittinger, General Contractor, Has This "Oldsmobile" for That Purpose and Finds It an Excellent Aid in His Work. The Pneumatic Tires Are a Great Help in Speed.**

bility could be regained one of the first requirements would be to improve and increase transportation facilities.

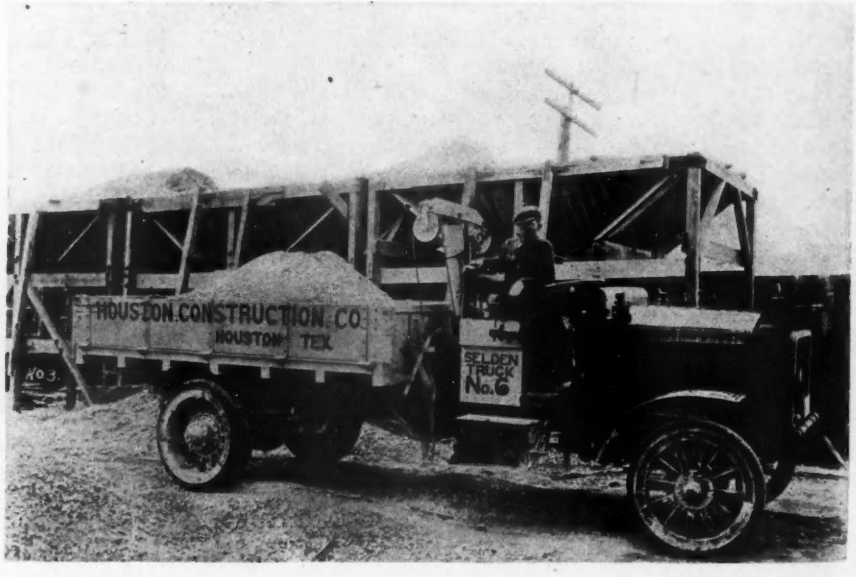
Applying this thought to America, we find that the various states have authorized by legislative enactment or direct voice of their citizens, the stupendous total of well over one billion dollars to build and improve pubic highways thruout the country. This sum is huge and inspiring. Several years will be required to carry out the enormous program. The economic benefits to be derived, while not calculable in dollars and cents, will undoubtedly be worth many times the cost. And as a national asset the value of America's Highway System of the near future will be beyond computation.

Transportation is the vital blood stream of commerce. It affects the production. distribution and price of every commodity. The importance of transportation cannot be over-estimated. But it is a fact that the importance of this agency is not apparent to the larger portion of the human family. We overlook its marvelous workings and coolly accept the things and advantages which transportation places within our grasp; possibly because transportation is one of the agencies which man first learned to employ.

Suppose for a moment that all transportation were s u d d e n l y stopped and forever removed. Such a condition is inconceivable and if it occurred complete and utter stagnation would surely follow. Without the help of mighty transportation all values would disappear; peoples would become isolated; races would soon disappear; exchange of intelligence and news would be paralyzed; barter and trade, the sciences, language, everything would suspend! Mines might still contain coal and minerals; from wells come endless streams of oil; vast forests would still grow unlimited timber; upon fields grow plenteous crops; the sea would still contain its endless supply of food. Yet, all this bounty would lie inert and be utterly worthless without transportation, the agency which imparts value to all things and places the world's fruits within the grasp of men.

From the earliest period the main channel of transportation was the open road or highway. Then came water highways; then followed the railroads with their marvelous steel ribbons reaching from point to point. Today we know that highways exert greater influence as channels of transportation than any or all of the others combined. Upon the development of roads and highways rests the future prosperity and development of the nations.

The development of public roads in America is being conducted on a larger scale than has ever been attempted by any nation since the beginning of time. In this road development lies the future history of the motor truck. During and since the Great War the modern motor truck was proven the logical companion to the highway. Faster and more dependable than animal draft power, motor trucks have revealed that roads and highways are the most important connecting




**Down in Houston, Texas, There Is a Busy Building Firm Called the Houston Construction Co. One of the Reasons for This Activity Is Shown Here. They Maintain a Fleet of Heavy Duty "Selden" Trucks for Hauling Big Loads of Gravel and Other Building Material.**

# THE ROMORT AIR & WATER STATION

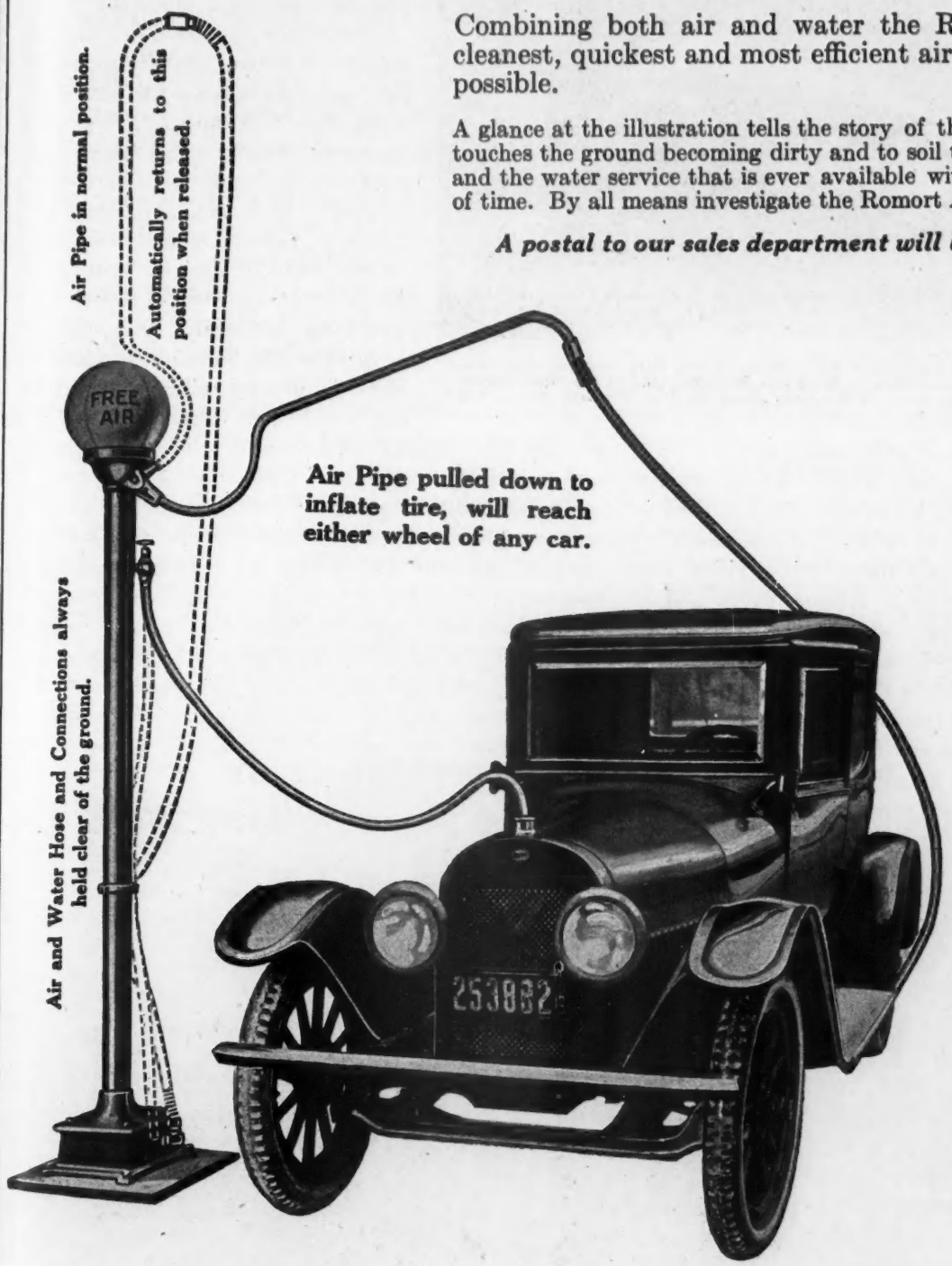
## ARE YOU PLANNING A GARAGE OR FILLING STATION?

Have you considered the great importance of an efficient tire air and radiator water service?

Combining both air and water the Romort renders the cleanest, quickest and most efficient air and water service possible.

A glance at the illustration tells the story of the air hose that never touches the ground becoming dirty and to soil the hands and clothing and the water service that is ever available without trouble and loss of time. By all means investigate the Romort Air and Water Station.

***A postal to our sales department will bring full details***




MANUFACTURERS
**The Romort Mfg. Co.**
OAKFIELD, WIS.

SALES DEPT.
**The Zinke Co.**
1323 MICHIGAN AVE.
CHICAGO ILLINOIS

Mr. Plummer, Excavation Contractor, Minneapolis, Minn., Says This 3½-Ton "Acme" Does the Work of Seven Teams. Here It Is Shown Dumping One of the Many Loads of Dirt It Carries Every Working Day. It Averages About 90 Miles Per Day Over a Loose, Sandy Road.

links between cities, towns and countries.

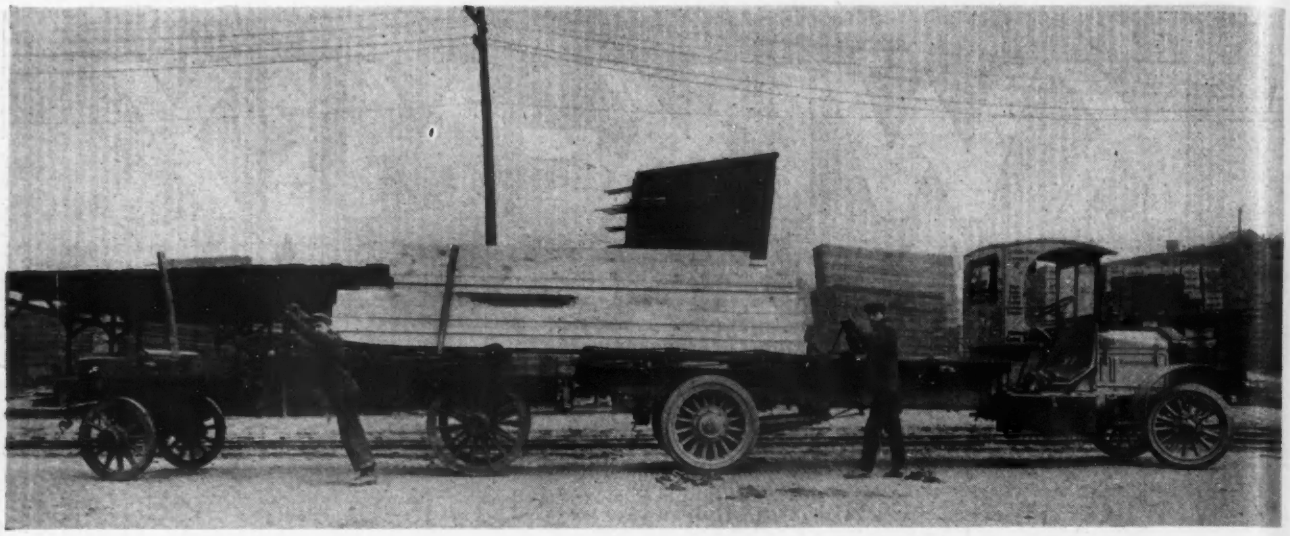
In America motor transportation has been brought to high development and its influence is felt even in every remote hamlet. Hundreds of thousands of motor trucks ply daily upon the streets of cities, over principal highways leading to distant places, and in effect serve to connect the whole country as one huge network of avenues. These motor trucks are bringing the produce raised on farms direct to consuming and selling centers; they are reducing shipping delays, preventing spoilage of crops and foods; and, by lessening waste of time between production and consumption are aiding materially in the problem of lowering costs.

Countries in Europe, Asia, Africa and South America have learned that the motor truck provides a ready and satisfactory solution of most internal transportation problems. The adoption of motor trucks thruout the world is growing apace and with the installation of efficient service facilities everywhere the future of motor transportation becomes more and more assured.

Motor trucks in certain sections of the United States have been operated with such success and economy as to become recognized competitors of the railroads in transporting freight and even passenger cargoes. On this point there is likelihood of misunderstanding. Those who have studied motor transportation and watched its development in America give little credence to the theory that trucks will successfully compete with railroads over any but comparatively short distances. Just what the limit of this distance is cannot as yet be determined, but, broadly speaking, it does not seem reasonable at this time to expect motor trucks to successfully compete with railroads over distances of more than 100 miles. Numerous instances can be cited where on distances exceeding this figure motor trucks have actually outstripped railroads, both in efficiency of service as well as financial economy. However, motor trucks were not developed primarily to compete with railroads, but rather to assist them in moving millions of small loads over short distances, in which service the railroads have proven lack of equipment and facility.

There is a definite place for both railroads and motor trucks. The possibilities of either one should not be confused with those of the other. It is inconceivable that motor transportation can ever attain the magnitude or embrace the scope of railroads on long hauls. Likewise, it is inconceivable that railroads will ever tap the myriads of small towns and hamlets which are at present removed from their immediate presence and influence, but over which motor transportation wields a powerful and helpful force.

Ten-Ton "Highway" Trailer Loaded with 13,000 Feet of Hemlock Being Pulled by a Seven-Ton "Sterling" Truck. This Is One of the Important Units in Use by the Heddles Lumber Co., Madison, Wis.



Speeding Up the Work in the Lumber Yard. Transferring This Load of Lumber from the Trailer to the "Pierce-Arrow" Truck Is Only a Matter of Minutes Because of the Special Loading Device. Trucks and Trailers Have Been Factors in Building Up Many Lumber Concerns Because They Increase Hauling Capacity and Radius.

## Clean Your Crank Case

WITH the approach of cold weather it is well to remember that the temperature may drop below the freezing point at any time. This sometimes happens during the night without any apparent warning.

If your truck is not housed in a warm garage at night, be on the safe side and drain the water from the radiator and cylinders. This should be done regularly every night after there is danger of frost. If it is neglected one night this may be just the night when the damage will occur.

After continued cold weather a non-freezing solution should be used. The following mixture of either wood alcohol or denatured alcohol is recommended:

For zero weather use—Water 75 per cent, alcohol 25 per cent.

For ten below zero—Water 70 per cent, alcohol 30 per cent.

For twenty below zero—Water 60 per cent, alcohol 40 per cent.

The use of glycerine raises the boiling point of solution. It is more expensive than alcohol and is slightly injurious to rubber. All things considered, a combination solution of alcohol and glycerine in water is satisfactory.

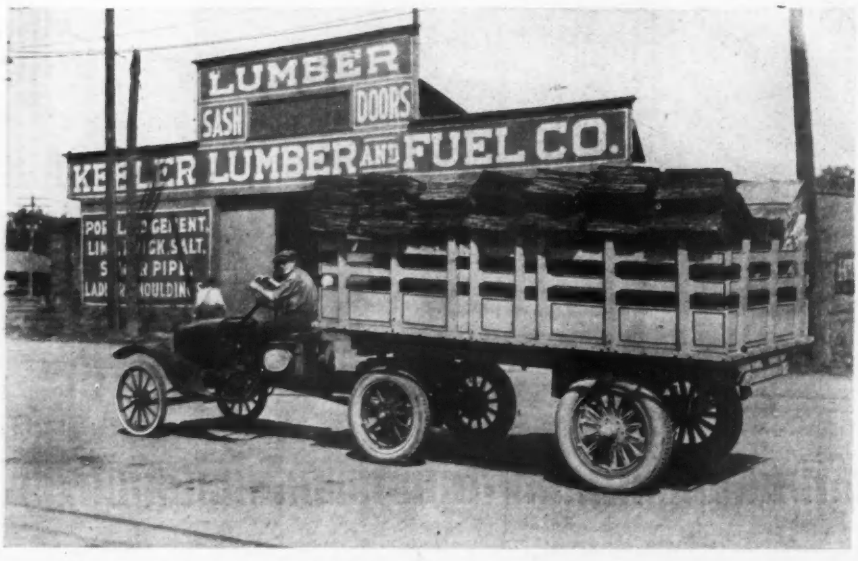
Do not use a solution of calcium chloride or any other alkaline solution which is injurious to the metal parts.

If a non-freezing solution is used to any great extent the upper and lower radiator hose should be removed and inspected, as it is possible the solution has injured the inside of the rubber hose to the extent that it is scaling and likely interferes with proper water circulation. It is cheaper to replace with new hose than take chances of ruining your motor.

With the approach of cold weather it is also well to watch the action of the hoist, in case you have a dump truck. If the action becomes slow and stiff simply dilute the oil with a small quantity of kerosene and you will find the hoist will work freely.

✣

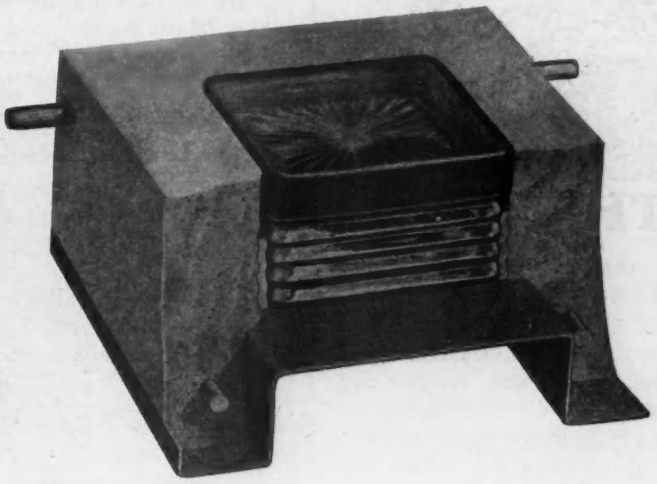
IN the transportation of building supplies under widely varying conditions, dealers and producers have found that the use of a high-grade motor truck is a guarantee of dependable hauling at the lowest possible cost. The stamina of such trucks for hard and constant duty enables them to withstand the severe operating requirements of the builder's service. They have demonstrated an ability to stand up under the constant dropping of loads of stone, sand, gravel or slag from hoppers, buckets and shovels. They have proved themselves possessed of power to pull into and out of pits, drive up difficult inclines and perform many services entirely beyond the scope of the most willing horse. Good trucks know no working hours, and day in and day out are ready for service.




Nn One Doubts That the Keeler Lumber and Fuel Co., Beloit, Wis., Is a Progressive Firm. One of the Reasons Is Their Ability to Deliver Orders Promptly. Their Popular Method Is Shown Here, a "Warner" Trailer Pulled by a Light Utility Car.

# Morlite Products

**Merit**
**Careful**
**Consideration**



**A Complete Store Front and Lighting Service**

Morlite sidewalk light, roof, floor and vault light construction is the only system that can be shipped in the knock down and be complete in every respect when received at the building.

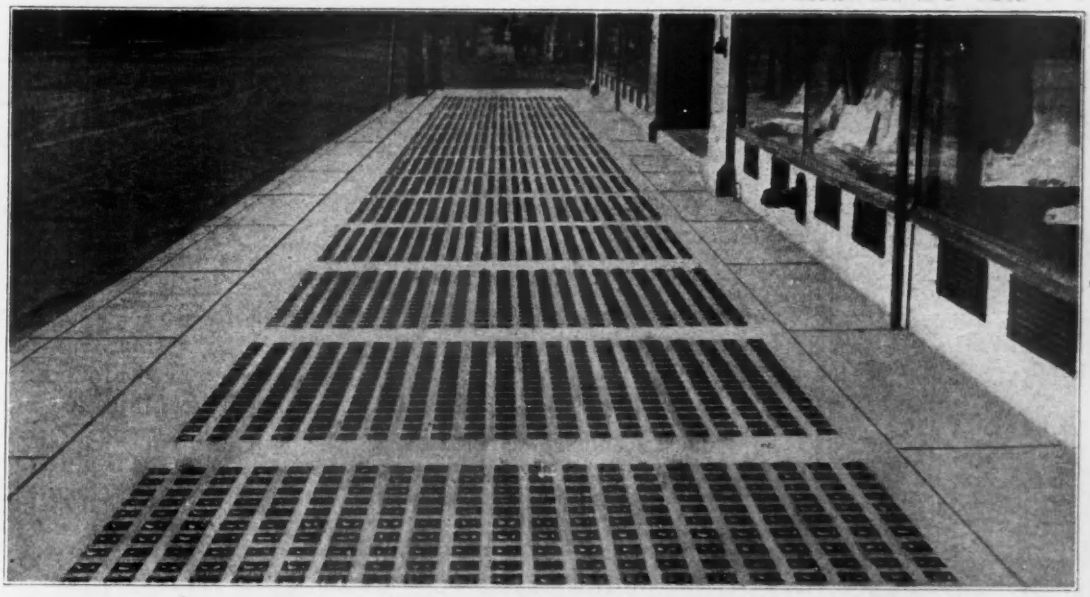
Morlite construction is also furnished in pre-formed slabs.

Each lens individually tested for internal stress and weighs more per light than others—which is an important point.

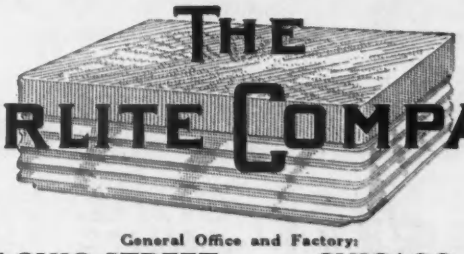
Where breakage does occur replacements can be easily made with minimum trouble and expense. We are in a position to make prompt shipments.

An attractive sales proposition is open to dealers in many locations.

Send for Catalogue A, thoroughly descriptive of the full line.



**Sidewalks**
**Doors**
**Ventilators**
**Coal Ho'e Doors**
**Etc.**



## THE MORLITE COMPANY

**4" x 4" Tiles for Show Windows Transoms**

General Office and Factory:
**404 WEST OHIO STREET - CHICAGO, ILLINOIS**

# NEWS OF THE FIELD

## Mixer Company Appoints New Sales Manager

CLIFFORD F. MESSINGER has been appointed general sales manager of Chain Belt Company, Milwaukee, manufacturers of Rex chains, concrete mixers and elevating and conveying machinery, to succeed L. C. Wilson who has resigned to become secretary of the Federal Malleable Company, closely associated with the Chain Belt Company. Other promotions announced are C. E. Stone, assistant to the vice-president and J. A. Monahan, purchasing agent.

Mr. Messinger, for the last two years assistant to the vice-president, has been connected with the Chain Belt Company since 1911.

✣

## Col. Frank E. Smith Joins Republic Truck

ACCORDING to a recent announcement by John N. Willys, president of the Republic Motor Truck Company, W. J. Baxter, first vice-president resigned, has been succeeded by Col. Frank E. Smith, well known in the automotive industry.

Mr. Willys says that the selection of Colonel Smith for this important position was made necessary by reason of the fact that neither Mr. Baxter nor himself are able to give the local situation the time that the business of the company demands.

Colonel Smith will act in the capacity of the direct representative of the president and board of directors, and because of his long and varied experience in the industry will add great strength to the Republic organization.

✣

## B. Karol, Plumbing Manufacturer, Dies

B. KAROL, head of the firm of that name and a prominent figure in the plumbing business for over thirty years, died recently at his home in Chicago, Ill. He was fifty-five years old.

Just before his death he incorporated the firm under the name of B. Karol & Sons Co., and his sons will continue his business under that name.

✣

## Ventilating Firm Moves Into New Plant

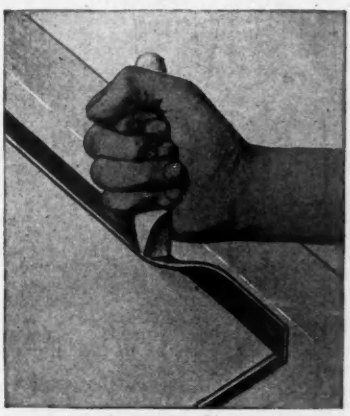
THE Ilg Electric Ventilating Company, Chicago, Ill., recently moved into their new plant at 2850 North Crawford Avenue, that city. The building is solid concrete, 200 by 300 feet, two stories in height and has 100,000 square feet of floor space. The site covers thirteen acres. A cafeteria for employes, shower baths, athletic grounds and club rooms have been provided for. The building cost $400,000..

✣

## Concreting Begins on World's Largest Road Job

ACTUAL concreting on the first stretch of Twohy Bros. 280-mile concrete road in Maricopa County, Arizona was begun Nov. 12. Two mixers operating from what is known as the Fowler setup, will lay the first 41 miles of 16-ft.

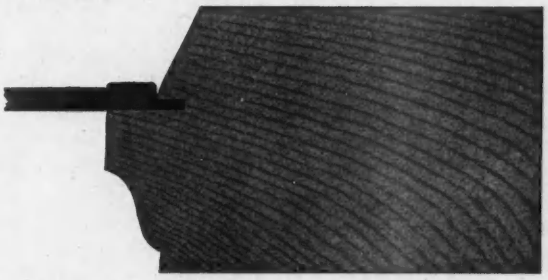
# "The Modern Window" Puttyless Patented Oct. 13, 1908 "The Modern Window"



*This engraving shows Puttyless window being glazed. The lead is turned down on glass with a blunt tool, but in reglazing this can be done with an ordinary clothes pin. The lead can be used over and over again.*

This window is of regular construction except that lead strips are used for glazing instead of putty. Exposure to elements does not affect lead. Puttyless glazing insures a window to be watertight, airtight, non-rattle, durable, economical and of good architectural lines. Prevents glass cracking because lead pressure is even. Every dealer knows the putty troubles. Puttyless glazing eliminates them.

Are widely used. Large and small buildings, dwellings, farm buildings, bungalows, Federal buildings, lighthouses, apartments, churches, club houses, factories, foundries, crusher plants, steel mills, railway terminals, schools, hospitals, insurance and other office buildings and large hotels are already equipped with the Puttyless window.



*This illustration shows section of Puttyless window stile.*

***GUARANTEE—We have perfected the manufacture of this window and consider it as manufactured by us the best on the market and back it by our unqualified guarantee.***

## Puttyless Storm Sash

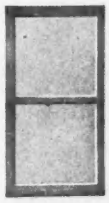
Eliminates all troubles due to cracking and falling out of putty while sash are stored during summer. Puttyless glazing is ideal for storm sash.

**FREE SAMPLE**
**Model of Puttyless Window will be sent free of charge upon request.**

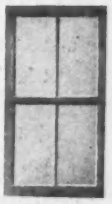
*For Export*—We are prepared to furnish for export

DOORS—Solid Pine, Spruce, Yellow Pine or any other softwood in any style.

DOORS—Veneered Birch, Oak, Gum or any other hardwood in any style.



Windows and Sash—Glazed, Unglazed and "knock-down," either regular construction or "Puttyless."



*Woodwork of any kind*

NEW CATALOGUE **Write for 1921 edition of our General Millwork Catalogue** NEW CATALOGUE

# Gould Manufacturing Co.

**400 Indiana Street Oshkosh, Wis.**

***Founded 1867*** ***Plant Covers 5¾ Acres***

road at the rate of 1300 ft. a day before the material trestle and cement shed are moved. One mixer is seven miles from the material plant, the other, two miles.

A second plant is being installed at Chandler, identical with the one at Fowler. The Chandler plant will begin operations about Jan. 1. With the two plants Twohy Bros. expect to build 280 miles of 16-ft. road in three years from eight setups.

Materials are delivered in bottom dump railroad cars. The cars are shunted on top of a material trestle and dumped direct into bunkers under the trestle from which the tip-over batch boxes are loaded by gravity.

Sand and gravel are obtained from Tempe, where Twohy Bros. have installed a washing and screening plant having a capacity of 1500 yds. per day. Cement is received in bulk and unloaded by means of a Dracco vacuum plant arranged and furnished for this job by the Lakewood Engineering Company. From the time it is loaded into railroad cars, the material does not touch the ground until placed on the road as concrete. The most modern methods are used in every operation. The equipment, representing an investment of nearly a half million dollars, includes four 14-E Lakewood gasoline pavers with batch transfers, 18 miles of narrow-gauge road track, 12 6-ton gasoline locomotives, 216 Lakewood road cars complete with batch boxes and cement compartments, 8 double truck cars, 4 finishing machines and subgraders, two bulk cement handling plants each having a capacity of 900 barrels per day, 8 scarifiers and one clam-shell bucket. ✣

**STATEMENT OF THE OWNERSHIP, MANAGEMENT, CIRCULATION, ETC., REQUIRED BY THE ACT OF CONGRESS OF AUGUST 24, 1912,**

of AMERICAN BUILDER, published monthly at Chicago, Ill., for Oct. 1, 1920.

State of Illinois } ss.
County of Cook }

Before me, a Notary Public in and for the State and County aforesaid, personally appeared E. L. Hatfield, who, having been duly sworn according to law, deposes and says that he is the business manager of the AMERICAN BUILDER and that the following is, to the best of his knowledge and belief, a true statement of the ownership, management (and if a daily paper, the circulation), etc., of the aforesaid publication for the date shown in the above caption, required by the Act of August 24, 1912, embodied in section 443, Postal Laws and Regulations, printed on the reverse of this form, to wit.:

1. That the names and addresses of the publisher, editor, managing editor, and business managers are:
Publisher—American Carpenter & Builder Co., Chicago, Ill.
Editor—Wm. A. Radford, Chicago, Ill.
Managing Editor—Bernard L. Johnson, Chicago, Ill.
Business Manager—E. L. Hatfield, Chicago, Ill.

2. That the owners are: (Give names and addresses of individual owners, or, if a corporation, give its name and the names and addresses of stockholders owning or holding 1 per cent or more of the total amount of stock): American Carpenter & Builder Co., Chicago, Ill.; Wm. A. Radford, Chicago, Ill.; H. M. Radford, Chicago, Ill.; Roland D. Radford, Chicago, Ill.; Wm. A. Radford, Jr., Chicago, Ill.; E. L. Hatfield, Chicago, Ill.; G. W. Ashby, Berwyn, Ill.

3. That the known bondholders, mortgagees, and other security holders owning or holding 1 per cent or more of total amount of bonds, mortgages, or other securities are: (If there are none, so state.) None.

4. That the two paragraphs next above, giving the names of the owners, stockholders, and security holders, if any, contain not only the list of stockholders and security holders as they appear upon the books of the company but also, in cases where the stockholders or security holder appears upon the books of the company as trustee or in any other fiduciary relation, the name of the person or corporation for whom such trustee is acting, is given; also that the said two paragraphs contain statements embracing affiant's full knowledge and belief as to the circumstances and conditions under which stockholders and security holders who do not appear upon the books of the company as trustees, hold stock and securities in a capacity other than that of a bona fide owner; and this affiant has no reason to believe that any other person, association, or corporation has any interest direct or indirect in the said stock, bonds, or other securities than as so stated by him.

5. That the average number of copies of each issue of this publication sold or distributed, through the mails or otherwise, to paid subscribers during the six months preceding the date shown above is. (This information is required from daily publications only.)

E. L. HATFIELD,
Business Manager.

Sworn to and subscribed before me this 1st day of October, 1920.
(SEAL) Andrew John Naumann.
My commission expires Oct. 23, 1920.


# Put Good "Hearts" Into Your Homes

Like a man of wonderful build with a weak heart, is any home you erect with heating equipment that will not economically and lastingly perform.

For the "heart" of the home is its heating plant. Fail your clients there and all the good work you do in other respects counts for little.

Plan the heat when you plan the home. Insist on specifying good heating equipment, and not only do you add more value to the building than the amount of the extra investment, but you permanently insure both the client's satisfaction and your reputation as a builder.

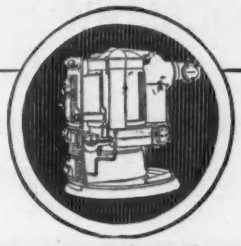
For half a century the Round Oak Folks have made good goods only. Their heating equipment is nationally known and highly regarded. It is advertised as the standard. It helps to sell homes, as a nationally known engine helps to sell automobiles.

The Beckwith Company, Dowagiac, Michigan
*"Round Oak Folks" Established 1871*

# ROUND OAK

## STOVES AND HEATING SYSTEMS

The Round Oak Engineering Department and the local Round Oak dealer will gladly co-operate with you. Heating plans are furnished gratis, if you supply blueprints



# CATALOGS BULLETINS & BOOKS RECEIVED

**The following literature, dealing with subjects of interest to builders is now being distributed.**

**"A Yard of Garages"** is the title of an interesting folder issued by the Richards-Wilcox Co., Aurora, Ill. It is profusely illustrated with pictures of all types of garages showing the various doors which can be used and the hardware needed. All of the doors operate on R-W hangers.

**"Don't sweep your concrete floors away"** is the subject of a folder issued by the General Fireproofing Co., Youngstown, O. This folder contains a description of the new concrete floor hardener, Crystalrox, manufactured by that concern. It is a chemical preparation for hardening concrete floors.

**Solvay Protective Paints** are completely explained in a new booklet now being distributed by the Semet-Solvay Co., Syracuse, N. Y. This line of paints covers all material for iron and steels. This handbook is distributed to architects, engineers and managers of industrial plants.

**"What is a Fair Price"** is the leading article in the October Upson Smiles, house organ published by the Upson Co., Lockport, N. Y. This interesting little book also contains articles on the selling of Upson Board, blankets and board and other subjects of interest to the field.

**A Handbook for the Installation of Federal Metal Weatherstrip** has been prepared by the Federal Metal Weatherstrip Co., Chicago, Ill., and is now ready for distribution to contractors and builders. It contains complete directions with drawings showing how metal weatherstrip is installed on windows, doors, casement windows; also directions for installing brass thresholds, spring bronze, and an automatic self-adjusting door bottom.

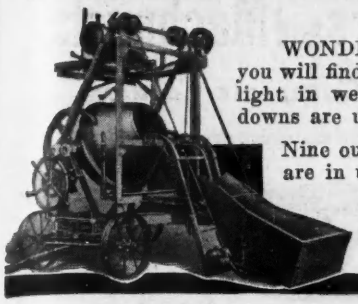
**Ilgair Unit Airwasher and Humidifier** is described and illustrated by photographs and drawings in a new folder issued by the Ilg Electric Ventilating Co., Chicago, Ill. This apparatus controls the climate in offices and factory establishments.

**"5 in 1"** logic is the title of an attractive color folder recently issued by the Austin Machinery Co., Chicago, Ill. It contains several large photographs in color of the Austin 5 in 1 machine used with dragline, crane, shovel and clamshell attachments.

**"Old Deerfield, Massachusetts,"** is the title of No. 5, Vol. VI of the White Pine Series of Architectural Monographs being published by the White Pine Bureau, St. Paul, Minn. The text has been prepared by Rawson W. Haddon and is illustrated by photographs of old historic houses in that community of New England.

**"Making Money by Modern Methods"** is the subject of a folder issued by the Acme Motor Truck Co., Cadillac, Mich. It contains several illustrations of the Acme truck used in road building operations and excavating work; also the specifications of the 2, 3½ and 5-ton trucks manufactured by the Acme factory.

# THE WATERLOO LINE



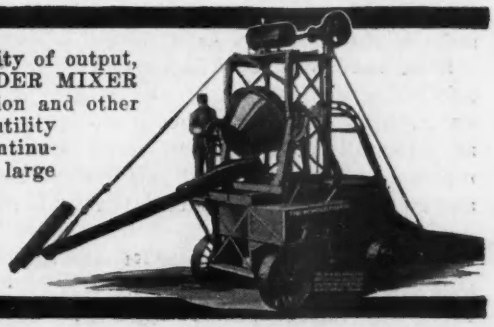
WONDER MIXERS are good mixers. Take any WONDER machine and you will find that it is unusually rapid in action, simple in design and operation, light in weight and easily portable, and superstrong—so strong that breakdowns are unknown and repairs few and far between.

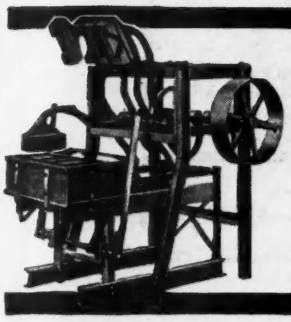
Nine out of ten of all WONDER MIXERS sold within the past nine years are in use today—and their highest average repair cost for any year was $3.59 per machine in spite of the fact that most of them have been driven to the limit. Write today for our big new catalog. It's free.

**MIXERS WITH OR WITHOUT SIDE LOADERS 3 to 7 cu. ft. CAPACITY**

**HI-DRUM PAVERS TRACTION TYPE 7 cu. ft. CAPACITY.**

Those who know the simplicity, mixing speed, quality of output, and other points of proved superiority of the WONDER MIXER realize that the combination of this mixer with traction and other paver requisites produces a paver of great practical utility and profit. The WONDER MIXER is designed for continuous profitable employment. It is adaptable to either large or small paving jobs and is also available for use on other than strictly paving work, being especially valuable where it is necessary to change position frequently. Fully described in the catalog.





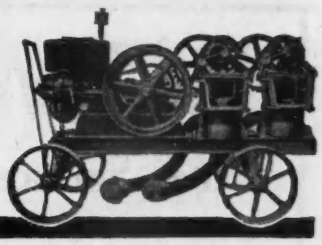
With one WATERLOO-PERFECTION TAMPER with a block attachment and a brick attachment and any suitable building for a shelter you can start in the manufacture of concrete blocks and concrete bricks and within a very short period build up a business which will be immediately profitable. The WATERLOO-PERFECTION TAMPER is a simple, self-contained, economical and highly practical machine. It is simply set on the floor. It need not be braced to the ceiling or anchored in concrete. It is ready to run as soon as power is applied. 1½ H. P. is more than is really needed to drive the machine. Write for complete descriptive literature and prices.

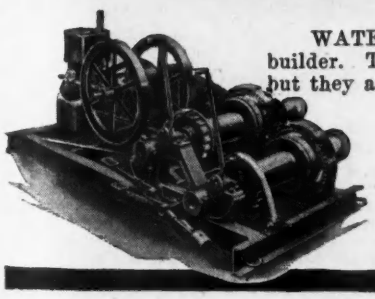
**CONCRETE BLOCK AND CONCRETE BRICK MACHINES**

**SINGLE AND DOUBLE DIAPHRAGM PUMPS**

The WATERLOO IMPROVED DIAPHRAGM TRENCH PUMP is a type found extremely useful in any service where muddy, gritty water is to be handled. It is specially adapted for pumping water from cellar excavations, footings, coffer dams, sewer trenches, steam shovel pits, unwatering conduit manholes. The engine may be used as a small portable power plant by merely disconnecting the driving chain from pump or by removing the pump entirely.

The entire plant is built in our shops and is fully guaranteed as to materials, workmanship and efficiency. You'll find it fully described in the catalog.





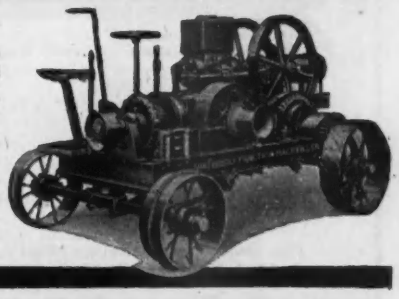
WATERLOO HOISTS are designed to please the average contractor and builder. They are machines of moderate sizes to sell at reasonable prices, but they are built as sturdy and durable as hoists of any size for the price can be made. Every effort has been made to incorporate the necessary features to cover the requirements of this particular field. Close attention has been given to simplicity of design and operation, ruggedness of construction and high efficiency. Our hoists are a development of the Small Unit idea; they meet the demand for efficient, easily-portable machines, economical in operation and requiring only small initial investment. Read about WATERLOO HOISTS in the catalog.

**HOISTS SINGLE OR DOUBLE REVERSIBLE OR NON-REVERSIBLE**

**BACK FILLERS TRACTION OR NON TRACTION**

WATERLOO "DOUBLE QUICK" BACKFILLERS for backfilling, hoisting, grading, pulling, cribbing, snatching teams, loading and unloading, placing pipe in trenches, pulling aerial and underground cables, covering telephone, electric light and power conduits, hauling overground, and the many other daily uses that contractors have for a handy, easily portable power unit.

These machines take the place of slow-moving animal power, involve no expense when not working, and are always instantly available. The initial investment is less than that ordinarily required for a good team, the upkeep infinitely less. Read about these wonderful machines in the catalog.



## WATERLOO CONSTRUCTION MACHINERY CO.
## 103 VINTON STREET. WATERLOO IOWA

**"The Proper Treatment for Floors, Woodwork and Furniture"** is the title of a 32-page booklet issued by S. C. Johnson & Son, Racine, Wis. It deals with the applications of enamels, varnishes, stains, prepared wax, wax liquid, wax paste, undercoating, wood dyes, filler, and contains illustrations showing how these various materials are applied. It can be obtained by writing the concern.

**"G & G Electric Telescopic Hoists"** are fully discussed and illustrated in a booklet being distributed by Gillis & Geoghegan, New York, N. Y., manufacturers of the devices. It is used in industrial establishments to save labor in hoisting material and ashes. Illustrations of the same hoist operated by hand are also shown.

**Boca Solid Steel Sash** is fully described and illustrated in Catalog D20 issued by the Bogert & Carlough Co., Paterson, N. J. The subjects included under this head are sidewall sash, monitor sash, power house sash, mechanical operators, steel partitions, tubular steel doors and steel door frames. Specifications for this material are included in this catalog.

**The year book for 1919-1920 of the Beckwith Company, Dowagiac, Mich.,** is now available. It has a beautiful cover with raised figure of the Indian head and contains descriptions and illustrations of the various products manufactured by the Beckwith Company. The list includes stoves, ranges, furnaces and heating plants of all kinds.

**"Blue Print Reading"** is the title of a new book on interpreting working drawings written by E. M. Wyatt, manual training supervisor, Houston, Texas, and published by the Bruce Publishing Company, Milwaukee, Wis. It is designed to teach the novice how to read the blue print quickly and gives the fundamental principles of mechanical drawing and drafting conventions. Price, $1.00.