THE NATIONAL BUILDER

Vol. XXXVI.
No. 5.
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$2.00 Per Year.

CHICAGO,
May 15th
1903.

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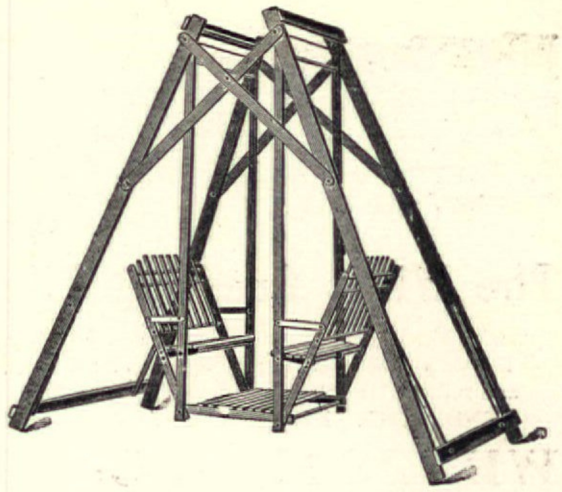

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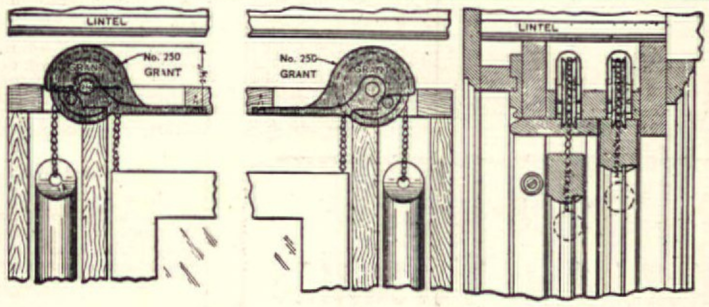

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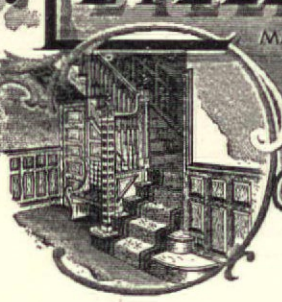

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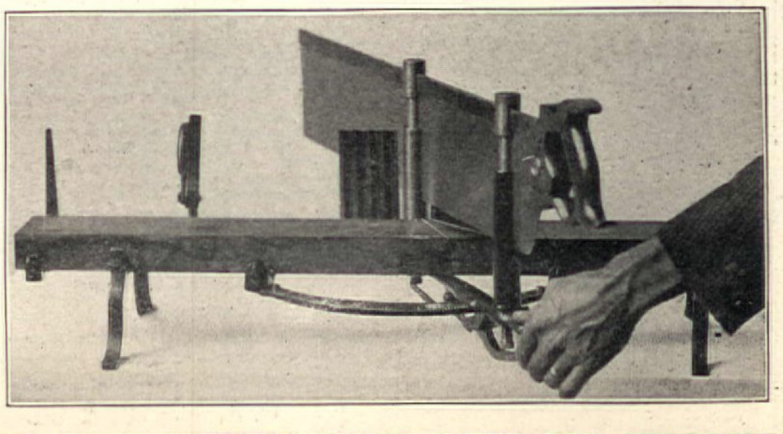

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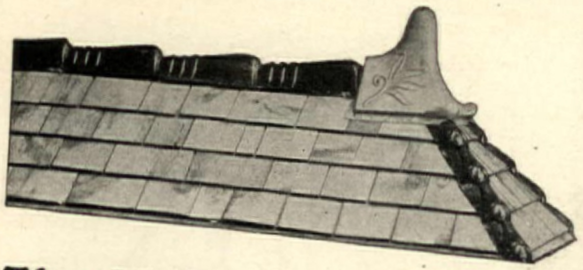

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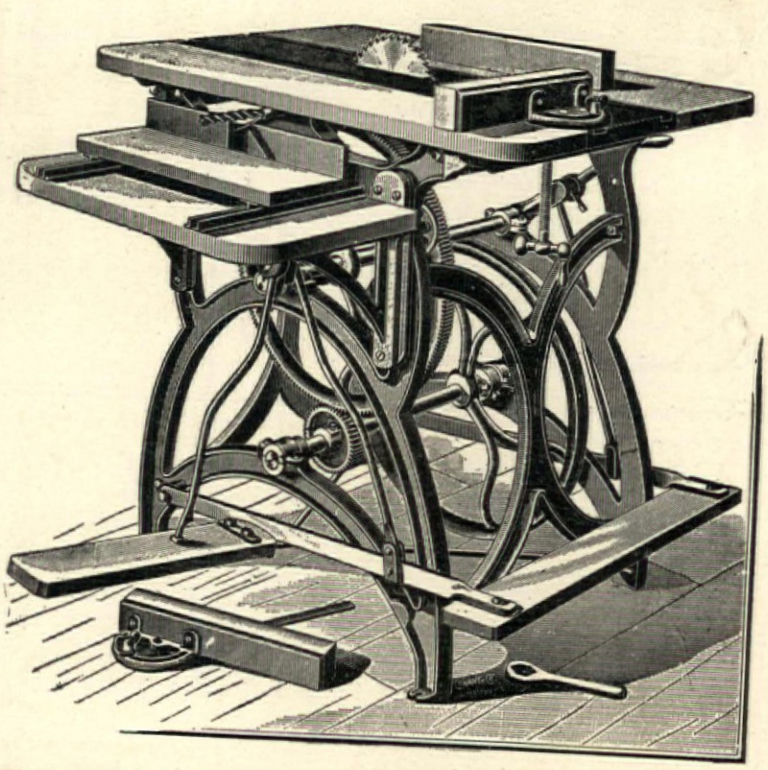

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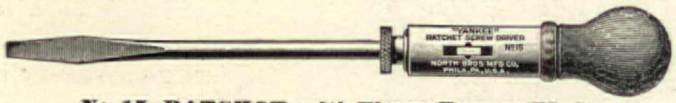

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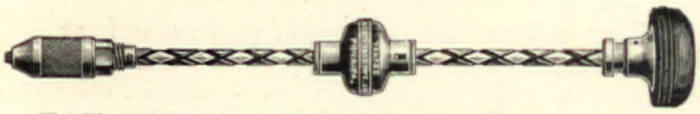

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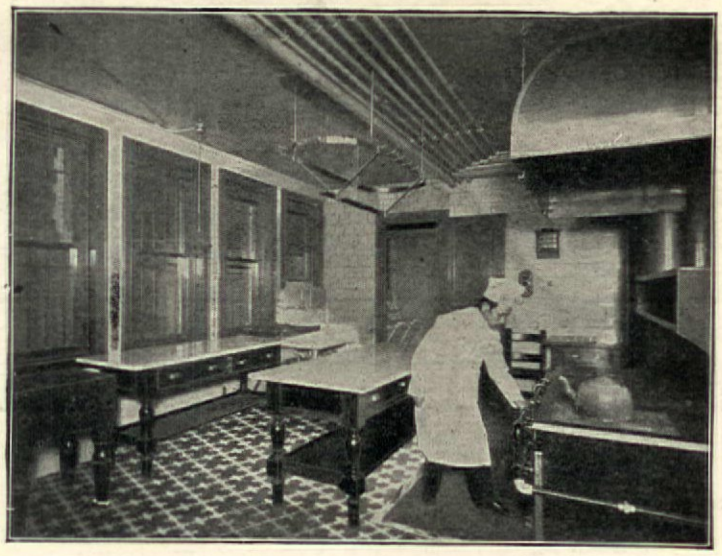

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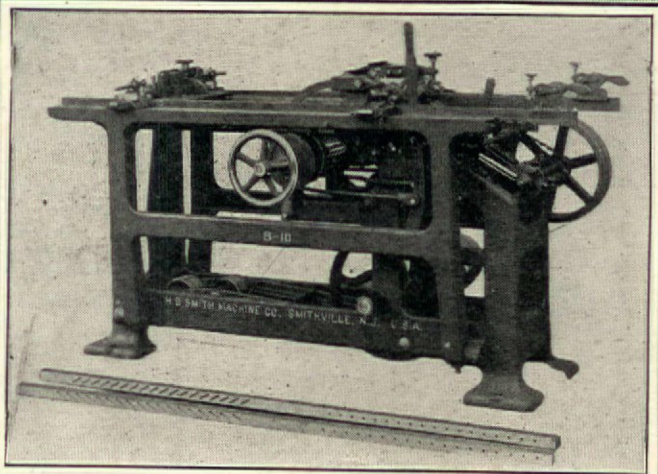

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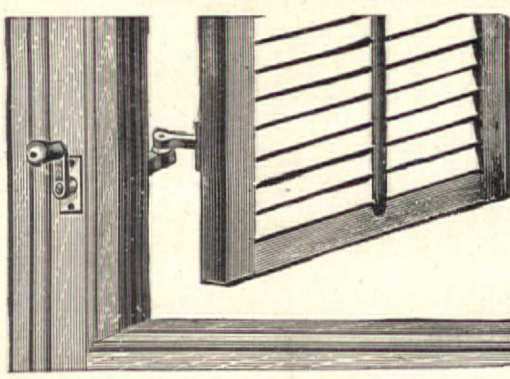

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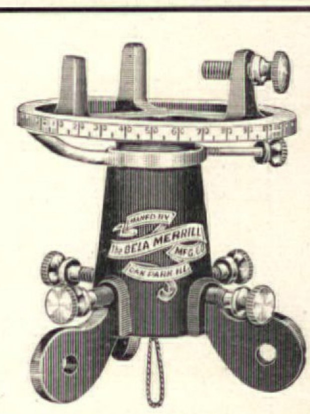

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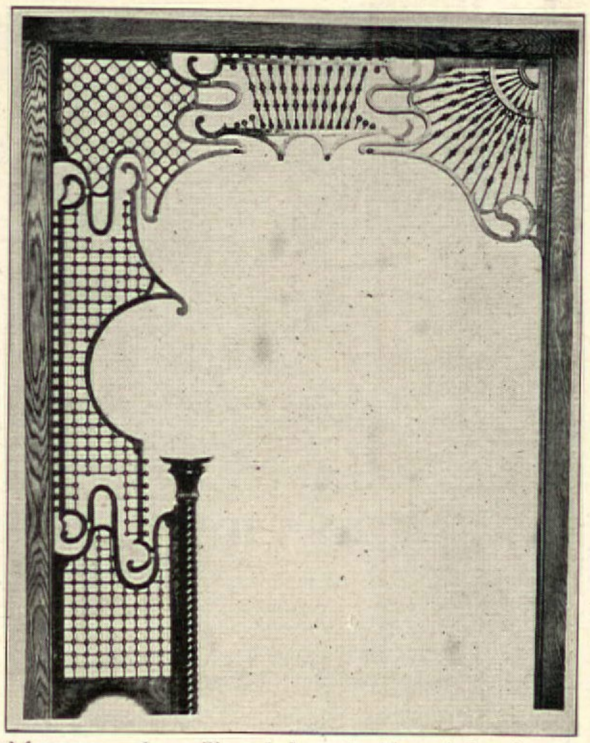

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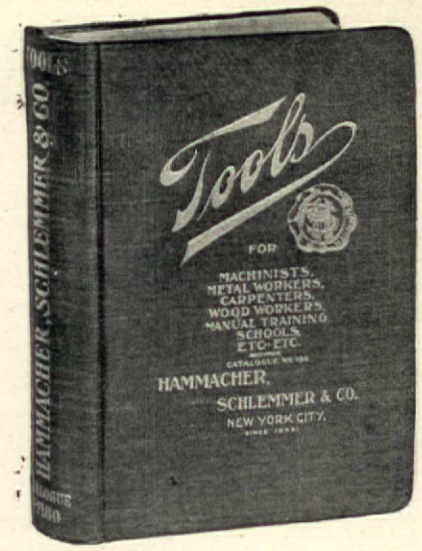

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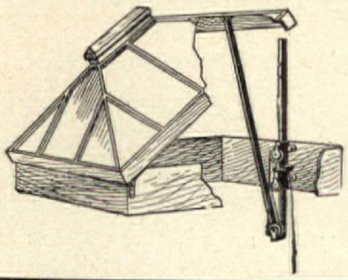

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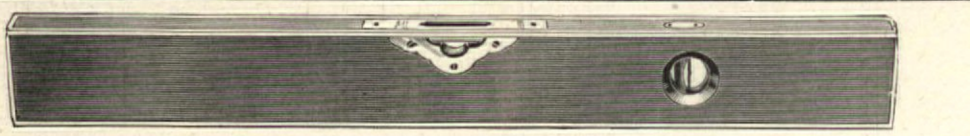

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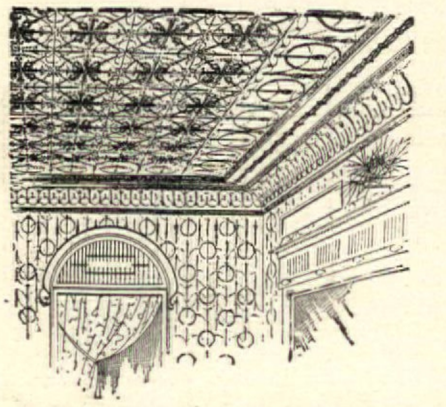

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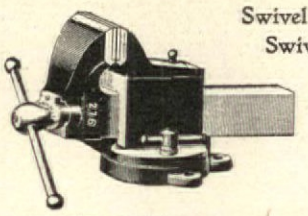

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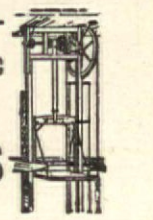

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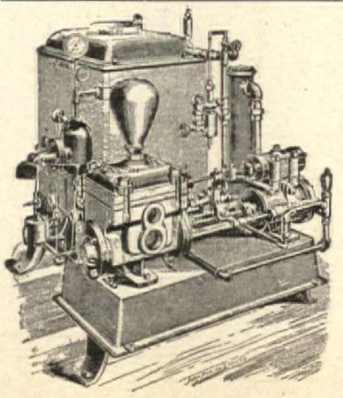

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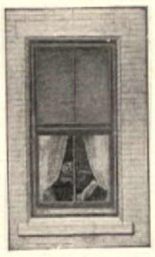

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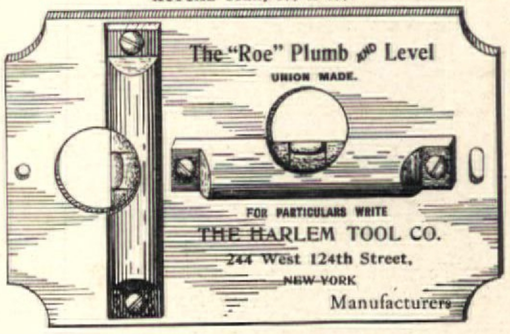

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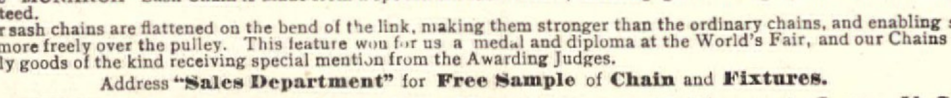

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INDEX.

The National Builder.

BUILDER AND WOODWORKER, ESTABLISHED 1864.
NATIONAL BUILDER, ESTABLISHED 1885.

CHICAGO, MAY, 1903.

VOL. XXXVI, No. 5

With Which is Merged THE INTERSTATE ARCHITECT of Cleveland.

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DEVOTED TO

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FRED T. HODGSON, Architect, - - - - - - Editor

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Issued on the 15th of each month.

Readers should note our advertising pages; in them they will see many things that may interest them. Nearly all new building materials are advertised, and new tools, new appliances and new designs are advertised from time to time in our pages. Readers will also confer a favor on us if they will make mention of THE NATIONAL BUILDER when writing to advertisers, or sending for catalogues or circulars that have been noticed in this paper. This little matter will not entail much labor, and may benefit us materially.

Investigation is said to have shown that the increase of wages for 1903 obtained by workmen of all classes, over the amount paid out for 1902, will reach the enormous sum of $350,000,000. This large sum of money goes into the pockets of the working man, and while he may be obliged to pay a trifle more for some of the things he will purchase, he will earn a pretty good sum more than he did in 1902. The less number of hours he works will also tend to make him feel more and more like somebody of importance. This is as it should be.

There is still a state of unrest in the building trades, and at this writing word comes to us from several parts of the Union that strikes are likely to occur in New York, Chicago and Philadelphia among the carpenters, bricklayers and plasterers. There is trouble in Greater New York between the members of the Amalgamated Society of Carpenters and Joiners, which is an English society, and the United Brotherhood of Carpenters and Joiners, which is purely an American institution. The quarrel is of long standing and is a misfortune, as it leaves both societies open to adverse criticism. Just now, the builders of New York seem inclined to favor the Amalgamated Society of Carpenters and Joiners, and refuse to employ members of the Brotherhood,because of the latter having violated an agreement entered into some time ago. At a convention held in Toronto, Ont., last month, President Gompers tried to settle the difficulties between the two societies; and after some discussion the whole question was submitted to a committee who will report or settle the matter. As matters now stand, the one society is played off against the other by employers.

It is a mistake to suppose that concrete made with Portland or any other cement, is absolutely a safe material to build every sort of work with, or that as now employed is a perfect fire-proof substance. There have been a number of serious failures recently of concrete construction commencing with the fall of three floors of the Hotel Oswego, which fell last October; a warehouse in Pittsburg, belonging to Kaufman Brothers; the Wonderland Theater at Detroit; the Bell Telephone Company's building at Philadelphia; the Paddington apartment building, Chicago; the Conservatory apartment, Boston; the Johnson Service Company's building, Milwaukee, and the Lawrence Savings Bank at New Castle, Pa. These are only a few of the failures—the most prominent. We could quote a number of others of more or less magnitude. It is not likely these failures are simply because of the concrete being insufficient. More probably the faults lay with the methods, both of using the material and of the mode of construction. As a fire-proofing material concrete may be all right, but the many failures in which this material had been depended upon, throws suspicion on its efficiency. Perhaps the failures are due to bad methods, careless workmanship or inefficient inspection, or all of these combined.

An Irish paper recently reported the discovery in a bog, of a long wooden boat. Some men were digging for turf, and their spades happened to hit something hard. On digging away for some hours they revealed a perfect boat carved from the trunk of an oak tree. On it is some very beautiful carving. It is more than 46 feet in length, and showed absolutely no signs of decay, for the wood was so hard that hatchets and other tools scarcely made an impression upon it. It is probably twenty centuries old, at the very least.

It is astonishing to see men who have been contractors for years, make such unaccountable estimates for work. We had brought to our attention a case in point the other day, when five carpenter contractors tendered on the woodwork of a brick house that was to cost something less than $3,000, in which there was a difference of about $500 in the tenders between the highest and lowest. This seems unaccountable, for the parties wanted to secure the contract, so the high tender was not given in because the tender had too much work. This is not an isolated case; such things are happening every day. The only reason we can assign for this state of affairs is that most builders make up their estimates in a haphazard way.

While there is no royal road to estimating, there is no great difficulty in making up a fairly correct estimate both of quantities and cost of labor. Care and perseverance are the main requisites in the make-up of a reliable estimator.

Who is the benefactor of the race that will break the way for the conversion of the desolate roofs of city dwellings into a thing of beauty and a garden of delight? Subjected for a large part of the year to heat of the tropics our houses are built as though our climate was a perpetual winter. Surely it is within the power of our architects to provide for a secure and delightful retreat upon the housetops where, for a portion of the year, we might emulate the glories of the gardens of Babylon.

WEIGHING A BUILDING.

BY B. WYAND.

It is very seldom that an architect in this country is called upon to weigh up an entire building. but in these days of steel and iron work and of huge structures supported entirely upon a few stanchions or columns, with the superincumbent weight imposed upon steel joists, girders and bressummers, it behooves every one concerned to have some acquaintance with the operation known as weighing. Far too many men work by rule-of-thumb alone, knowing from their everyday practice the required sizes for steel or wood girders and bressummers in ordinary positions and on ordinary jobs; but, after all, there is nothing like mathematical precision, and a few simple rules I give will be sufficient to ensure this with a minimum of trouble and but very little working out.

In weighing a building or a portion of a building the points to receive attention are—the weight of the carcase; the weight of the floors and their loads; the weight of roofs and coverings, and wind-pressure. In all cases the weight of any exceptionally heavy timbers or of any ironwork should be carefully added. I purpose first to give the data from which to calculate the weight of an entire building, showing afterwards how these may be applied to determine the weight to be borne by any particular portion.

Foundations.—The foundations of a building will not, except in special cases, need to be taken into account; for they should be proportioned to the weight of the building they have to carry, and should rest upon a sound and substantial bottom, their work being simply to spread the weight of the superstructure. The approximate weights of lime- and cement-concretes are 120 pounds and 137 pounds respectively to the cubic foot.

Carcase.—Material in walls and partitions must be measured, bringing brickwork to rods and stonework to feet cube. In the case of ordinary timber partitions having approximately 4-inch by 4-inch posts, heads and sills, and 4-inch by 2-inch studs, the lowest figure given below will be found a safe one.

The following weights are from universally recognized tables, and may be absolutely relied upon. Where the figures given by different authorities have varied, I have in all cases taken the heaviest:

Brickwork, 1 rod equals 16 tons; stonework, 1 foot cube equals 1 to $1\frac{1}{2}$ hundredweight; stonework (average) 16 cubic feet equals 1 ton; timber partitions, 1 square equals 13 to 17 hundred weight.

In weighing stonework in large quantities it will be as well to ascertain the precise weight of the stone used. Mortar averages from about 90 pounds to 115 pounds per cubic foot; and as the average of stone is 140 pounds per cubic foot, stonework can be weighed as if solid without joint.

Floors and ceilings.—It is obvious that in floors which have to carry live loads the actual weight of the floor itself is but a detail, and it would at first sight appear somewhat difficult to say exactly what proportion of the floors of a building should be calculated as bearing a live load. In the case of a warehouse or a factory, where every floor is in daily use, the full weight should certainly be calculated for; but in that of the ordinary dwelling house, where perhaps only a couple of rooms are in occupation at any one time, it is somewhat different. The safest course to steer, however, is to give the full weight of the live load to every floor in all cases, omitting, of course, the ground or basement floor when its weight is thrown directly upon the site of the building. The following are weights of floors:

Weight of single-joisted floor, 1 square equals 11 to 17 hundredweight; weight of framed floor, 1 square equals 22 to 35 hundredweight. But the calculations below (which include both weight of floor and load) are those which should be used. It must be noted that these are taken at per foot super, and not per square:

Dwelling-house floors, per foot super equals $1\frac{1}{4}$ to $1\frac{3}{8}$ hundredweight; public hall and workshop floors, per foot super, equals $1\frac{1}{2}$ to $1\frac{3}{4}$ hundredweight; warehouse, heavy goods store and factory floors, per foot super, equals $2\frac{1}{2}$ hundredweight. Ceilings (as apart from floors) including lath and plaster and ceiling joists, work out at about 12 pounds per foot super.

Roofs.—Taking the loads in roofs, without having any regard to wind pressure, the following are the figures to work upon: Per square of 100 feet: Lead covering, exclusive of framing, 7 hundredweight; zinc covering, exclusive of framing, $1\frac{1}{2}$ hundredweight; corrugated iron, exclusive of framing, 3 hundredweight; tiles covering, exclusive of framing, 9 to 15 hundredweight; slates covering, exclusive of framing, 8 to 9 hundredweight; $\frac{3}{4}$-inch deal boarding, $2\frac{1}{4}$ hundredweight; 1-inch deal boarding, 3 hundredweight; $1\frac{1}{4}$-inch deal boarding, $3\frac{3}{4}$ hundredweight; 3-inch by $\frac{3}{4}$-inch slate battens, $1\frac{1}{4}$ hundredweight; common wood rafters, $2\frac{3}{4}$ hundredweight.

There is no need, however, to calculate the items of the ordinary roof separately. The following will be near enough for all practical purposes:

Timber framing for slate or tile roof, 5 to 6 hundredweight per square. The weight approximately for iron roof-trusses, in pounds (according to Hurst) equals the square of span in feet, multiplied by .7 for spans between 20 and 40 feet, by .8 for spans between 40 and 50 feet, and by .9 for spans between 50 and 60 feet. The weight in pounds of wood trusses equals square of span in feet.

Wind-pressure.—The pressure of wind upon the roof, together with the weight of snow which could accumulate in the heaviest downfall, must always be calculated in weighing a building; for the walls have to support the strain and stress of these in addition to the actual roof covering itself. The question of calculating the pressure of wind upon walls in very exposed or exceptional situations does not come within the scope of this article.

Wind-pressure will, of course, vary largely with the pitch of the roof, and snow according to both pitch and climate, and no one figure will therefore be suitable to meet all cases.

Per square of 100 feet. For wind, vertically on roof, $\frac{1}{4}$ pitch, 17 hundredweight; ditto, 1-3 pitch, 20 hundredweight; ditto, $\frac{1}{2}$ pitch, 22 hundredweight. Snow, according to climate, from 3 to 9 hundredweight. These are practically Hurst's figures, only he works them out at per square foot super. Young gives a general all-round figure.

Additional load on roofs for pressure of wind, 36 hundredweight, which should be sufficient, and amply so, in all cases for both wind-pressure and snow.

Sundries.—I have said that any exceptionally heavy timber or ironwork should be reckoned in, but as the weights of timber may be found in any book on building construction, and the weights of steel and iron obtained from any of the numerous catalogues of castings, I do not purpose hampering this article with them. I therefore proceed at once to the second portion—the application of the foregoing calculations to any particular portion of a building.

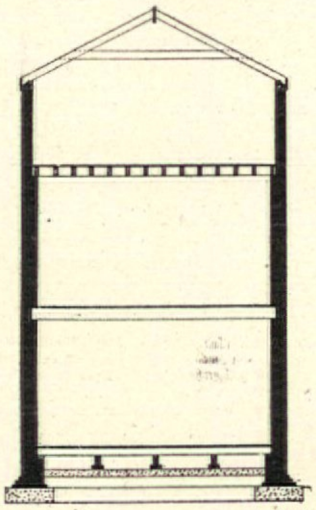


FIG. 1.

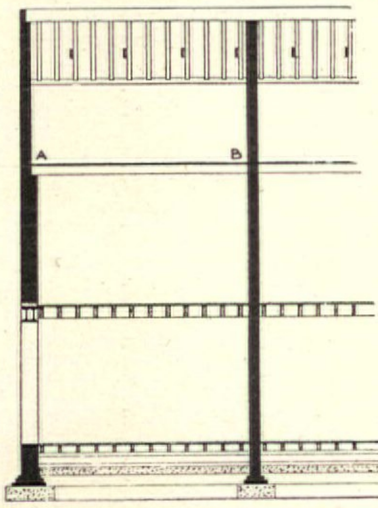


FIG. 2.

TO WEIGH PART OF A BUILDING.

The first example I give (see Figs. 1 and 2) typifies a case to be met with in everyday practice. The building, a dwelling-house, is to be converted into shop premises, and for that purpose the front wall below the first floor must be removed and a bressummer thrown across. We have, therefore, to determine what weight this bressummer will have to bear. Figure 1 is a cross-section taken through the building parallel with the street; figure 2, a section through the building from front to back.

On looking carefully at these sections we find—

(1) That the whole of the brick wall in the gable end will have to be supported upon the bressummer.

(2) That the first floor is carried on joists supported entirely by the side or return walls.

(3) That one end of the second-floor joists is built into the brick wall to be borne by the bressummer.

(4) That the feet of the roof rafters rest upon pole-plates, carried (like the first-floor joists) upon the return walls. The roof is a collar-beam roof, without purlins, and the only portion supported by the gable wall is the small strip bedded upon the wall itself, of which it is scarcely necessary to take any account.

Now, to take these four items and calculate the weight of each.

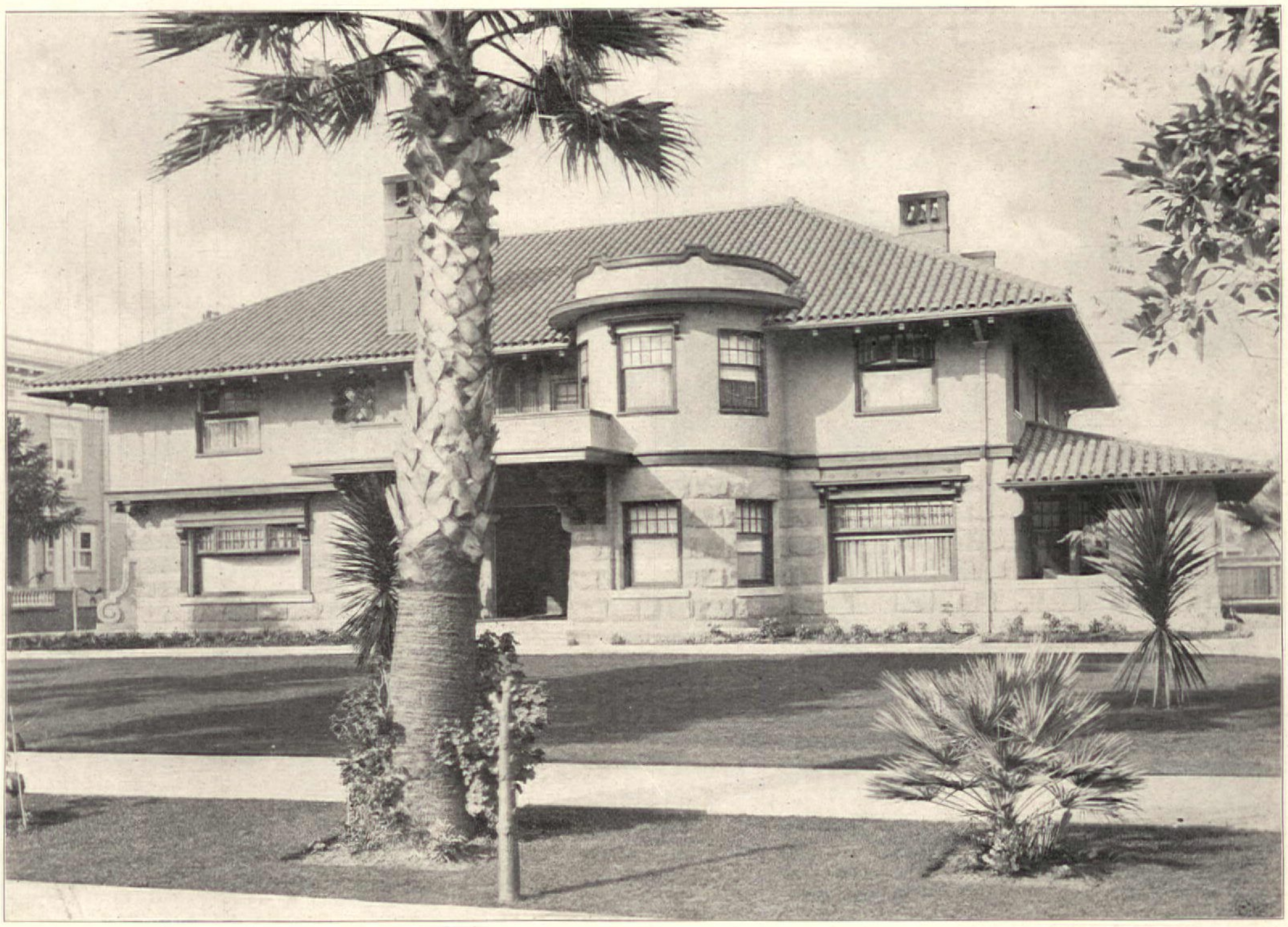
Brickwork.—The gable wall supported by bressummer contains (exclusive of openings) 160 feet super. of 14-inch work and 150 feet super. of 9-inch work, or, in all, 260 feet of reduced brickwork. For our purpose this may be taken as one rod, which is, as everyone knows, 272 feet of reduced or 14-inch work.

Floors.—The first floor, resting upon the side walls, does not enter into our calculations. The second floor, it will be seen by reference to figure 2, runs across a 9-inch partition-wall in the center of the building, and the portion bearing upon the front wall reduces itself, therefore, to half that which lies between these two walls, i. e., half the floor between the points A and B, taken the full width of the building. The area of this floor is 17 feet by 15 feet 9 inches, equals 268 square feet, of which one-half is to be borne by the bressummer.

Roof.—The small portion referred to above as bedded upon the wall contains about 21 square feet, or 1-5th of a square. The pitch is ¼, and framing need not in this case be taken into account.

Summary: Brick work, 1 rod, equals 16 tons; floors (dwelling house) 134 square feet, at 1¼ hundredweight, equals 8 tons and 7½ hundredweight; roof (slates), 1-5 square, at 8 hundredweight, equals 1 3-5 hundredweight; roof (wind-pressure and snow), 1-5 square, at 36 hundredweight, equals 7 1-5 hundredweight. Total (disregarding fraction) 24 tons, 16 hundredweight.

In one place he found that the line of cutting on a granite core made by a tubular drill form a uniform depth throughout, showing that the cutting point was not worn as the work advanced. The regular taper of the core would also go to prove that the drill was set with jewels on the inside and on the outside alike, thereby facilitating its removal. In some specimens of granite he found that the drill had sunk 1-10 in. at each revolution, the pressure necessary to accomplish this having been at least two tons. The capacity of the tools and the skill of the workmen are illustrated by the clean cut they made through soft and hard material alike, there being no difference in the width of the groove when it passes through soft sandstone and granite as hard as iron. Nothing is known concerning the material of which their tools were made or how the jewels were set. The diamond was very scarce at that time, therefore the only logical conclusion is that they used corundum.



RESIDENCE AT LOS ANGELES, CAL. HUNT & EAGER, ARCHITECTS.

We find now that we require a bressummer to carry 25 tons over a clear span of 16 feet, 6 inches, and turning to our tables of safe loads on rolled steel joists we find that a 10-inch by 6-inch is guaranteed to bear a load of 14¼ tons. We select two of these in preference to one of greater depth, as we have a 14-inch wall to support above. Their combined carrying power is 28½ tons, leaving a good margin of safety.

(To be continued.)

OLD TIME TOOLS.

During a residence of two years, in a tomb at Gizeb Wilhelm M. Flinders Petrie collected evidence showing that the tools used in working 4,000 years ago were made with the jewelled cutting edges, as is the modern custom. He gave his reasons for coming to these conclusions, and proved in a very satisfactory manner that the pyramid builders used solid and tubular drills, straight and circular saws, and many other supposed modern tools in erecting that greatest of buildings. He also showed that their lathe tools were set with jewels, and that they did work with them that would puzzle the modern artisan.

MARKING BLUE PRINTS.

It has become the custom to use a soda solution, using it as ink, and the result is a white line not very different from the print. The soda on the surface of the paper collects dirt and the lines fade and lose their original intensity. The right way is to write your figure in ink, then take your ruling pen and put a blot of soda over the spot. This whitens the background and turns the ink jet black, and is done in half the time and twice as nicely as any other way. The white spot is there to stay, and the ink will never fade.—The Draftsman.

WORTH KNOWING.

Drain-pipes and all places that are sour or impure may be cleansed with lime water or carbolic acid.

Oil of lavender will drive away flies.

Grained wood should be washed with cold tea.

If a bedstead creaks at each movement of the sleeper, remove the slats and wrap the end of each in old newspapers. This will prove a complete silencer.

QUAINT SKETCHES.

BY RAMBLER.

Continuing my sketches on Egyptian ornamentation, I may say that at one period the scarabeus or beetle was a prominent figure in many ways. When employed in ornamentation it was generally depicted on a ground of the royal color, blue. The worship of this repulsive creature is another of the incomprehensible features of Egyptian religion, an insect with all the qualities of repulsion, insignificant, not even venomous, is raised from its sand hill and ranked with the gods, its image is worn as an amulet, it is sacred to the sun, and an emblem of creation and a new life. This may explain its presence on the mummy cases.

The waving lines in the center ground of all designs, are all symbols of the Nile, the zig-zag at the top is still preserved as Aquarius, the water bearer, in the signs of the Zodiac, and we find its traces in the Norman and early English styles. In the tombs, this decoration of the center wall, broad-winged figures of Isis and Nephthys, Fig. 1, either in a sitting or standing position, and with one wing pointing toward the nether world, the other at the sun.

Upon their head was the globe, and over their forehead the deadly Uraeus, symbol of sovereign power, always found in the diadem of the Pharaohs.

There may be many faults in the Egyptian mode of decoration, grace, it is true, has been sacrificed to sublimity, but there was skill displayed in the arrangement, and taste in the selections; the flatness of their drawing was relieved by the admirably harmonious disposal

FIG. 1. THE GODDESS ISIS.

of their colors; everything was made subordinate to effect, moldings were never permitted to interfere with the continuity of the decoration; the custom prevailed of concentrating the ornament to a central point, the columns at the extremities of a chamber were plainer, and became more elaborate as they neared the center, where the climax of elaboration was achieved; and we can readily fall into Denon's enthusiastic exclamation, "One is fatigued with writing, one is fatigued with reading, one is stunned with the thought of such a conception. It is hardly possible to believe in so much magnificence even after having seen it."

Existing contemporaneously with Egyptian art, that of Assyria partook necessarily of it in some degree. The Egyptian influence is found in many of their buildings, the winged globe is often seen and the Uraeus raises its head in the one place as in the other.

The successors of Cambyses, that Assyrian king who conquered Egypt, called Egyptian artists to aid in the adornment of their chambers, and these artists were compelled to adopt the forms which they had been accustomed to associate only with the decoration of the temples in their native country, to the embellishments of private dwellings in Assyria,and by this adaptation and loss of the surroundings which had given them a symbolic character, they became merely decorative figures, void of distinct meaning.

The decorative art of the Assyrian shows us two distinct periods—an older and a more recent one. The older works had a bluish green ground; the later a light ground, either whitish or yellowish. In both styles the outlines are marked strongly in black or dark red. In the older the sinews are more ropelike and less correct in their anatomy. Polychromy was known to them, but it is difficult to decide whether they colored in tempera or in fresco, with wax or by some other means, perhaps in oil. The incrustation of clay walls with baked and painted, and even glazed tiles, it is difficult to explain. In many instances each one has its own color, and by a proper arrangement, squares, diapers and networks were produced. At Babylon and Nineveh the tiles show clear marks of painting. Diodorus gives us a description of the interior wall of the royal palace at Babylon, and says: "It was decorated with all sorts of colored human and animal forms, baked in clay, much resembling nature. The whole represented a hunt!" The principles of decoration with the Assyrians far surpass mere ornamentation in geometrical patterns. Dramatic life of a higher kind is introduced, showing greater artistic power than the reliefs in stone. The outlines are neither black nor red, the treatment is tasteful, the colors a tender blue, brown, white or yellow, and the ground a lightish green.

The winged bull, Fig. 3, was an incident of Assyrian decoration as characteristic as the winged globe of the Egyptians. It figured upon their walls and guarded the entrance to their palaces. It might be properly classed as a composite animal, with the Sphinx of Egypt or Greece, Fig. 2, or the Chimera of Rome; with the differences, that the Egyptian Sphinx was always represented as a male and without wings, the Grecian as a female and winged, the Chimera as a monster neither animal nor human, having no prototype, in whole or in part, among living creatures; while the bull of Assyria, selected to sentinel

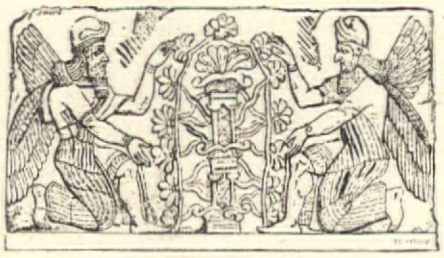


FIG. 3. THE SACRED BUSH.

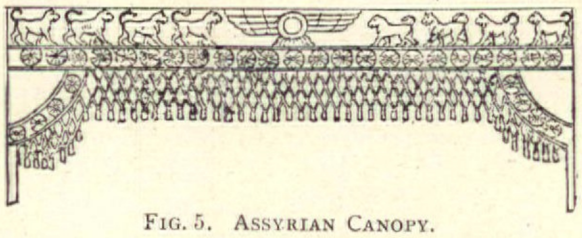


FIG. 5. ASSYRIAN CANOPY.

FIG. 4. ASSYRIAN WINGED BULL.

the country, combined the attributes of the protector in bodily strength, a head of wisdom and winged omnipresence.

A profusion of golden paneling and gilded or silvered surfaces, is found in all the discovered palaces. "I have ascertained," says Texier, "that there is not a corner of the palace (Persepolis) in which there is not the most delicate and careful painting; it was the same at Khorsabad, at Nimrod, and also at Ecbatana, the capital of Media, where, according to Polybius, in his description of the palace of the Kings of Persia, the porticoes, the peristyles and the walls were covered with plates of gold and silver, which were pillaged by the soldiers of Alexander." This gilding was laid on a base of enameled bricks, overlapping each other so as to form saw-tooth ornament.

Zobeide, in the account of her wanderings related in the veracious volume, "The Arabian Nnights," tells of visiting the palace of the petrified queen, and explains that she "discovered a gate, covered with plates of gold, the two folding doors of which were open, a silk curtain seemed drawn before it, and a lamp was suspended inside of the gate." Authorities much more authentic than this one is credited with being, tell of the elaborate hangings indulged in by the early peoples of the East, and the rich stuffs used by them for this purpose. We can refer to the unparalleled elegance of the Oriental portieres of today to sustain the reputation of their ancestors, and no more graceful mode of hanging decoration can be imagined than that shown in the fringed border of Fig. 5. It forms the termination of a frieze, and is suspended upon a bar extending around a room; the material used was stuffs, or probably in rare instances silk, and it is a suggestion not unworthy of imitation. It was not unusual for alabaster slabs to be set in the walls, held together by clamps either of iron, copper or wood. Above the alabaster slabs, plastered decorations were used; in some cases painted frescos have been found, or mosaics formed with enameled bricks of various colors.

Several of the illustrations given are taken from the ruins at Khoyunjik, in which have been found some of the most beautiful and finished examples of Assyrian art. In its border may be traced the

FIG. 2. EGYPTIAN SPHINX.

influence of the lotus ornament of Egypt, and possibly a distant resemblance to the later honeysuckle of the Greeks.

There is one ornament to which the people attached a superstitious regard, probably the only one, but it is used so generally that it would not be doing justice to the subject to neglect to revert to it, even though it does not properly belong to ornamental decoration.

A peculiarly formed bush was known as the "Sacred Bush," Fig. 4, and looked upon with peculiar veneration; it is reasonable to think that it has some affinity with the idea of the "Tree of Life," and probably the early people so regarded it.

Not the least noticeable among their lighter innovations was the imitation of a canopy stretched between the spectator and the sky, and bearing the decoration of the ceiling. Assyrian art has left but little influence upon the art of today, very few of its peculiarities survive, and these are not received with a marked favor. Its mission was rather to be a link between the nomadic and the

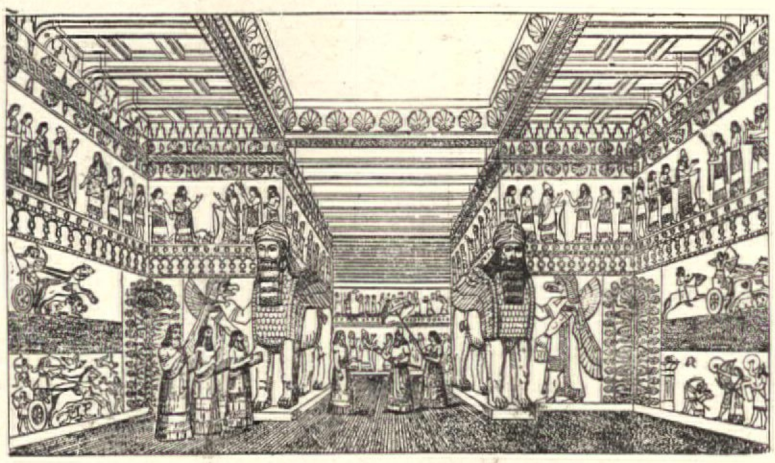


FIG. 6. A RESTORED ASSYRIAN TEMPLE.

monumental phases of art. Fig. 6 shows the interior of an Assyrian Temple restored, and is doubtles a pretty truthful representation.

SUGGESTIONS FOR USING PORTLAND CEMENT.

Keep the cement perfectly dry until ready to use it in mortar.

Use dry, clean, sharp sand, and use the least amount that will fill the voids. Increasing the percentage of sand reduces the strength and slows the setting. Wet up only so much mortar at one time as can be used before setting commences.

Do not permit the finished work to dry out quickly; after it has commenced to harden cover with wet sand or burlaps and keep wet for a fortnight. Concrete ditches, flumes and reservoirs should be washed over with a thin cement, grouting fast as built. After the mortar has set a day or two it is well to flood it and keep the water standing stagnant a fortnight.

If the finished work cannot be kept covered as above, keep wetting it by daily sprinkling. Water is the life of Portland cement mortar.

When concrete is laid in large bodies it is allowable to imbed irregularly throughout its mass as many large stones as is consistent with their being well bonded together by the mortar.

In concrete it is desirable that the aggregates should be graduated in size, then they pack closer and require less cement mortar to fill the voids. The stone should be hard, angular and free from dust.

Do not mix lime with cement, it tends to make the mortar crack.

In masonry the stone or brick should be thoroughly wet before laying.

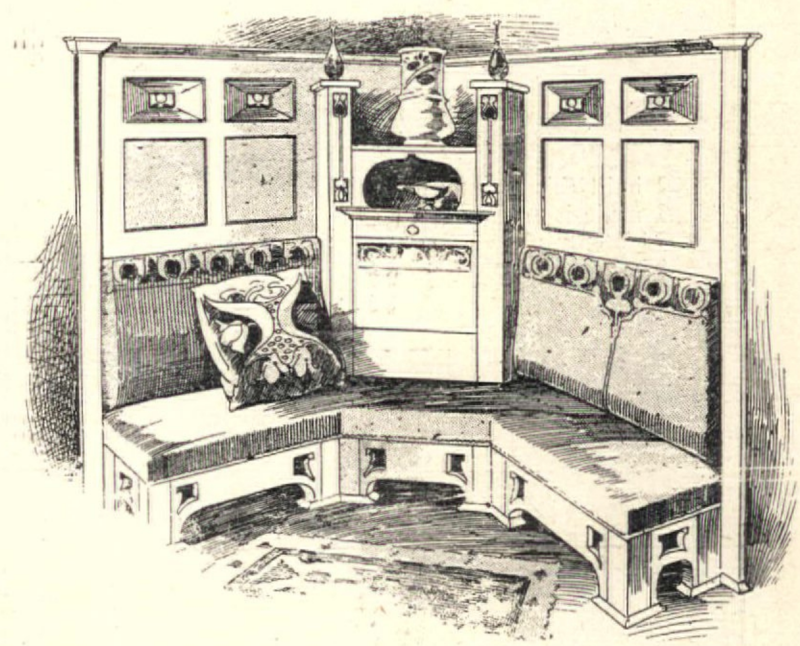
In sidewalks, as fast as the concrete is tamped to a surface the top coat should be spread on in order to bond the two layers together.

Ordinary lampblack injures cement mortar, mineral colors do not; sienna, Prince's metallic, Venetian red, Prussian blue, ground coal or oxide of manganese are good.

A MODERN "COSY CORNER," ENGLISH STYLE.

A COSY CORNER.

We have often been asked to publish designs of cosy corners, which would not require much cutting to fit up. The one we show in



the illustration is in the latest English style, and can be fitted up at the cost of a few dollars, as everything about it is plain, neat and economical. Any carpenter can make the seats, cabinet, and other work.

MOTTOES FOR THE FRONTS OF HOUSES.

The text is true, I trow, in every word.
He builds in vain who builds not in the Lord!

Dies schöne Haus ist Sand und Stein.
Wie werden die im Himmel sein.
Translation.
This fine house of stone you see,
What will those in Heaven be?

Though it a thousand years should stay,
This house at last must pass away.
And ere its shortest life be o'er
We shall have gone long, long before!

Stranger should this catch your eye,
Do a favor passing by;
Bless this house ere you be gone,
And it shall bless you—passing on.

If thou hast evil in thy heart,
Come not in, but straight depart.

In this house all that is good
Is welcome, be it understood.
Good for both, though—be it known,
Not for the good of one alone.
Good for thee

Likewise for me,
So shall we ever well agree!

This house I've built for me and mine,
May it be of peace a shrine,
And may no enmity or sin,
Ever find its way therein!

Enter if a friend thou be,
And if perchance an enemy,
With God's help then let us see,
If we two cannot agree!

If this house be fine or not,
That was ne'er my serious thought,
But it will have gained its ends,
Should I fill it full of friends.

As many bricks as in this house you see,
May friends receive its hospitality,
And when the counting of the bricks is o'er,
May we begin and reckon them once more.

If a welcome thou would'st win,
Wipe your feet, and then come in.

North, South, East or West
A man's own Home is ever the Best.

God shield this House from grief and fire!
And sin—no more need man desire!

I built this House of stone and wood,
I made it handsome as I could;
If it only pleases thee,
Then it need not better be.

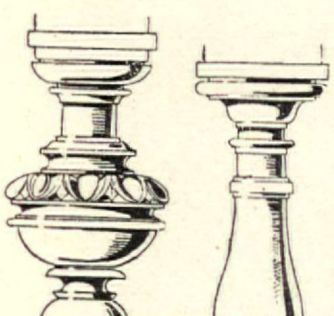



FIG. 90. FIG. 91. FIG. 92. F.G. 93.

WOOD-CARVING FOR CARPENTERS.

BY ROSWELL.

In closing these examples I have thought it would not be amiss to present to my readers a few sketches, mixed carvings and turnings, as there are many occasions in modern work where this style is in vogue. Newels, balusters, columns, pilasters, and other similar works in building, are often carved as well as turned; and in cabinet work it is quite a common sight to see the legs and feet of tables, chairs and other work, both turned and carved, and when tastefully executed and designed, the effect is striking and pleasing.

Fig. 90 shows two examples of turned and carved balusters or pedestals in German style. These are taken from "The Workshop" and are fine examples of the style. Fig. 91 shows a newel post in the same style, taken from the same source. This is rather a curious example, as it shows cut and carved brackets planted on around the neck and upper base.

Fig. 92 exhibits a panel in which carved, cut and turned work are shown grouped together; this is a striking example of German work. All the members are in high relief and project far beyond the face of the frame work. The turned work is simply one-half of the spindle.

The example shown at Fig. 93 is of Flemish design and is quite a handsome piece of work.

The two examples shown at Fig. 94 are English and are good examples for the carver. All of these designs may be employed for different purposes, particularly in cabinet work. They are also suggestive of other designs.

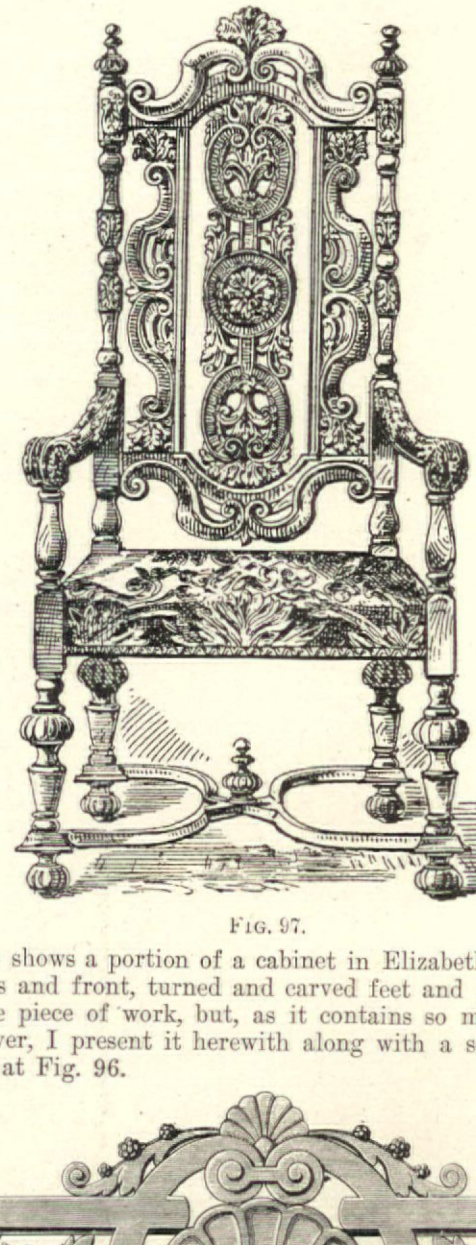


FIG. 97.

Fig. 95 shows a portion of a cabinet in Elizabethan style having carved doors and front, turned and carved feet and pillars. This is an elaborate piece of work, but, as it contains so many suggestions for the carver, I present it herewith along with a sectional view in larger scale at Fig. 96.

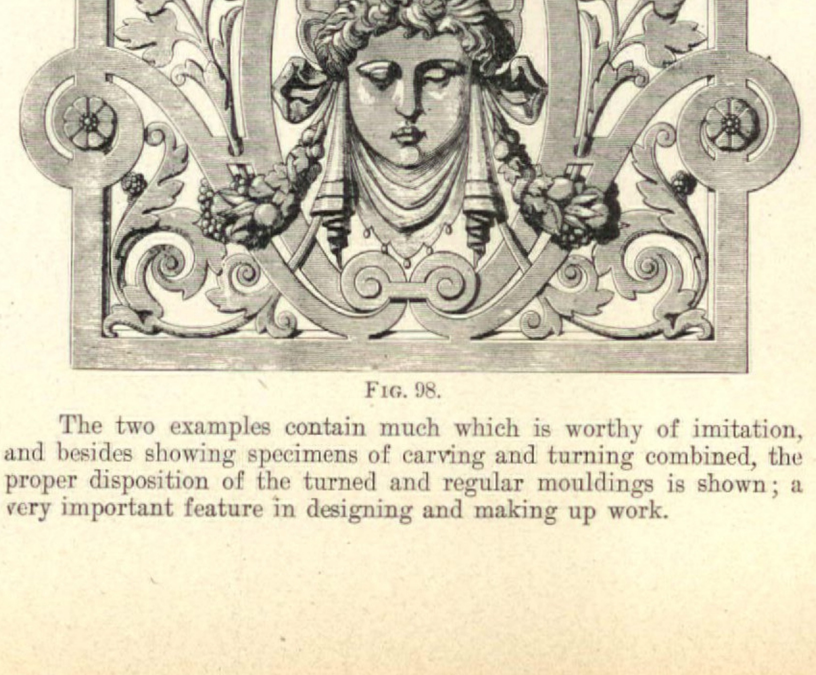


FIG. 98.

The two examples contain much which is worthy of imitation, and besides showing specimens of carving and turning combined, the proper disposition of the turned and regular mouldings is shown; a very important feature in designing and making up work.

An old Kentish chair, made in the sixteenth century, is shown in Fig. 97. Here we have a fine exhibition of carving and carved turned work. The legs, both front and back, show combined turning and carvings, and square faces where the rails are tenoned in the

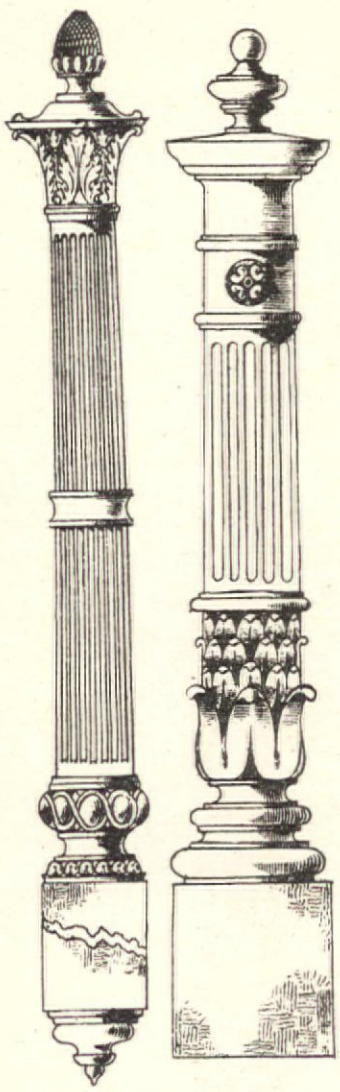


FIG. 94.

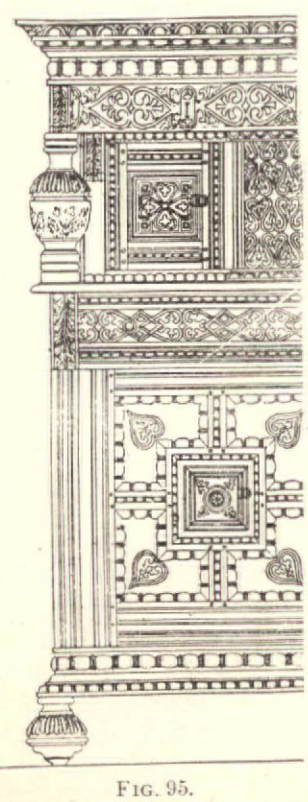


FIG. 95.

legs. The main posts on the back also show the same features. This chair was made of black oak, and is as black and as hard now, as though it was made of ebony.

At Fig. 98, I show a fine example of Austrian carving, recently executed in the city of Vienna. This is an open panel and was used in a desk back as a sort of a screen. It is a fine example, and tastefully designed.

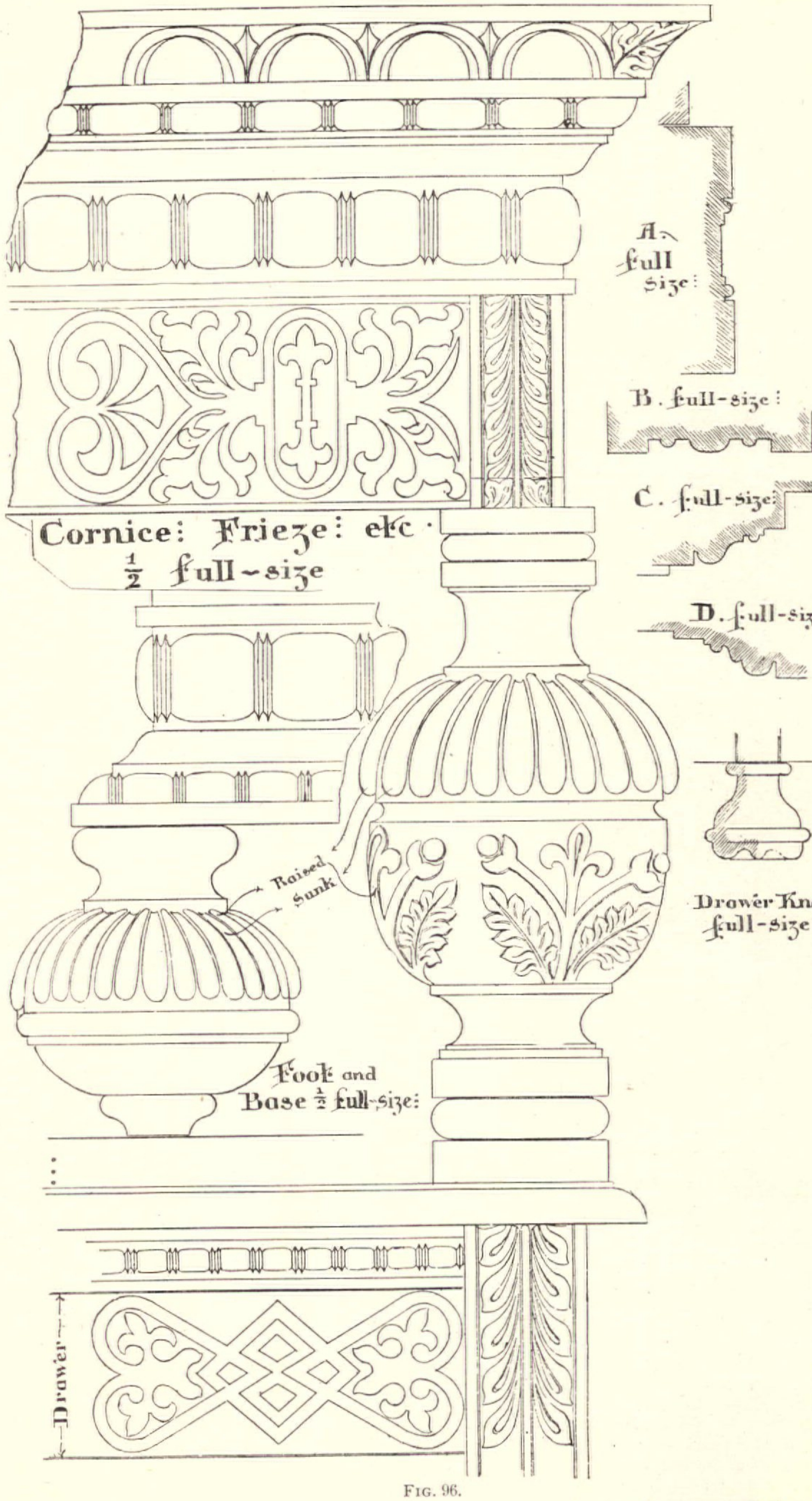


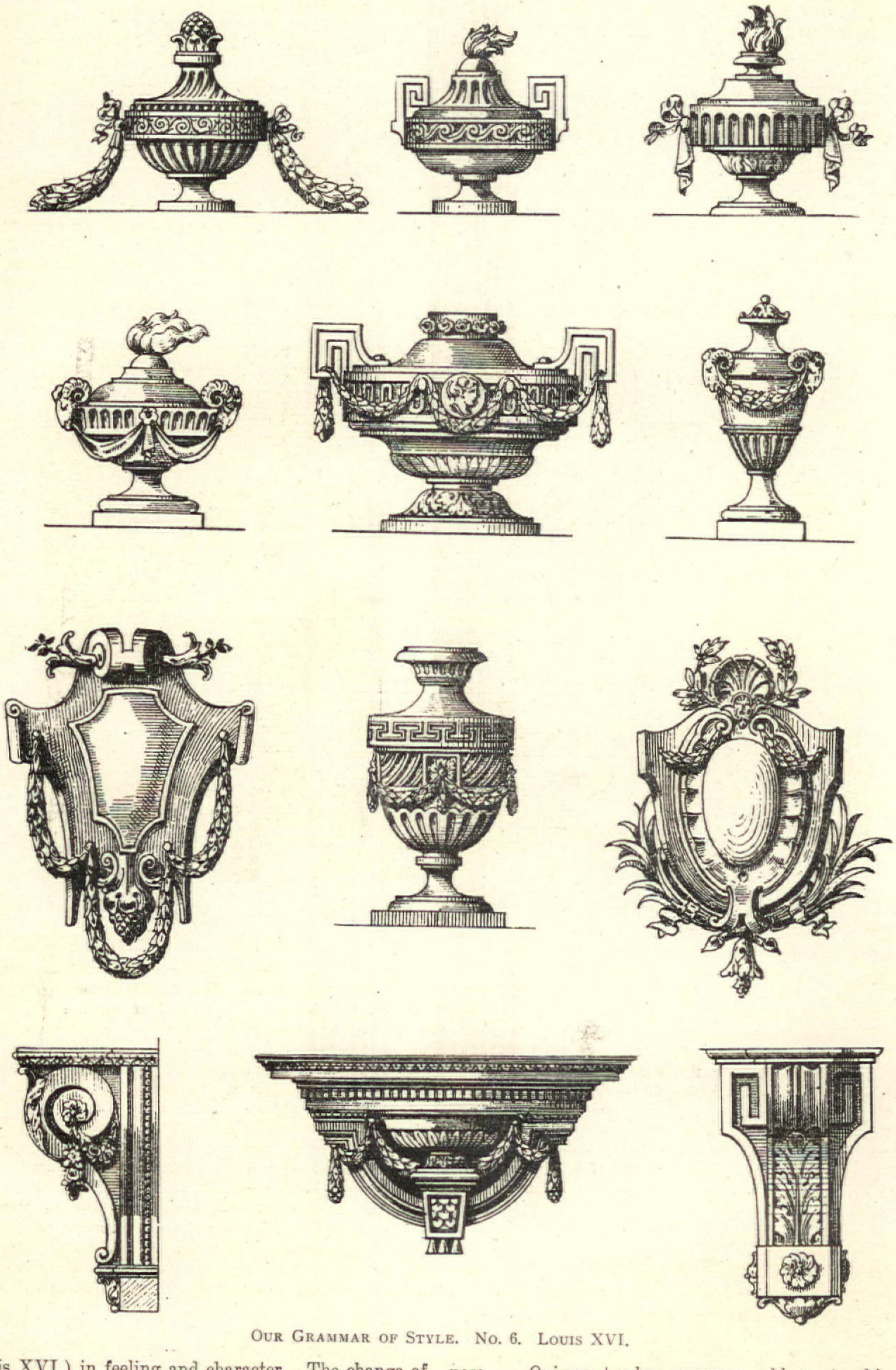
FIG. 96.

I now draw these papers to a close and hope my efforts to induce young carpenters to learn the art of carving, have not altogether been in vain. (Concluded.)

OUR GRAMMAR OF STYLE.

Louis XVI.

Strictly speaking, the term "Louis XVI. Style" should only be applied to the productions which originated during the reign of that unfortunate king, but such is not the case; for many articles designed and manufactured in the previous reign were quite Louis XVI, (or what is called Louis XVI.) in feeling and character. The change of taste from the extravagances of the Rococo to the refined simplicity of the style under notice really commenced during the reign of Louis XV., which fact renders classification according to reign very misleading. In our illustrations of this style, we have only selected examples which we consider possesses the true characteristics of Louis XVI. work, and these may be enumerated briefly as follows: Simplicity of outline, tasteful but sparing use of enrichment, and great refinement of detail. Gilt bronze mounts, Sevres plaques, and inlays of various woods, all served to embellish the cabinets and tables of this period, while even the productions of Wedgewood and fine lacquered panels from Japan were brought into requisition for the same purpose. Quivers, torches, amorous emblems, trophies, musical instruments and swags of flowers, favorite objects of decorative treatment with the designers of this date, and we find them constantly recurring in the panels of cabinets, in the bronze mounts, the Sevres plaques, and in various other places, sometimes with the happiest effect. The frequent introduction of vases, tripods, masks and other



Our Grammar of Style. No. 6. Louis XVI.

antique emblems are also characteristic of the style, and may be attributed to the discoveries at Pompeii and Herculaneum, which took place about this time. The French artists, however, were not satisfied with simply copying from the antique; they certainly borrowed old symbols, but they imparted to them invariably a French flavor, distinct and unmistakable. This antique feeling degenerated later on into the crudity and baldness of the style known as "Empire." The only redeeming feature in the work of this period is the extremely high finish and accuracy of detail which it invariably possesses, but it is utterly devoid of originality of invention; most of the ornamentation being a facsimile reproduction of Roman antiques.

Among the great French cabinet-makers and architects of the latter part of the eighteenth century, the names of Riesener and Gouthiere are most familiar, the former for cabinet work proper, viz., the wood-work; and the latter for the highly chased mounts with which the cabinet-work was generally adorned; but there were also many others of almost equal excellence. The South Kensington Museum contains some fine specimens stamped with the names of C. Richter, Oeben, Pafrat, Carlin, and other makers, whose productions will be admired long after their own names are forgotten. Jacquemart, in his "Histoire du Mobilier," also mentions the names of Martincourt, the master of Gouthiere, Delarche, Jean Louis Pricur, Vinsac and Ravrio as having assisted in bringing the metal-work of the Louis XVI. period to the state of perfection to which it ultimately attained.

We have sketched on the accompanying illustrations a few familiar details of the style under notice. Among these the Vase plays a prominent part. We find it constantly introduced, in the inlays, in the bronze mounts, and in carved wood, sometimes containing flowers and very frequently terminating with a flame or ornament in the form of a fir cone. The handles of the Vases generally take the form of a Greek key, and from these are suspended swags of laurel or drapery.

Examples of Vases such as we have described are shown on the illustrations, also two characteristic Shields of carved wood in the Louis XVI. style. The truss and bracket on the same illustration have been taken from eighteenth century work, and are strictly in character with the style of Louis the XVI.

ROOFING RECOMMENDATIONS.

A little folder that a Baltimore firm are sending out contains some important points in pithy paragraphs, under the head of "Perfection in Tin Roofing," which, while applying directly to their own products, will be of interest to the roofing trade in general. Among the points given are the following:

It is just as important to have a first-class, substantial roof on a building as it is to have a solid foundation.

The first cost is the prime factor. It costs no more to put on good tin plate than it does a cheap article. Use nothing but the very best brands of roofing plates.

As a protection to the tin and a preventive of noise, put good roofing felt or paper under the tin.

Use only the finest solder. It takes less material, less time, holds faster, makes the strongest job, and is the cheapest in the end.

Have the seams well soaked with fine solder and allow no acid in soldering, but use rosin only.

Have each sheet well cleated to the roof, with not less than four cleats to a sheet 20x28 inches.

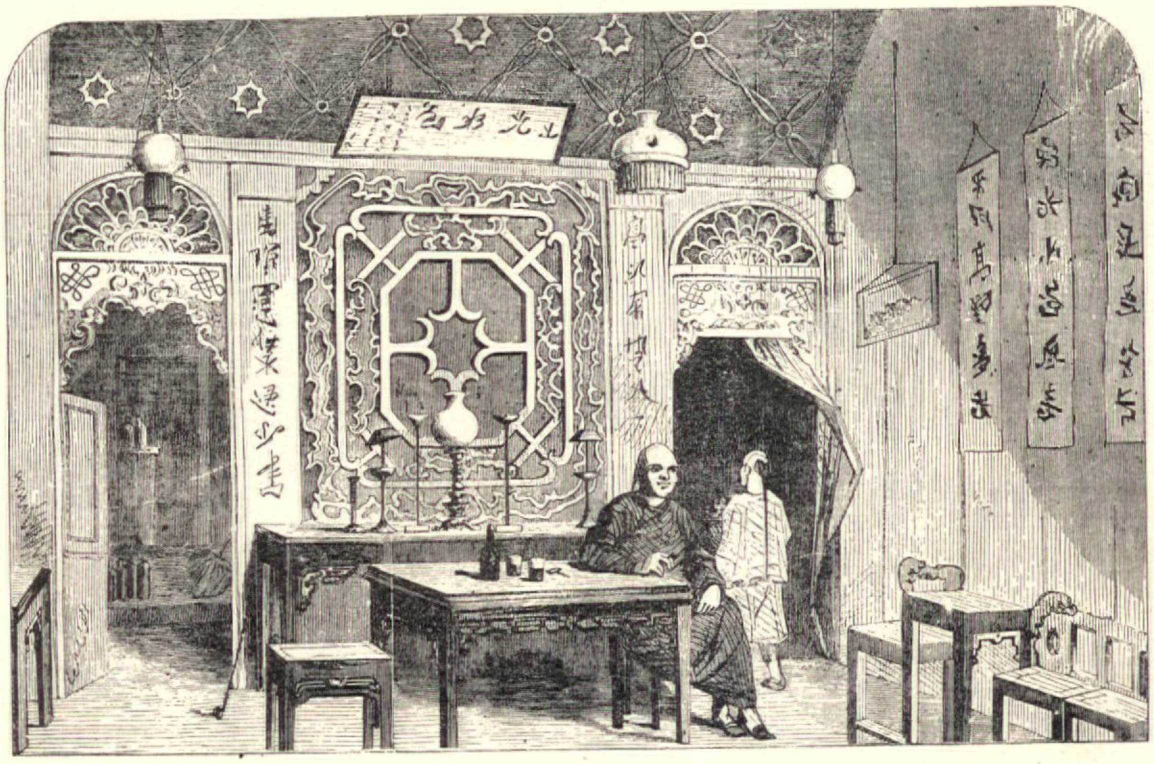
Paint all tin underneath and as soon as the roof is on thoroughly apply one good coat of paint. In a month or two afterward give it another good coat which will last for several years.

It is a great mistake and injurious to any metal roof to allow the coating to be scratched off and the tin rusted before painting. You paint wood to preserve it; therefore paint the roof when finished.

Select a first-class roofer, one whom you know will do good work and is responsible.

If possible, prevent walking over a tin roof with shoes with nails in, as they dent and scratch the metal. Do not allow boards filled with nails, plaster or bricks and mortar to be dragged over or thrown on the roof after the tin is laid.

If the above instructions are carefully followed and the best brands of tin are used and put on properly by approved methods, you have a tin roof that will last for fifty years.



Interior of a Chinese Room.

INTERIOR OF A CHINESE HOUSE.

The illustration shows a Chinese room with some of the interior furnishings. Everything in a native house is the perfection of neatness; everything is in its proper place, and beautifully clean. We do not know a nation equal to the Chinese for their tidiness. The ornaments of the room are quaint, but very pleasing. The native merchant is sitting down smoking his cigar. The walls are covered with paintings and writings, the latter being extracts from the sayings of Confucius and other wise men of China, and nearly all convey some moral lesson or some economic saying. The better class Chinaman at home is a perfect gentleman, hospitable, generous, courteous and extremely agreeable, and generally better informed than we give him credit for.

This illustration simply shows a sort of living and reception room, but the better rooms, such as we would call a parlor, are richly furnished, some of them dazzling with oriental magnificence. Rugs and mats being heavy and velvety, and the ornaments of bronze, porcelain, ivories and carved ebony, are beautiful indeed.

Experiments to test the efficiency of acetylene as an illuminant for lighthouses have been made in the harbor of Genoa, Italy. The apparatus used consisted of four separate generators, and for a period of 100 days of ten hours each the lighthouse was served with the new gas with satisfactory results. It is asserted that while the Tino electric light, which is forty miles distant from Genoa, could never be seen from there, the Genoa acetylene light was quite visible at Tino.

THE HENNEBIQUE SYSTEM OF ARMORED CONCRETE CONSTRUCTION—PART V.

BY LEOPOLD MENSCH, C. E., FROM I SURANCE ENGINEER.

The lower room was completely filled with wood and coal, the upper room partially filled with the same materials, and the roof was loaded with 200 pounds per square foot. At 4:06 the fire was lighted on both piles and lasted until 6:30. The fire played so fiercely against the sides and ceiling that the plastering of the latter was calcined, and the wire glass of the windows and doors melted.

The building was momentarily forced out of shape (expanded) but showed no cracks and only very fine fissures, which in no case let the hot air escape. Again the contact of the hand with the outside of the walls could easily be endured. The deflection of the second floor reached a maximum of ¾ inch at 5:40; after this time no further increase could be observed.

At 6:30, when, after continual firing, no change in the state of the building could be detected, the commission agreed to extinguish the fire, which was done by directing a stream of water from a hose against the walls and ceiling and afterward against the coal piles.

When, on the following day, the fire authorities examined the building, it was found that the conflagration had not injured the general structure in any way. There was no permanent set in the floors and the few fissures caused by the expansion were completely closed. A series of pyrometers indicated a temperature of 2,200 degrees F.

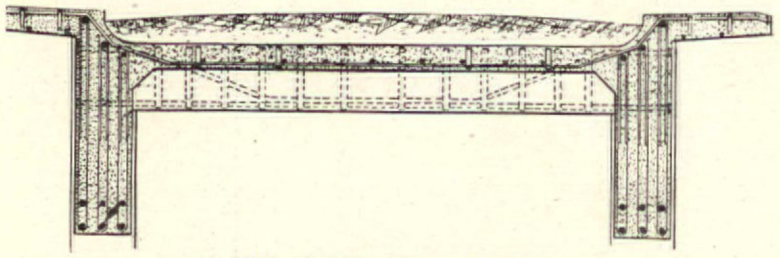


FIG. XVII. CROSS SECTION OF A BRIDGE.

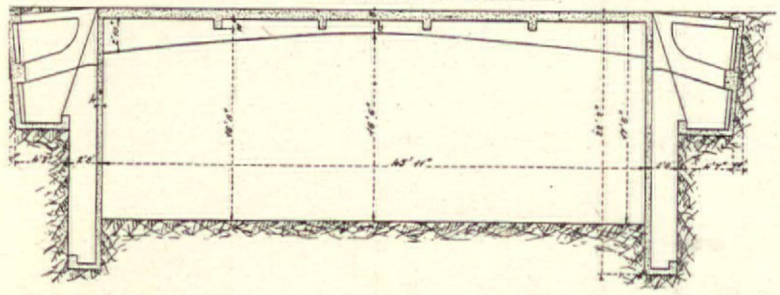


FIGURE XVIII. LONGITUDINAL SECTION OF BRIDGE OVER THE QUAI DEBILLY, PARIS.

Lime kilns, constructed entirely of concrete, dispensing with fire bricks and steel shell, have endured for years a temperature of 2,200 degrees to 2,500 degrees F.

From every point of view armored concrete buildings are superior to those of any other type. They are monolithic; settlement of the ground is properly transferred and equalized by means of their enormous stiffness; they consist of practically one material, and variation of temperature cannot produce unsightly cracks; they become stronger with age, concrete forming an artificial stone better than the best stone which ever came from a quarry; the buildings are cool in summer and warm in winter.

Considering, moreover, the facility with which the materials can be procured, so that only a few months are needed to erect the largest building, together with the surprisingly low cost, it must be evident that the time of steel skeleton buildings, with all their flimsy lug and bracket connections, their insufficiently protected columns and their high cost, is past and that they must give way to a far superior type which will be the construction of the twentieth century.

The photographs show the great range of work done by Mr. Hennebique, including factories of all kinds, as flour and spinning mills, ice factories and foundries with heavy traveling cranes, the runways being also of concrete steel, smokestacks, storage houses and power blocks, apartment and office buildings of fifteen stories in height, department stores, theaters, museums, banks and fireproof vaults, domes and churches, markets, railroad stations and small switch houses, free supporting staircases, floors of any practical span (those in the Grand Palace of Fine Arts in Paris having a span of 33 feet and a cantilever of 11 feet), exhibition buildings, coal-bins, water-towers, grain elevators, power and irrigation canals, tunnels, retaining walls, wharves and piers, and (last, but not least) bridges.

Armored concrete bridges are indestructible, requiring no supervision or repairs. If of moderate span, they are cheaper than steel bridges and have always a fine architectural appearance.

Through the columns of Engineering News, of this year, we have learned the disastrous results of adopting the so-called "leg bridges" for country roads. They consist of steel piles, forming the abutments, and plate or lattice girders carrying the floors, the two being connected by brace angles. They failed by scores. A few concrete-steel piles and a 4-inch curtain wall as abutments, a few armored concrete piles mid span and a concrete steel floor, monolithically connected with these piles, will make a bridge as cheap as a "leg bridge," but far better and indestructible.

Figure XVII. shows a typical cross section of a ferro-concrete bridge of moderate span. The floor of the roadway and the cantilever sidewalks form the compression flange, while the rods in the bottom of the girders proper form the tensile flange of a huge girder, and, for the same reason as in floors, this type of bridge is much stiffer than are plate girder bridges. The cross girders, roadway and sidewalks are all built of ferro-concrete.

(To be continued.)

BITS FROM THE EDITOR'S SCRAP-BOOK.

The five examples shown in this illustration are excellent specimens of stone carving. They are also good examples for wood carving and may be copied with profit. They also offer suggestions in drawing and design, and, as they are acknowledged to be in the best of taste, a study of them will most assuredly elevate the taste of the young student.

German scientists and financiers are busy with peat fuel owing to the dearth of coal. A company in Oldenburg has taken up an invention which claims to reduce peat to coke suitable for all technical purposes. The amount of carbon contained, its great hardness and freedom from sulphur, make it specially suitable for use in furnaces. It can also be used in machine factories, copper and brass smelting works, and in soldering and welding operations.

METHODS OF MAKING CONCRETE.

E. S. Gould states that first-class concrete, as far as manipulation is concerned, may be made in several different ways, all of which, however, must possess the common attribute of a thorough and intimate intermixture of the ingredients. He says:

Upon the whole I think that as good a way as any is to mix the cement and sand dry (this should always be done), and thoroughly drench the broken stone with water and then mix stones and mortar together without further addition of water until the mass has been well turned over. Then, while continuing the mixing, add water (by sprinkling, not dashing) until the proper fluidity has been secured. This depends upon circumstances. In a very wet foundation pit of small area good results may be obtained by pumping vigorously up to the last minute; then pulling out the pumps and quickly shoveling in the concrete without any further admixture of water, merely leveling it off and allowing the water to rise and percolate through it. It will soon get quite wet enough and can be settled in place by gentle ramming.

I think the throwing of large stones in a mass of concrete is always detrimental to the work, which should be as homogenous as possible. When time is an object it is sometimes permissible to use them so as to get on faster, but the quality of the work is never benefited by it. On the other hand I believe it is often improved, particularly when using very wet concrete, by spreading here and there a layer of the broken stone used for the concrete and beating them well in. It is sometimes—perhaps generally—considered that the richer the concrete is—that is, the smaller the dose of broken stone—the better the result. I am convinced that this is a mistake, and that if the stone is hard and sharp the more of it that can be rammed in the better, provided that the pieces are thoroughly coated with mortar. The reason is that the stone is stronger than the mortar, the only object of the latter being to fill the voids and bind the stones together. Of course, this requires great judgment and a competent and faithful inspector, or the license would be grossly abused when the work is done by contract.

Writers on the subject of concrete making do not dwell sufficiently upon the after treatment of the material. The work is not finished when the concrete is made, mixed and rammed. All exposed surfaces must be kept constantly and thoroughly moist for an indefinite period, the longer the better. The top surface of a concrete foundation must be kept wet till it is covered by the superstructure.

BUSH TEMPLE OF MUSIC, CHICAGO. J. E. O. PRIDMORE, ARCHITECT.

BRICK WALLS FOR DWELLING HOUSES.

It is the common practice to use salmon brick in all inside work of walls for dwelling houses, says J. W. Crary, Jr. Then these walls are "furred" and "lathed," so that the plastering will keep dry. Now, this is a great blunder for a wise builder to make. A 9-inch wall, built of good hard brick, in the proper way, wthout "furring," is better than a 13-inch wall built in the common way with it. If the brick are hard and strong, and laid well in the best kind of mortar, the inside course can be set on edge, three courses on edge, then a "header" to bind. This leaves a hollow space between the outer and inner part of the wall, which is a complete non-conductor of heat, cold or water from the outsde part of the wall. Not only that; the expense and nuisance of "furring" and lathing is avoided, and the plastering is put on the brick, and, while adding strength to the wall, is as dry as if put on "laths."

[The editor does not hold himself responsible for the opinion of correspondents Short crisp letters will be appreciated. To insure publication, the name and address of the writer must accompany the communication, not necessary for publication. Sketches of work or methods will receive our earnest attention. These coulmns are open to our readers at all times without charge and any questions or experiences will be given proper space —Ed.]

ANSWERS.

From "Architect," Buffalo, N. Y.: In making answer to the query of G. C. K., Elkhart, Ind., I may say that there is no American work that I know of, devoted altogether to estimating the cost of material and labor of stone-cutting or stone-work generally. Trantwine gives some prices, so also does Haswell. Kidder gives very little on the cost of stone-work. Ira Baker's work on "Masonry Construction," contains a chapter covering some seven or eight pages on the cost of stone-work generally. This is excellent as far as it goes, but does not cover ground enough. Each of the books mentioned above are costly. the price of each being not less than $4. A little book published by the David Williams Company, New York, entitled "Estimating Brick and Frame Houses," and costing one dollar, is a very good work on estimating, and gives some figures on stone-work. There are a number of English works which give prices of material and labor of all kinds of stone-work, cut and otherwise, but they are not adapted to American figures, or American practice.

From "Old-Mason," Dayton, O.: G. C. K., of Elkhart, Ind., should get a copy of Hodgson's "Estimating Brick and Stone Houses." I got one from NATIONAL BUILDER office, and I wouldn't be without it for a cow.

From Wm. T. D., Chicago, Ill.: If G. F. H., New Marion, Ind., will write "The Fairbank's Scale Co." of this or any other large city, and tell them just what he wants to know; he will get better and more reliable information from them than he can get through this correspondence.

From "Bricklayer," Cleveland, O.: Replying to "Builder," Toronto, Ont., if he cleans off the mortar from his old bricks and wets them well before using, the chances are he will have a wall as good, if not better, than if he used new bricks altogether, as most of the "softs" or "salmon" bricks will have been destroyed or picked out in the taking or throwing down of the old wall, and the bricks that stand this test will be of a good quality; better than the general run of bricks from the kiln. The difference in laying old bricks will not amount to more than 10 per cent, generally not so much. This, of course, means after the bricks have been cleaned of mortar and stacked up. The extra increase of cost in laying old bricks is chiefly because their being more or less corners broken off, or patches of mortar left here and there that must be removed before laying.

Mortar for laying old bricks does not require to be quite as stiff as for new work. The quantity of mortar required will be about the same as for new work. With regard to colored mortar, much depends on the state of the old bricks. If they are clean and of good color, then a good red or black mortar would enhance the general appearance of the wall; but my experience has led me to believe that the better way is to lay the bricks with ordinary mortar, making fine joints which may be beaded or cut bevel, then stain, or better, paint the whole work over in some suitable color, after which the joints may be lined off with white or other color to suit the taste. As a rule, a wall built of old bricks is better and stronger than one built of new, providing the work is well done and the brick not too old or weathered.

From "General Contractor," Springfield, Ill.: In answer to "Young Plasterer," St. Paul, Minn., I will give him my experience on the subject of cement cornices. I assume that the cornices in question are to be executed in Portland cement, and in that case, whether inside or out, they can be finished quite smooth and sharp, so as not to require any troweling whatever. For an outside cornice, having got the mould ready, cut out a sheet iron template to the same design, only a little smaller, so as to show about $\frac{1}{4}$-in. all round. This is nailed into the mould. The running laths being in position and ready, make up a gauging of cement and coarse sand, 2 to 1. When this is mixed and softened, apply a thick coat to the wall and press bits of broken brick, etc., well into it; then coat again, and so on until the gauging is brought out to the template, and rough enough to form a good key for the subsequent coat of fine cement. Then take off the template. At this stage it will be well to study the setting properties of the pure cement so as to be able to judge the quantity of moulding that can be run in the day's work. It would be well for an inexperienced hand to start with the fine coat early in the day, as this would give him every chance to watch his work, which, if engaged otherwise, he may do by paying periodical visits. A little more pure cement than can be applied in one coat having been mixed, the surplus is left on the mortar board, and when this coat has gone in or partly set, make up some more cement and mix the surplus through it; which being half set and softened again, will render the cement as gauged quite fatty. Continue adding surplus to fresh gauge until the moulding is finally run off, when it should be so sharp and the arrises so smooth that the plaster moulds could be taken from it. The same method may be adapted for the inside work. I have to thank THE NATIONAL BUILDER for many benefits I have gained by reading its columns, and I wish it the success it surely deserves.

From "Decorator," Chicago, Ill.: My advice to "Young Painter," of Racine, Wis., is the same as "Punch" gave to the young man who asked "Punch" if it would be wise for him—the young man—to get married. "Punch" replied: "Don't"—that was all. If Young Painter has never done any enamelling or seen it done, then "Don't." If, however, he has any knowledge whatever of using enamelling, then the following will help him very much if followed closely:

The woodwork sandpapered, knotted and stopped with white lead putty, and then given two coats of genuine white lead mixed to a working consistency with equal parts of raw linseed oil and turpentine and a little patent driers. Each coat should be thoroughly rubbed down or flatted, in order to remove any inequalities until the work assumes a solid appearance. The work should then be given a coat of pure zinc-white mixed with two parts of pale boiled oil and one part turpentine, with a little patent driers allowed abundance of time to harden, and rubbed lightly over with No. 0 sandpaper, then dust well, and apply a coat of finishing white enamel, which should be obtained from some reliable dealer. The finish depends very much on the preparation of the ground. For some classes of decoration, six or eight coats are given before the enamel is applied, the first coat of which is sometimes flatted, the second coat being the finishing coat. Further, while paint for ordinary inside purposes may be mixed as follows: Genuine white-lead, 13 lb.; patent driers, 1 lb.; raw linseed oil, 1 pint; turpentine, $\frac{1}{4}$ pint. Terebine is not recommended for white paint. Paper varnish is very friable, and is not durable. A colorless copal varnish, white enamel varnish, or French oil varnishes are most suitable for varnishing white or delicate colors.

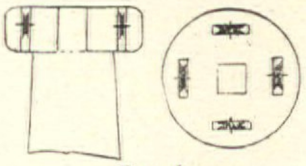


FIG. 1

From an "Old Ship Carpenter," Brooklyn, N. Y.: It pleases me to see that there is one true citizen in South Bend, Ind., who desires to see "Old Glory" floating over his head, and I go a little out of my way to help him make provision for this purpose. A good flag-pole should consist of a carefully selected Norway pine, free from knots and flaws, straight and well grown. It should have a diameter of from $2\frac{1}{2}$ to 3 inches at the top. The method of fixing must depend largely on circumstances, but the pole may in this case be easily secured to the back of the gable by irons built into the brickwork at two or three points—the top one being as high as its proper fixing into the wall will allow. A footstep may be formed if desired by corbelling out two or three courses. Wire stays should be provided to a high pole, and in this case two such stays may be employed to anchor on to the main roof if thought necessary. The top of the pole is secured to the truck by a mortise joint, and the latter (which should be of a tough piece of flawless oak, elm or ash) is furnished with small (of 1 inch or $1\frac{1}{4}$ inch diameter) groove pulleys (one for each flag it is desired to hoist) fixed vertically in slots carefully cut for their reception, and as shown on the accompanying sketch plan and section, Fig. 1. Each slot is cut so as to just miss the staff, and the groove of the pulley is only just wide enough to take the line it is proposed to use. The halyards are not taken away when the flag is lowered, but remain on the pole, their lower ends being wound round cleats provided for the purpose.

From R. W., Auburn, N. Y.: In answer to "W. B.," Nashville, Tenn., I submit the following for describing a Moorish arch: Let A, B, Fig. 2, be given width of arch, and D, C, the given height.

At A and B erect perpendiculars, and make angles D, C, H, and D, C, G each equal to half the vertical angle.

Make D, E equal B, D, and D, F equal to perpendicular height from G or H to C. Conect A, F, B, and divide the lines A, G, H, B, A, F, and F, B each into an equal number of spaces, as five.

From points 1, 2, 3, 4, on lines A. G, and B, H, draw lines to C; and from the point E draw through points 1, 2, 3, 4 in A, F, and F, B, intersecting 1 C, 2 C, etc., and through the intersections draw the curve.

From "Old Hand," Louisville, Ky.: In reply to "Young Painter," Racine, Wis., I send the following for white enameling:

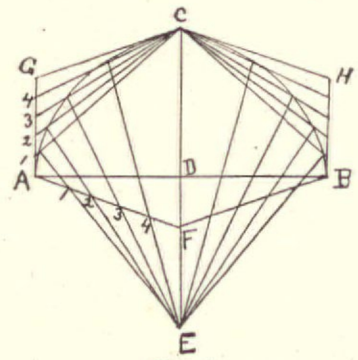


FIG. 2.

Carefully remove all inequalities from the work with No. 0 sandpaper, then apply two coats of zinc white priming paint, which is made by mixing together 2 lbs of zinc white ground in turpentine with 10 ozs. pale japan gold size and a little turpentine to reduce the paint to working consistency. When the work is dry and perfectly flat or smooth, apply a coat of best white finishing enamel. The gold band may be run in with a coach painter's sable liner brush, using gold bronze paint. If a better gold finish is required, gold leaf may be used in the manner described below. Allow the enamel about four days to thoroughly harden, then make some egg size by beating up the white of an egg in a glass of cold water; coat the enameled surface with this size, using a clean brush, allow a few minutes for the size to dry, and then dust it over with French chalk, using for the purpose a soft pad. Paint in the lines and other decorative work with gold size, then apply the gold leaf. Allow sufficient time for the gilding to harden, then sponge, which will remove the French chalk and egg size and leave the gold leaf intact. As the chairs may be handled, give the gold leaf a coat of gelatine size in order to prevent tarnishing.

From "Sanitary Student," Philadelphia, Pa.: In answer to "Contractor," of Scranton, Pa., regarding cesspool, the size of the

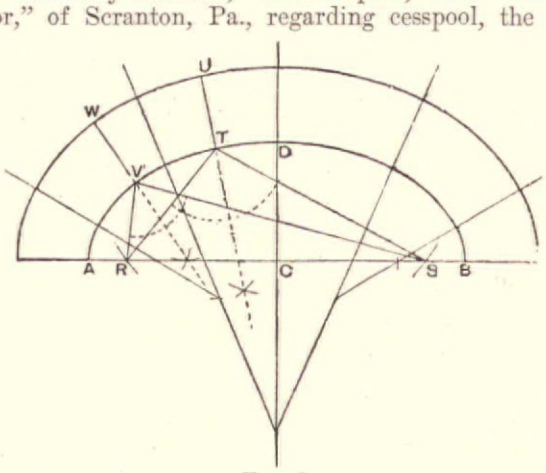


FIG. 3.

cesspool will depend upon the size of the cottage for which it is to be provided and the number of occupants the cottage will accommodate and, again, upon the frequency of the periods of emptying. A cesspool should be emptied, at the very least, once in three months. According to a well known sanitarian, twelve gallons per head daily should be taken as an average, then, if the cottage accommodates four persons; this will be forty-eight gallons daily, or in twelve weeks 4,032 gallons, and taken six and a quarter gallons to the cubic foot, the cesspool would be required to have a capacity of 645 cubic feet or thereabouts. The cesspool should be built circular in shape, of good hard bricks, set in and preferably faced with good Portland cement mortar, covered with a hermetically closed lid, and suitably ventilated. Should be pleased to assist you further.

From "Architect," Buffalo, N. Y.: In reply to W. B., Nashville, Tenn., it may be said that there are many ways by which the joints for brick work in an elliptical arch may be struck, but few are correct. I present one herewith which is pretty nearly correct, and will give good satisfaction. Set out the springing line A B to specified span, Fig. 3. Bisect the springing line in C and erect a perpendicular C, D, which should be equal to a given rise. Construct a rectangle by means of lines A E drawn parallel to C D, and D E drawn parallel to C A, and intersecting in E. Trisect A C and A E. Produce C D to F, making C E equal to the rise C D. Draw lines from the points of division G H in A E to the point D, intersecting at I J other lines drawn through the points of division K L in A C from F. The points of intersection I J will be points contained in the curve of the arch. Bisect J D and continue the bisection line to meet C F produced in M, and join M J Also bisect I J, and continue the bisection line to meet M J in N. Draw N O parallel to A B. From N with radius M J describe the arc J O. Join O A, and produce O A to meet the arc O J in F. Join the point of meeting P and the point N intersecting A B in Q. Now that the centers Q N M have been obtained, half the complete elliptical curve can be drawn. From M as center, with M D as radius, describe the arc J D; from N as center, with N J as radius, describe the arc I J; and from Q as center, with Q I as radius, describe and arc I A. This completes the curve. The other half of the elliptical curve can be drawn by simply transferring the centers.

The following simple method of obtaining the joints of a semi-ellips arch may be useful taken in conjunction with the above. Take the distance A C Fig. 4, as radius, and D S center describe arcs cutting the line A B in R S. Let T be a point in the curve, and join T R and T S. Bisect the angle R T S, and draw the line T U, which will be the joint required. In the same way any other joint may be found, such as V W; or the joints may be drawn from the centers,

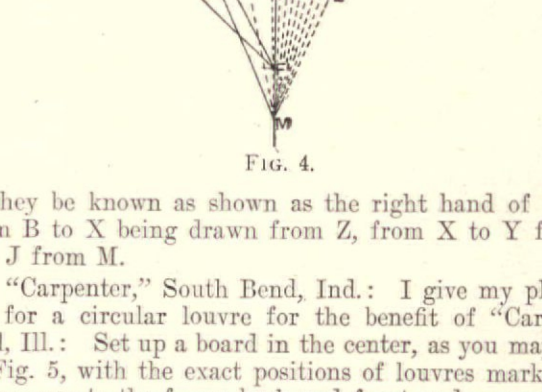


FIG. 4.

provided they be known as shown as the right hand of Fig. 3, the joints from B to X being drawn from Z, from X to Y from Z, and from Y to J from M.

From "Carpenter," South Bend, Ind.: I give my plan for getting slats for a circular louvre for the benefit of "Carpenter," of Springfield, Ill.: Set up a board in the center, as you may see in the diagram, Fig. 5, with the exact positions of louvres marked upon it. Then square over to the frame back and front and you will not only get the frame accurately set out for the housing, but also the lengths of the louvres and end bevels, measuring, of course, from a center line corresponding to the center board. After all is marked off, you knock out the center board.

From "Mechanic," Cleveland, O.: "Economy," of Dayton, O., had much better buy new files than try to sharpen his old ones by any chemical process, for such files are worthless, that is, if they have been much worn; the acid merely eats away the gum, or loose particles of iron from between the teeth, making them look better, and nothing more. Old files may be re-cut by hand, and be as good or better than when new; the temper is first drawn, they are then ground smooth, re-cut and tempered. They can be re-cut for less than what new ones would cost.

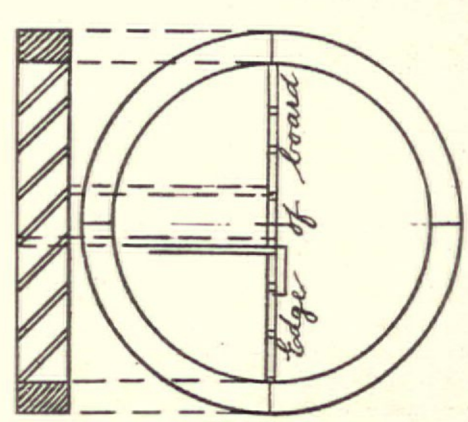


FIG. 5.

From "Crimson," Reading, Pa.: J. M., New York City, is referred to April number, 1900, of THE NATIONAL BUILDER, for a good explanation of "blue prints" development. He will get there pretty near all that is known about making blue "prints" with diagrams of the appliances required for making them. The description is by Mr. Fred Riessman, of West Point, N. Y., the inventor of Riessman's Polygon and Rafter scale. I think you can get a copy of the paper at the NATIONAL BUILDER office if you haven't got it on your file. The article, I believe, first appeared in Carpentry and Building, and if you cannot get a copy of April number of NATIONAL BUILDER, you might, perhaps, get a copy of Carpentry and Building which contains the article and illustrations. For the properties of steel I think J. M. should consult some one of the many works on the chemistry of metals; it would take several pages of THE NATIONAL BUILDER to give even a brief outline of half the properties of steel.

From "Old Stair-Builder," Philadelphia, Pa.: M. C., of Akron, Ind., should keep all his strings and "horse," or carriage pieces paralleled in width. If he does this, he will have no trouble in getting a regular soffit under his stairs. In framing the carriage, where there is any overwood it should be adzed off after the timbers are in place. Of course, M. C. does not give much data, so it is impossible to give directions that will just suit his particular case. With regard to the stresses he speaks of, as described in December number of this paper, 1902. I have not the matter in hand, so leave that part to be answered by some correspondent who knows all about it.

NOTE.—In answer to L. O., of Rockdale, Wis., we publish and illustrate a cheap wooden lathe article on another page.—(Ed.)

QUESTIONS.

From "A. A. C.," Bloomingdale, Ind.: I would like to ask of my fellow readers their opinions regarding the quality of "plane stocks." Which is the best and most lasting wood for the purpose, beech, or apple wood? I see that apple wood is listed in price catalogues higher than beech, though the latter wood is most used. Can the readers of this paper who have tried them, recommend the Gage plane, made by the "Gage Tool Co., Vineland, N. J.?" I have found nothing yet that beats the old fashioned beech plane.

From "W. B.," Newark, N. J.: I am engaged to finish and color a "den" or study for a young lawyer, in which there is already, a dado that is heavy in appearance, being finished almost in black. The room is fairly lighted, and is about 12x16 feet on plan, and 13 feet high; and I am desirous of giving the whole a cheerful and cosy appearance. Will some reader please advise me?

From "V. J. B.," Bagley, Ia.: I am in want of information regarding the quantity of Portland cement required for a given area, also the proper proportions of cement, gravel, and sand for concrete and sidewalk work generally, and will be pleased to hear from some of your many readers, on the subject.

From "Willis," St. Louis, Mo.: Which is the best way to remove old whitewash or limewhitening from a red brick wall? There are several coats on the wall, and I am anxious to remove them so as to harmonize with the wall above, which has not been whitened.

From "J. S.," Superior, Wis.: What is the best way to cover steam pipes laid in very damp, moist soil. Cold spring water around them condenses the steam as fast as it flows in.

From "Petersburg," W. Va.: Will some "old painter" who knows, tell me what is the best to do with a nice job of grained doors, that have stood for about eight years, as I want to renovate them and make them look fresh and bright? Any information will be appreciated.

From "J. T.," Nashville, Tenn.: Will some one please advise me as to the best way to make concrete steps and sills? Oxide of iron is to be added to the other ingredients for coloring purposes.

From "Builder," Port Huron, Mich.: Would like to have the opinion of fellow readers whether or no a "Porcelain" bath is preferable to enameled iron one? I wish to make use of quite a number of baths this season, and as there are some doubts as to which is the better bath, would like to have the opinions of experts before I decide which kind I will make use of.

From "Young Carpenter," Eastern, Pa.: I have a country church to finish up with beeswax polish instead of varnish, and would like some hints as to the best method of doing the work.

From "Finisher," Atlanta, Ga.: How can I finish up cypress in natural colors to the best advantage?

From "Bricklayer," Scranton, Pa.: I have seen a number of questions in this paper regarding laying out wooden window frames with circular heads that were to suit a circular tower; I now wish to ask how a center can be made for brickwork in a circular tower with a semi-circular head. This is what I suppose is called "double curvature."

From "Beginner," Campton, Cal.: How can I remove old varnish from furniture that I wish to hand polish? What is "Lac" spoken of by an "old Polisher" in November number? Druggists here do not seem to know anything about it.

From "G. P. S.," Berea, Ky.: About six months ago, I finished the brick and stone work of a handsome school building and left it in charge of the carpenter. During the winter it was covered with green chestnut shingles and as the warm spring rains came the acid from the chestnut ran down the corners, (where down pipes should have been) and has stained both brick and stone so as to ruin the beauty of the building. Can this stain be removed and by what means? I may add that the stones are blue lime stone. I should like this matter brought to the attention of other builders, as it would no doubt benefit others as well as I. Should this appear in the correspondence columns of THE NATIONAL BUILDER it will be appreciated.

A CHEAP HOME-MADE LATHE.

BY R. E. R.

In reply to L. O., of Rockdale, Wis., we publish the following which is taken from Work, an English journal of repute:

In the construction of the 5-in. center lathe shown in Figs. 1, 2 and 3, wood has been introduced as much as possible to enable Work readers to make a cheap and efficient lathe either for wood or metal turning. Much of the metal work could be done at home, while the bolts, nuts, washers, etc., can be obtained at the ironmongers. A blacksmith would make the square crank-shaft, and cut and drill the metal caps for the bearings, etc.

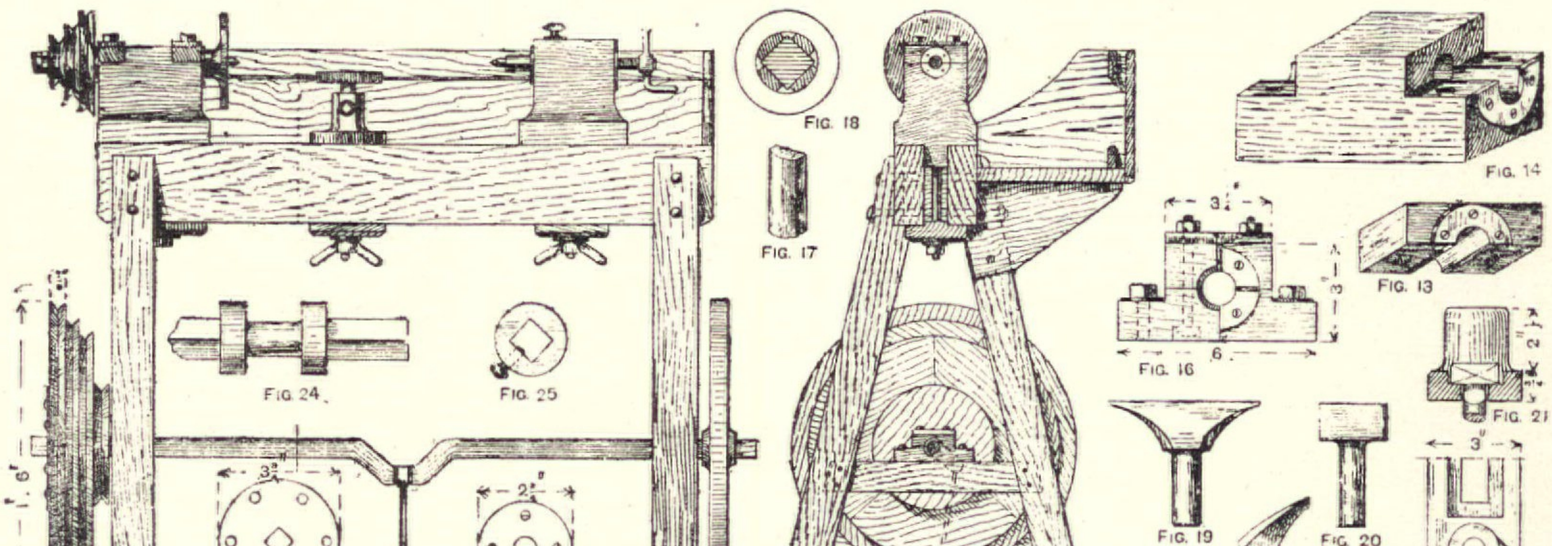
For the bed and standards, sound, well-seasoned oak should be selected. The two pieces for the bed must be planed up square and parallel, 4 feet long, 2 inches wide, by 6 inches deep. The distance pieces are 4¾ inches deep and wide by 1½ inches thick. The two shears of the bed should each be screwed to the distance pieces, the screws being spaced to clear the bolts of the standards. The bed will thus form one solid and independent piece. Next prepare the standards 6½ inches by 2¾ inches by 2 feet 9 inches long. Make a full size template from thin stuff, and mark off the legs from it. The top ends of the standards are haunched to the bed, 1½ inches wide by ¾ inch deep, the lower ends being mortised to the sill piece. The bearers for the crank-shaft are stub-tenoned to the standards, the correct bevel for the shoulders being obtained when the standards are in the sill, and temporarily bolted to the bed. A simpler method would be to house the bearers to the standards, making them 1½ inches wide and 2½ inches deep, and then to secure them with pins. See that the bed bears firmly on the shoulders of both standards, ½-inch bolts being used for fastening. Bore the first hole in each leg with a ½-inch bit; then bore the hole through the bed a little above the true mark, just to give sufficient draw, drive in the top bolts, and screw up on washers. Afterwards, bore the hole for the lower bolt with a long twist-bit, insert the bolt, and screw up. Try the standards on the floor and note whether the sills are in line, any necessary alteration being effected either at the bottom shoulders of the legs or on the under side of the sill. Halve and bolt a 2¼-inch by 2-inch piece to the back of both sills, and to this piece hinge the treadle. A flat-iron tie, 1 inch wide and ¼ inch thick, is screwed to the front ends of the sills. Then make and fix the brackets, back board, and tool rack.

The headstock and poppet (Figs. 4 to 7) should be made from beech. Prepare the blocks to the dimensions given, the tenon fitting the bed being either solid or screwed on afterwards. In Figs. 4 and 5 the thrust collar on the mandrel is shown bearing on a brass washer cut in halves, and screwed to the cap and block, end play being prevented by the lock nuts, which keep the pulley and washer close to the left-hand cap. The mandrel should revolve freely, but without lateral motion when the nuts are locked.

The beech pulley has a square hole through its center, and a plate (Fig. 8) is screwed to each side. The washer between the pulley and the end bearing fits easily on the square part of the mandrel, and revolves with it.

The two mandrels (Figs. 9 and 10) should be turned and the threads must be cut in a screw-cutting lathe, and taper holes bored for the centers. In Fig. 10 a set-screw is shown; this is used to hold the prong chuck (Fig. 11), but in a lathe that is only used for wood turning, the prong (Fig. 12) is screwed in, while the poppet mandrel is coned, as in Fig. 6. For metal turning the movable centers are recommended.

Mark off the block (Fig. 14), cut away the wood each end where the caps (Fig. 13) will fit, and prepare two pieces with the grain running longways. Fix these cap pieces together with the iron caps and the ⅜-inch bolts, and bore the holes carefully at each end for the solid drawn brass tube, which form the mandrel bearings. Next bore the smaller clearing hole right through, also the hole for the holding-down bolt. Cut the brass tube in halves with a fine hack saw and fix the bottom half with a small screw, filing the head flush if it projects above the curve of the brass. Drill oil holes through the caps and brasses, screw on the end brass rubbing washers, rub some red paint thinly on the mandrel, and revolve it in the bearings. The holes, having been bored from the opposite ends, may not be exactly in line, and the red marks will show any discrepancies, and the wood may be pared away to the brass till an even bearing is obtained. It is important that the wooden caps should butt tightly both at the back and on the bottom when screwed home and at the same time the mandrel should revolve without shake. If the mandrel shakes with the caps tightened up, then they must be filed on the bottom and should the caps jam the mandrel before they butt solid on the block, one or more thin liners cut from tin or even brown paper can be inserted. The received the collar end of the crank-shaft. The driving wheel is built up in segments. Arrange the grain to come opposite in each speed, as this will strengthen the wheel and prevent warping. Cut a $1\frac{1}{2}$ inch square hole through the center of the wheel and make eight hardwood folrind wedges. Mount the wheels on the shaft, fix lightly with the wedges, give the shaft a spin round, and mark the side that is out of truth; then, by slacking one pair of wedges and tightening others, the wheel can be made to run fairly true. Give the wedges a final drive up, and have the grooves cut in a lathe, or failing this a temporary wooden rest could be bolted to the standards, and the wheel trued up in its own bearings, which should be carefully adjusted, and it would be an advantage to have the flywheel fixed before the operation; a suitable iron wheel could be obtained second-hand. For fixing a wheel with a large round hole on a square shaft, slightly tapered iron keys are driven tightly home, as shown in Fig. 18. Patterns should be



diameters of the head mandrel are 1 inch and $\frac{7}{8}$ inches. A square is filed on the $\frac{7}{8}$ inch part for the pulley and the lock nuts are threaded $\frac{5}{8}$ inches. The poppet center is $\frac{7}{8}$ inches in diameter with a $\frac{3}{4}$-inch thread. Mark out the poppet block, bore the hole for the front brass bush 1 inch deep, then bore the $\frac{7}{8}$-inch hole through; make a square recess to receive the $\frac{3}{4}$-inch brass or iron nut, and screw on the circular plates (Fig. 15). A sash plate and screw bearing on a small piece of brass or copper clamp the mandrel in position, and hardwood clamping pieces with shallow tongues to slide in the bed with iron washers and wing nuts are used for the rest and poppet. An ordinary square nut will do for headstock, as it is only moved forward when the slow speed is used on the driving pulley.

The bearings (Fig. 16) are of hardwood lined with split brass tube, and with washers screwed to the side of the bearing block which made for casting the hand-rest and tees (Figs. 19 and 23), and a 5-inch or 6-inch face-plate, tapped to fit the thread on the mandrel nose, will be required; it should have six $\frac{1}{4}$-inch holes for attaching a large flat wood face-plate. Finally, the crank-shaft is of $1\frac{1}{8}$-inch square iron, the collars (Fig. 24) being welded on, or fixed with a set-screw, as in Fig. 25. The cylindrical part that fits in the bearings, and also the neck of the crank, could be worked at the forge, and afterwards cleaned up with a second-cut and a smooth file.

The great cathedral in the City of Mexico cost, it is said, \$2,000,000. Its roofs are shingled with brick enough to pave a town of 10,000 people. Brick are the shingles of Mexico. They are fastened down with mortar and there is as much masonry on the top of every church and house as there is in its sides.

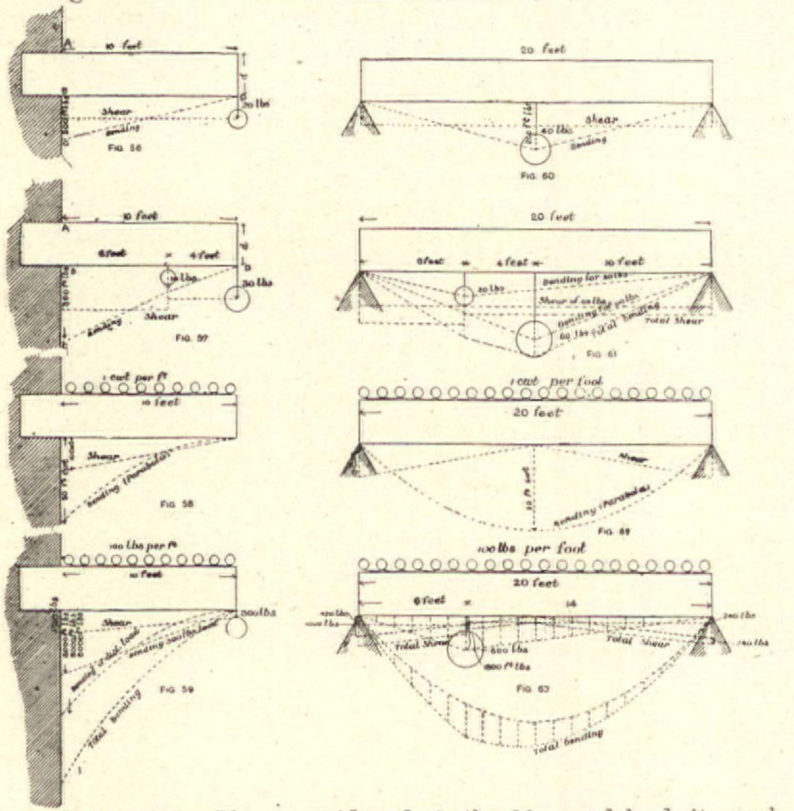
BUILDING CONSTRUCTION—VIII.

Continued from page 29, April Issue.

44. There is some advantage in taking in order of complexity a series of beams and applying to them some of the results of these articles on beams.

Fig. 56 shows a projecting beam fixed in a wall at A. The small weight of 20 pounds is hung at the outer end; the weight of the beam itself is not taken account of. The bending moment at any point is found by multiplying the distance in feet of the point from the end of the beam by the weight 20 pounds, so that it increases regularly. If a point C is taken so that B C equal 200 on any scale, and a straight line C D is drawn, a line drawn from any point at right angles to the beam to meet this inclined line will give the bending moment in feet pounds at that point. The shear is the same at every point and it is equal to 20 pounds. It may help the student to think of any part of the beam measured from the projecting end as a rigid body inequilibrium under two couples—(a) a couple of which one force is 20 pounds and its arm the axis of the portion of the beam considered; its other force is the shear at the point taken, which is 20 pounds, because the two forces of a couple are equal; (b) the other couple is a compound one made up of all the stresses in the fibres above and below the neutral axis.

Fig. 57 shows the same beam loaded at the end and at an in-



termediate point. If we consider, first, the 30-pound load, it can be dealt with as in Fig. 56; find a point at 300 and draw a straight line from this point to the end of the beam. Lines at right angles to the beam will by their intersection with this line give the bending moments at the points from which they are drawn; a further distance of 10 times 6 equals 60 will give a point C, and if this point is joined to where the first line meets the vertical line where the 10 pounds is hung we shall have what we may call a compound line of bending moments. The shear for the first 4 feet, measured from D, is 30 pounds; and for the remainder it is 40 pounds, owing to the added 10 pounds.

Fig. 58 shows the same beam with a uniformly-distributed load. This load may include the weight of the beam. The line of shear shows that the shear increases from the outer end towards the wall; it increases as the weight increases. The bending moment at any point is found by multiplying the sum of the weights between the point and the end by half the distance; if this is done for a number of points, and if lines are drawn at right angles to the beam at these points and made equal to the bending moments on some scale, the ends of these lines will be found to lie on a curve which may be drawn by joining the ends of the lines. This curve is known to be a parabola.

Fig. 59 shows the same beam carrying both a distributed load and a load applied at the end. The curve marked "Total Bending" is found by adding the ordinates of the 300-pound load to those found for the distributed load curve superposing. (The lines drawn at right angles to the beam and terminated at the curve are ordinates. The student should know that ordinates are not necessarily at right angles to an axis.)

These diagrams are not to be taken as examples of real beams. The end said to be fixed in a wall is not to be taken as a workmanlike example of any such fixing. For any practical work the stability of the wall would be an important matter; the beam alone is here considered. The curves and lines show how the bending moment in all cases increases as we proceed from the outer end towards the wall and how in large built beams it will be safe to proportion the different parts to the duty they have to perform.

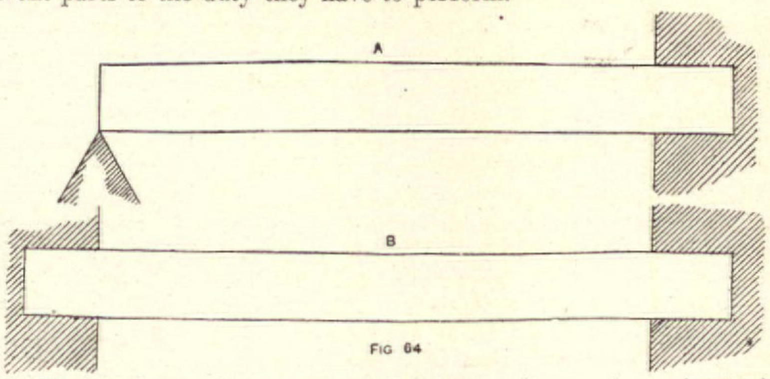


FIG 64

Fig. 60 shows a beam supported at both ends carrying a weight in the center; Fig. 61 shows the same beam carrying two loads. The student will have no difficulty in seeing how the line of total shear and the line of total bending are drawn by superposing the separate lines found for the separate loads. Fig. 62 shows the same beam carrying a distributed load; and Fig. 63 shows a combined distributed load and a weight at a special point.

45. Fig. 64 shows two beams, one supposed to be fixed at one end and resting free at the other end, and the second fixed at both ends. I doubt if such conditions ever occur in practice; if they do occur, they are very rare and special cases. I shall have something to say about continuous beams later.

From Professor Unwin's "Elements of Machine Design" the beam A has for greatest bending moment (close to wall in which it is fixed) when loaded in the middle with a load w, $\frac{3}{16}$ wl (l being the length of the beam). When loaded uniformly the greatest bending moment is at a point $\frac{5}{8}$l from the fixed end, and equals $\frac{wl^2}{8}$. where w is the load per foot run. The beam B when loaded in the middle has a bending moment greatest at the walls, and equals $\frac{wl}{8}$; and when loaded uniformly the greatest bending moment is also at the walls and equals $\frac{wl^2}{12}$.

46. Diagram of bending moments.—A B (Fig 65) represents a beam resting with free ends at A and B; and p, q and r are loads resting upon it. Draw the diagram as shown. A T is the perpendicular of the triangle a P F; the triangle q O K is equiangular with a P F, and o h is its corresponding perpendicular, $\frac{at}{pf}=\frac{oh}{kn}$ ∴ a t . k n= o h . p f, where k n is the force upwards, at a. In the same way, because u t is the perpendicular of the triangle v s f, and this triangle is equiangular with o w k, u t . p=o h . f s. But the moment at t is the difference of these moments; it is, therefore, o h (p f—f s)=o h . p s: o h is a

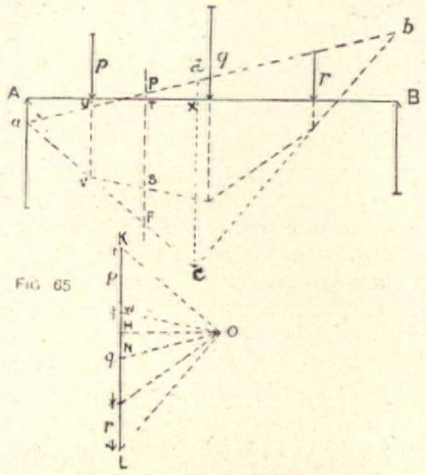


FIG. 65

constant, and therefore the bending moment is proportional to p s. If we have a suitable scale, any such line as p s intercepted between the string polygon and a b will by its length give the bending moment at any point such as t. To find the scale, produce a c and b c to intersect at c, draw c d at right angles to a b, cutting a b at x; now if the loads p q and r were all concentrated at x the line d c would represent the bending moment. This bending moment is the upward force at a×a x=n k . a x; so that if the line d c is divided into equal divisions so as to represent the number standing for n k . a x it will serve for a scale to measure any such line as p s as bending moment at the place.

(To be continued.)

THE USE AND ABUSE OF SCREWS IN WOOD-WORK.

Archimedes is credited with the invention of the screw, but whether the famous geometrician's labors extended much further than the enunciation of the scientific principles and the mechanical power of the screw, it is difficult to say. If he made a screw, he certainly must have tried its effect, and was probably well pleased with its performance, for in the whole range of mechanical appliances in the constructive arts there is not a more useful article than the screw. Archimedes is further reported to have said, "Give me a fulcrum, a position, and a lever strong enough, and I will move the world," and, no doubt, if these conditions could be granted to him, he, as well as others after him, could lift the earth, or aught upon the earth, by combination of the tremendous lifting and driving powers exercised by a series of screws, apart from the lever. Screws are various, and of various sizes, forms, and materials, but the same principle runs through them all, whether they be manufactured for use in metal or wood-work or for expecting a lifting, driving, or pressing power separately. Our object here is not to treat of screw-cutting, but rather screw-driving in wood-work, and to throw out some useful hints to the building constituency, and particularly workmen. The use and abuse of screws is a matter of importance to architects, builders, and their clients, for it is according to the way screws may be applied in several building and kindred operations that good or bad workmanship will be evidenced.

Screws are more extensively used than formerly in putting together various kinds of wood framing, and even in cabinet and chair work screws are pressed into service in places where their use would not have been tolerated by manufacturers in the earlier portion of the present century; much of this is due to the invention of the gimlet pointed screw. Although their existence is generally concealed in furniture and fancy work, they are often present, nevertheless, and too often they are used as a substitute for dowels, dovetails, and tenons in the manufacture of cheap work. It is an instructive and remarkable fact that building workmen of a century or two back, in many operations in carpentry and joinery, discarded, as far as was possible, the use of nails or screws, depending more on carefully jointed work, put together by means of mortise, tenon, dovetail, hardwood dowel, or oaken pin. Their work might have taken a longer time to execute than that done by our present race of joiners and wood-workers, but it was infinitely more lasting, and kept together so long as the timber or wood continued sound. The nearly universal remedy now for every broken article on the part of the jobbing joiner and cabinet-maker is to repair it with the aid of a nail or screw. Glue is even often dispensed with, or used where it will exercise little sustaining power, and colored putty is not only made to cover the heads of sunken nails and screws on the face of a piece of work, but used also to hide bad joints and workmanship. Some years ago the writer examined an old oaken staircase and hand-rail in a college, which work was executed more than two centuries since, and in the construction of which not a nail nor a screw was used. From time to time, over long years, some slight repairs were made, but the workmen during their operations were never able to discover that a nail had been used in the original construction. There were mortises and tenons, grooves and tonguing, wooden pins or dowel work, but no iron fastening of any kind. The writer also examined more than one old roof in which the use of iron spikes, nails, and other iron fastenings was dispensed with, and the joining of the timber was effected without their aid. In the hinging of doors and other framework it is necessary to use screws, but, unfortunately, many workmen, if not watched or cautioned, will not do the screwing properly or in a workmanlike manner. In pine, and other soft woods a brad-awl is sufficient to make an opening for the screw, which opening, of course, should be less than the thickness of the body, and short of the length of the screws used. It will be found, however, that most workmen, not content with tapping the screw a fourth of an inch or so to give it a hold before applying the screw-driver, will actually drive the screw into the wood two-thirds of its length with the hammer. This the workmen will do to save themselves trouble. If there be two hinges upon a door, and if each hinge has eight screw-holes—four in each plate—the chances are that the workmen will drive half of the screws nearly home in the door-stile and frame with his hammer rather than take the trouble of driving them gradually home with the screw-driver. Hence, if the door be a massive or heavy one, the weight of it will tend to the hinges loosening, and after a time will follow a train of other ills—the "dragging" and "rubbing" of doors, and their makeshift cure is what is known as "easing" them. If remonstrated with for driving a screw nearly home with the hammer, the workman may probably say (as some workmen certainly think) that a few turns of the screw in the wood are sufficient. This is an erroneous and mischievous idea. A screw that is nearly driven its whole length with a hammer cannot make a regular and corresponding thread or spiral in the wood, and therefore its binding and maintaining power in keeping the hinge in its place is all but gone. Workmen should be made to drive every screw home gradually with the screw-driver, and not only an odd one. In hardwood operations as well as in soft woods, particularly in hinge work, screws should be properly driven, and the aperture or opening made for the passage of the screws should be much less than the thickness of the screw to be driven. The screw will bite a sufficient passage for itself. In hard wood, however, it is necessary to give a little more freedom of entry to the screw than in soft wood, and a gimlet bit is needed for making the suitable opening instead of the brad-awl.

A difficulty is often experienced by persons who wish to withdraw a screw, by finding that though it will turn round under the application of the screw-driver, yet it will not unscrew out. In this case a well-grounded suspicion may be entertained that the screw in question was driven, or nearly driven, home originally by the hammer, instead of gradually by the screw-driver, and that no regular thread corresponding with the screw exists in the wood. Under such circumstances it becomes necessary often to wrench off the hinge or hinges by force, at the risk of the breaking, and this often happens. When hinges have lain undisturbed for years on old doors or other framings, perhaps for a quarter of a century or double that time, it becomes difficult to extract the screws, although they may have been originally properly driven. This arises from the screws rusting in the wood and sometimes from other causes. Workmen themselves often fail to withdraw a screw, and are forced to break the hinge to enable them to get under the head of the screw, and wrench it out. They often split, and break too, fancy and delicate woodwork articles in their efforts to take off hinges, locks, mountings, and other finishings, despite that simple methods exist for extracting screws that have rusted in the wood. One of the most simple and readiest methods for loosening a rusted screw is to apply heat to the head of the screw. A small bar or rod of iron, flat at the end, if reddened in the fire and applied for a couple or three minutes to the head of the rusted screw will, as soon as it heats the screw, render its withdrawal as easy by the screw-driver as if it was only a recently inserted screw. As there is a kitchen poker in every house, that instrument, if heated at its extremity, and applied for a few minutes to the head of the screw or screws, will do the required work of loosening, and an ordinary screw-driver will do the rest without causing the least damage, trouble, or vexation of spirit. In all work above the common kind, where it is necessary to use screws, and particularly in hinge work and mountings, fancy fastenings and appliances affixed to joinery or furniture work, we would advise the oiling of screws or the dipping their points in grease before driving them. This will render them more easy to drive and also to withdraw, and it will undoubtedly retard for a longer time the action of rusting.

As matters obtain now in carpentry, joinery, furniture, and other wood workmanship, with regard to screws, although they cannot be dispensed with, yet it would be advisable in sundry classes of wood-work to minimize their use, and in other cases to do without them altogether. They can seldom be used with advantage to the displacement of mortise and tenon or good dovetail or dowel work. The growing practice of putting together wood with screws bespeaks a decadence of skilled labor, and of nails and screws there are far too many pressed into service in workshops and dwellings. While admitting the usefulness of the screw in various ways, we have here endeavored briefly to show its abuse in wood-work, and at the same time to afford some hints for better methods of procedure in building and kindred workmanship.

A NEW FURNITURE POLISH.

The Oesterreichische Farben und Lack Zeitung gives the following: White wax, 2,500 parts; water, distilled, 4,500 parts; potassium carbonate, 25 parts; oil of turpentine, 4,000 parts. Boil the wax in 1,500 parts of the water, carrying the potassium carbonate, until the wax is saponified. Add sufficient water to replace that lost by evaporation, and stir till cold and add, little by little, under constant agitation the oil of turpentine, and continue to stir until a complete emulsion is attained. When this occurs add the remainder (3,000 parts) of water all at once and stir in. In case the mixture is incomplete, add a little more oil of turpentine. Perfume with lavender oil. To use the cream, smear a little of it on a thin soft rag, and with this go over the furniture, then polish with a woollen cloth or bit of flannel. The cream answers equally well for leather upholstering, imitation leather, leather cloth, marble, etc.

THE PONTIAC.

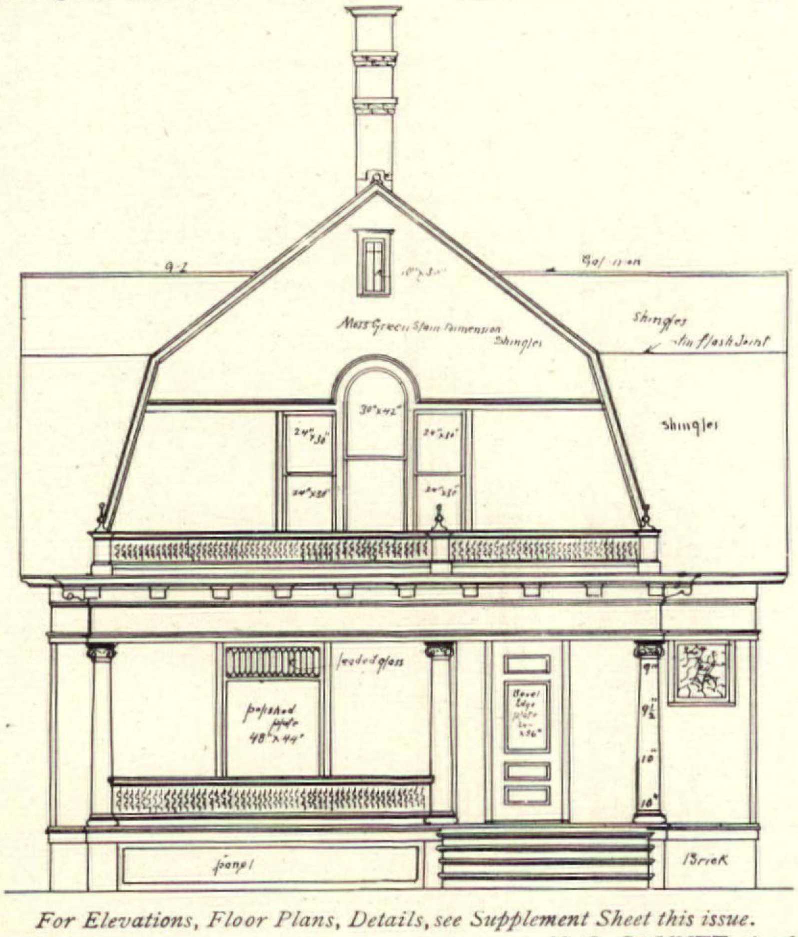
The comfortable six room house shown in this months supplement was designed by Architect N. C. Gauntt, and built in southern Illinois for a family of four adults. The basement is laid with a cement floor, the parlor and dining room are finished in oak, and the other rooms in yellow pine. The estimate, based on Omaha prices, is given below.

ESTIMATE OF PONTIAC.

BY I. P. HICKS.

EXCAVATING AND MASONRY.

228 yards excavating, 30c	$ 68.40
225 square feet brick paving, 8c	18.00
280 square feet cement floor, 12c	33.60
2,600 brick laid in flues, $12	31.20
43 feet 12x12 flue lining, 50c	21.50
43 feet 8x12 flue lining, 40c	17.20
6 stone sills, basement windows, $1.65	9.90
1 stone cap for chimney	4.00
4 cement steps	6.00
1 stone doorsill	2.00
24,500 brick laid in foundation walls, $11	269.50
Total excavating and masonry	$481.30



For Elevations, Floor Plans, Details, see Supplement Sheet this issue.

Pontiac No. 244. **N. C. GAUNTT, Architect.**

LUMBER BILL.

	Feet.
4 pieces 2x6x14 ft. sill plates	84
8 pieces 2x6x16 ft. sill plates	128
6 pieces 2x8x14 ft. sill plates	114
10 pieces 2x8x16 ft. sill plates	210
20 pieces 2x10x16 ft. floor joist	540
22 pieces 2x10x14 ft. floor joist	506
10 pieces 2x10x18 ft. floor joist	300
8 pieces 2x10x12 ft. floor joist	160
28 pieces 2x10x16 ft. second floor joist	756
10 pieces 2x10x18 ft. second floor joist	300
8 pieces 2x10x14 ft. second floor joist	184
8 pieces 2x10x12 ft. second floor joist	160
16 pieces 2x10x12 ft. porch ceilings	320
2 pieces 2x10x18 ft. porch ceilings	60
75 pieces 2x4x18 ft. outside studs	900
58 pieces 2x4x16 ft. gable studs	638
62 pieces 2x5x10 ft. partition studs	403
58 pieces 2x4x18 ft. partition studs	696
44 pieces 2x4x16 ft. plates	484
36 pieces 2x4x18 ft. rafters	432
56 pieces 2x4x12 ft. rafters	448
14 pieces 2x4x10 ft. rafters	91
22 pieces 2x6x20 ft. collar beams	440
22 pieces 2x6x12 ft. collar beams	264
Total ft. framing lumber	8,618

8,618 feet framing lumber, $20	$172.36
2,700 ft. No. 1 sheathing for outside walls 1x8, 10 and 12 in.x12 and 16 ft. length, $22	59.40
2,000 ft. No. 1 sheathing, rough floors, 1x8, 10 and 12 in.x12 and 16 ft. length, $22	44.00
2,100 ft. No. 2 sheathing for roofs, 1x8, 10 and 12 in.x12, 14 and 16 ft, length, $20	42.00
16 M clear red cedar shinges, roof, $3.25	52.00
4 M dimension shingles, $4	16.00
2,000 ft. 1x4 in., 12 and 16 ft. Y. P. flooring No. 2, $26	52.00
60 ft. 1x4 in., 12 ft. No. 1 white pine flooring, $50	3.00
340 ft. 1¼x4 in., 16 ft. No. 1 white pine flooring, $55	18.70
1,900 ft. ½x4 in.x12, 14 and 16 ft. beveled siding No. 1, $33	62.70
8 rolls red rosin building paper, $1	8.00
400 ft. ⅝x4 in.x16 ft. No. 1 ceiling, for porches, $27	10.80
300 ft. ⅝x4 in.x16 ft. No. 1 ceiling, for wainscoting, $27	8.10
1,200 ft. C. select finish for cornice, etc., 300 ft. 1x8, 12 and 16; 600 ft. 1x10, 12 and 16 ft; 300 ft. 1x12, 16 ft., $50	60.00
100 ft. 1¼x12 in.x16 ft. C select finish, $55	5.50
Total lumber bill	$614.56

MILL WORK.

6 plank cellar window frames, $1.40	8.40
4 plank cellar door frames, $2.25	9.00
2 outside door frames, $2.25	4.50
9 window frames, $1.85	16.75
1 triple frame	7.00
6 small frames, $1.75	10.50
2 attic or gable frames, $1.25	2.50
1 large frame	3.00
6 set oak door jambs, $1	6.00
6 set Y. P. door jambs, 60c	3.60
4 cellar sash, 1 lt. 30x18, $1.10	4.40
2 cellar sash, 1 lt. 32x18, $1.20	2.40
3 cellar doors, 2 ft. 8 in. by 6 ft. 8 in, 1⅜ in., $2.30	6.90
1 cellar door, 2 ft. 10 in. by 6 ft. 8 in., 1⅜ in., $2.40	2.40
1 front door, 3 ft. by 7 ft. 6 in., oak and plate	15.00
2 sliding doors, 3 ft. by 7 ft. 6 in., 1¾ in., oak veneered	24.00
1 door 2 ft. 8 in. by 6 ft. 8 in., 1⅜ in., oak veneered	9.00
2 doors 2 ft. 8 in. by 7 ft. 6 in., 1¾ in., veneered oak one side Y. P. one side	20.00
1 door 2 ft. 8 in. by 7 ft. 6 in., 1¾ in. Y. P. veneered and plate	13.50
1 screen door, 2 ft. 8 in. by 7 ft. 6 in. 1⅜ in.	3.50
Screens for porch	7.00
3 doors 2 ft. 8 in. by 7 ft., 1¾ in. pine, $5.50	16.50
3 doors 2 ft. 6 in. by 7 ft., 1⅜ in., $3.50	10.50
1 door 2 ft. by 6 ft., 1⅜ in.	3.00
1 window 48x44, plate and leaded	21.00
4 windows, 2-lt. 36x30, D. S., $3.60	14.40
3 windows, 2-lt. 32x30, D. S., $3.25	9.75
2 windows, 2-lt. 30x24, S. S., $1.80	3.60
1 window, 36x24, art, one sash	5.00
1 window, 36x24, plain, one sash	1.00
1 window, 24x24, art, one sash	3.60
2 windows, 2-lt. 24x30, D. S., $2.50	5.00
1 window, 2-lt. 30x42, D. S., circle top	6.00
2 windows, 36x30, one sash divided, $6	12.00
2 windows, 20x30, one sash divided, $3	6.00
2 windows, 10x30, one sash divided, $2	4.00
160 lineal ft. 3 member oak base, 8c	12.80
180 lineal ft. 3 member Y. P. base, 5c	9.00
50 lineal ft. 7½ in. plain base, closets, 3c	1.50
272 lineal ft. 4 in. oak casing, 4c	10.88
76 lineal ft. 3 member cap trim, oak, 10c	7.60
2 oak pedestals	8.00
60 lineal ft. 2 in. oak door stops, 1½c	90
120 lineal ft. 1 in. oak window stops, 1c	1.20
36 lineal ft. 3½ oak window stool, 3c	1.08
10 oak plinth blocks, 15c	1.50
414 lineal feet 4 in. Y. P. casing, 3c	12.42
56 lineal ft. plain casing, closets, 2c	1.12
100 lineal ft. 3 member cap trim, Y. P., 6c	6.00
60 lineal ft. 3½ in. window stool, Y. P., 2c	1.20
28 plinth blocks, 10c	2.80
150 ft. 2 in. Y. P. door stops, 1c	1.50
170 ft. 1 in. Y. P. window stops, ½c	85
4 front porch columns, $6	24.00
3 rear porch columns, $1.50	4.50
33 lineal ft. porch rail bottom, 7c	2.31
33 lineal ft. porch rail top, 7c	2.31
100 balusters, 12c	12.00
5 porch newels, top of porch, $2.25	11.25
32 lineal ft. bottom deck rail, 7c	2.24
32 lineal ft. top deck rail, 7c	2.24
96 balusters, 9c	8.64
20 brackets, 40c	8.00
Seats	7.00
Flour bin and cupboard	20.00
320 ft. 4½ in. crown mold, 2c	6.40
180 ft. 2 in. band mold, 1c	1.80
320 ft. ⅞ in. cove mold, 1c	3.20
300 ft. ⅞ in. quarter round, ¾c	2.25
200 ft. ½x¾ in. stop mold, ½c	1.00
88 ft. 3½ in. wainscoting cap mold, 2c	1.76
30 ft. 5 in. oak threshold, 4c	1.20
2 oak corner beads, 40c	.80
2 Y. P. corner beads, 25c	.50
Front stairs	65.00
Total mill work	$569.45

CARPENTER WORK.

15,418 ft. rough lumber, labor for working up, $10	$154.18
20 M. shingles, $1.50	30.00
6,700 ft. flooring, siding, finish, etc., at $15.	100.50
35 per cent of mill work, $569.45 for fining same	199.30
Total carpenter labor	$483.98

RECAPITULATION.

Excavating and masonry	$ 481.30
Lumber bill	614.56
Mill work	569.45
Carpenter work	483.98
Hardware	48.00
Tin work	52.00
Painting	198.00
Plastering, 672 yds. 30c	201.60
Plumbing	280.00
Gas fitting	20.00
Total	$2,948.89
For incidentals add 5 per cent	147.44
Total estimate	$3,096.33

Carpenter wages in Omaha are 40c per hour, but I presume 35c will come nearer suiting most localities. I aim to get estimate high enough for it is better to figure too high than too low.

Legal Decisions.

A building erected by a town for a free public library is not subject to a mechanic's lien. Young vs. Inhabitants of Falmouth, 66 N. E. Rep. (Mass.) 419.

New York Lien Law requiring the notice of lien to contain the name and residence of the lienors, is not satisfied by giving their firm name and place of business. Kane et al. vs. Hutkoff et al., 81 N. Y. Supp. 85.

An amphitheater and framework built on posts firmly imbedded in the soil constitutes an "appurtenance" within the meaning of the statute and is subject to a mechanic's lien. H. F. Cady Lumber Company vs. Greater America Exposition Company et al., 93 N. W. Rep. (Neb.) 961.

In an action to enforce a building contract, which defendant claimed had never been performed as specified, evidence that defendant rented the building as erected, and permitted the tenant to go into possession, and as to what the tenant did, was inadmissible. Mitchell vs. Williams, 80 N. Y. Supp. 864.

The right to a mechanic's lien is not lost by the mere execution and delivery by the claimant of an order requesting the debtor to pay the amount of the claim to a third party, where it is not shown that the latter has accepted it or acted thereon. Omaha Oil & Paint Company vs. Greater America Exposition Company, et al., 93 N. W. Rep. (Neb.) 963.

A mechanic's lien attaches to a leasehold interest and to buildings erected by one tenant and sold to another, who has acquired a lease of the same interest, and this notwithstanding the removal of the buildings at the end of the term is expressly required by the lease. Zabriskie vs. Greater America Exposition Company, et al., 93 N. W. Rep. (Neb.) 958.

Where a servant is ordered to work on a platform built by another, it is the duty of the master, as between himself and the servant, to see that such platform is securely and safely supported for the work required to be done. John S. Metcalf Company vs. Nystedt, 102 Ill. App. 71.

Under Comp. Laws, section 10734, relative to mechanics' liens, which provides "that all liens or claims for liens which may arise or accrue under the terms of this act shall be assignable," it is not necessary that the laborer or materialman first file a statement of his claim to make it assignable. McAlister vs. Des Rochers, et al., 93 N. W. Rep. (Mich.) 887.

Where an employe, engaged in painting the outside of a tall building, is directed by his employer to take a certain scaffold and proceed with his work, he has the right to assume that the scaffold is reasonably safe for him to use in such work. Ehlen vs. O'Donnell, 102 Ill. App. 141.

Whether a mechanic's lien attaches under a building contract depends at the outset on the nature of the contract, and not on that which is done under it. A contractor must show that his contract brings him within the terms of the law, or he cannot have a lien. Vanderpoel vs. Knight, 102 Ill. App. 596.

A furnisher of materials with priivlege on a building may look to the amount due to the contractor, his debtor, under the building contract, and is not bound to have recourse to the surety on the contractor's bond; and it makes no difference that the contractor has assigned his right to payment under the contract. Simpson, et al. vs. City of New Orleans, et al., 33 So. Rep. (La.) 912.

The construction of the brick work of a house abutting on a street is not an enterprise inherently dangerous to the public passing along the street, so as to make the owner of the house liable for injuries caused to a pedestrian by an obstruction placed in the street by an independent contractor doing the brick work. City of Richmond vs. Sitterding, 43 S. E. Rep. (Va.) 562.

Where a carpenter engaged in building a house on his own lot contracted with a firm of brick masons to do all the brick work, such firm employing the necessary labor, the brick masons were independent contractors, and the builder was not liable for injuries resulting from an obstruction placed in the street by them. City of Richmond vs. Sitterding, 43 S. E. Rep. (Va.) 562.

Where a building contract authorized the owner to take possession of the work and complete the same on the contractor's default, such provision was a privilege of the owner, and not a duty which he owed to the contractor, and his failure to exercise the same did not constitute a waiver of the contractor's default. Mitchell vs. Williams, 80 N. Y. Supp. 864.

Where a building contract provided that the work should be done to the owner's satisfaction in a perfect workmanlike manner, and should be accepted by him, and after the work was finished the owner refused to accept it and pointed out defects to the contractor, which he made no attempt to remedy, the fact that the work was done under defendant's supervision during its progress was immaterial. Mitchell vs. Williams, 80 N. Y. Supp. 864.

Where plaintiff, who was on the bond of a building contractor, agreed with the latter and the owner to complete the work and to receive the compensation, thereby being released from liability for the contractor's delay, he became the assignee of the original contractor, and his right to the amount due on the completion of the work was subject to liens that had been perfected against the original contractor. Smith vs. Schile, et al., 80 N. Y. Supp. 1078.

Where, in a suit to enforce a mechanic's lien, it appears that some of the articles were furnished more than ninety days before the filing of the lien, the lien should nevertheless be sustaind as to the articles furnished within the ninety days, in the absence of any fraud or bad faith on the part of the plaintiff, and where it appears that he believed himself entitled to a lien for all the items. Wolfley vs. Hughes, 71 Pac. Rep. (Ariz.) 951.

One who furnishes under a running account with the common owner of a group of exposition buildings materials for use in the illuminating equipment thereof is entitled to a lien on such buildings, where they are maintained for a common purpose, though they are not all situated on contiguous lots, and though the claimant is not able to show what portions were used in a particular building. Lehmer vs. Horton et al., 93 N. W. Rep. (Neb.) 964.

Under the mechanic's lien law of 1895, providing that no lien shall be created under it, if the time stipulated for payment is beyond one year from the time provided for the completion of the work, no lien arises from a contract stipulating for payment by notes, some of which run for years beyond the time stipulated for the completion of the work. Vanderpoel vs. Knight, 102 Ill. App. 596.

Vendors who permit a purchaser, who has failed to comply with the terms of his purchase, to continue the expenditure of money in making improvements after the expiration of the time for payment, cannot by notice terminate his interest in the property so as to cut off the lien of a carpenter by the purchaser to erect buildings on the land, but the latter may enforce his claim subject to the right of the vendors to recover the purchase money. Hoffstrom vs. Stanley, 14 Man. R. (Can.) 227.

Patents.

The following list of recent patents and trademarks relating to building interests is especially reported for THE NATIONAL BUILDER by Wm. G. Henderson, solicitor of American and foreign patents and trademarks, Norris Bldg., 501 F Street, Washington, D. C. A copy of any of the U. S. Patents will be furnished by him for 25c.

724,152. Door-spring. Joseph H. Anderson, St. Louis, Mo.

723,808. Door closer and check. Joseph Bardsley, Montclair, N. J.

723,922. Door-hanger. Marcius C. Richards, Aurora, Ill.

724,052. Rotary fly-bush attachment for screen-doors. Samuel G. Scholz, Billings, Mo.

724,790. Stair structure. Nathaniel Bois, assignor to himself, M. and A. Goldberg, New York, N. Y.

724,804. Rotating storm-door. John L. Carter, Brooklyn, assignor to Carter Rotary Door Company, New York, N. Y.

724,683. Window casing and screen. Franklin C. Eastman, Cambridge, and A. G. Eastman, Brookline, Mass.

725,000. Window. Peter O. Hultmark, assignor to J. T. Leonard, New York, N. Y.

724,878. Sash-pulley or similar device. Allen Johnston, Ottumwa, Iowa.

724,897. Joint for carpentry. George B. Lee, New London, Conn.

724,495. Column construction. Alexander G. Perkins, Newburyport, Mass.

724,521. Door-check. William M. Teeter, Cripplecreek, Colo.

725,038. Device for building cement or concrete structures with hollow walls, flues, etc. William H. Caldwell, Wayne, Mich.

725,042. Window-blind. Ellsworth A. Clark, assignor of one-half to T. L. Keller, Boulder, Colo.

725,552. Doorway. Amos F. Gerald, Fairfield, Me.

725,575. Fireproof door or shutter. John C. Mallory, deceased, Franklin, Pa.; M. B. Mallory, executrix.

725,577. Sash-lock. John D. Miller, San Antonio, Tex.

725,135. Sliding-door track and hanger. Theodore C. Prouty, Midland, Mich.

725,136. Track for rolling doors. Theodore C. Prouty, Albion, Mich.

725,364. Flooring or paving tile. Charles H. Puls, Hoboken, N. J.

725,291. Roof. Timothy B. Stewart, Hartford, Conn.

726,190. Door-hanger. Alexander E. Randle, Grayville, Ill.

726,210. Screen for windows, doors, or the like. Frank C. Wright, Cavespring, Ga.

BUILDING MATERIAL PRICE LIST

REVISED TO DATE.

NO. 1 YELLOW PINE DIMENSION.	Omaha Prices furnished by I. P. Hicks:	Chicago Prices furnished by J. A Fraher:
2x 4—12—14 & 16 ft	$19.00	$19.00
2x 6—12—14 & 16 ft	19.00	19.00
2x 8—12—14 & 16 ft	19.00	19.00
2x10—12—14 & 16 ft	20.00	20.00
2x12—12—14 & 16 ft	20.00	22.50
4x4 to 8x8—12—14 & 16 ft	22.00	21.00
For 18 & 20 ft. lengths add	1.00	1.00
For No. 1 White Pine Dimension add per M $3 more than Yellow Pine. Hemlock $2.00 less.		
BOARDS.		
No. 1, Y. P. Sheathing	$22.00	$22.50
No. 2, Y. P. Sheathing	19.00	19.00
No. 1, W. P. Sheathing	23.00	27.50
No. 2, W. P. Sheathing	20.00	23.00
FENCING.		
No. 1, Y. P. Fencing	$20.00	$22.50
No. 2, Y. P. Fencing	19.00	19.00
No. 1, W. P. Fencing	28.00	27.50
No. 2, W. P. Fencing	25.00	23.00
SHIPLAP.		
No. 1, Yellow Pine Shiplap	$22.00	$22.50
No. 2, Yellow Pine Shiplap	19.00	19.00
No. 1, White Pine Shiplap	28.00	28 00
No. 2, White Pine Shiplap	25.00	23.00
FLOORING.		
No. 1, or Clear, Y. P. Flooring	$27.00	$24.50
No. 2, or Star, Y. P. Flooring	26.00	23.00
No. 3, or Common Y. P. Flooring	23.00	19.00
No. 1, White Pine Flooring	50.00	28.00
No. 2, White Pine Flooring	40.00	23.00
No. 3, White Pine Flooring	30.00	18.50
CEILING AND PARTITION.		
No. 1, or Clear, Y. P. ⅝ Ceiling	$27.00	$25.00
No. 2, or Star, Y. P. ⅝ Ceiling	25.00	22.00
No. 1, or Clear, Y. P. Partition	30.00	28.50
No. 2, or Star, Y. P. Partition	28.00	24.50
DROP SIDING.		
No. 1, or Clear, Y. P. Drop Siding	$28.00	$28.00
No. 2, or Star, Y. P. Drop Siding	27.00	25.00
BEVELED SIDING—5-inch.		
No. 1, White Pine Siding, B	$33.00	$32.00
No. 2, White Pine Siding, C	31.00	30.00
No. 3, White Pine Siding, D	25.00	25.00
Clear Red Cedar Siding	30.00	28.00
FINISH.		
Clear Yellow Pine Finish, ⅞	$35.00	$32.50
No. 1, White Pine Finish, ⅞	60.00	49.50
No. 2, White Pine Finish, ⅞	55.00	38.50
No. 3, White Pine Finish, ⅞	50.00	——
SHINGLES.		
Clear Red Cedar Shingles	$ 3.25	$ 3.50
W. P. Shingles, Best Star A Star	3.50	3.75
W. P. Shingles, Second Quality	2.75	3.00
LATH.		
No. 1, White Pine	$ 5.00	$ 4.50
PICKETS.		
Clear Pickets, 4 ft., per 100	$ 2.80	$ 2.40
BUILDING PAPER.		Per 100
Straw Paper, per lb	$ .01¾	$ 1.05
Tar Paper, per lb	.02	1.30
Tarred Felt, per lb	.02½	1.75
Red Rosin, Atlas Brand, 500 ft., per roll	1.00	.65
Red Rosin, Durable Brand, 500 ft., per roll	1.00	.50
SUNDRIES.		
Lime, per barrel	$ 1.00	$ .60
Cement, per barrel	1.50	1.60
Cement, Imp. Portland, per barrel	3.50	2.55
Hair, per bushel	.25	.20

Trade Review.

(Readers writing for any catalogue, circular or leaflet mentioned in this department will confer a favor by making mention of THE NATIONAL BUILDER.)

NEW ARTIFICIAL STONE.

The American Hydraulic Stone Company, 214 Century building, Denver, Colo., are sending out to architects, reading matter on their cement building blocks, which they claim make one of the cheapest walls obtainable, at the same time possessing great strength.

A page cut of the Angelus hotel building, El Paso, Tex., which is built entirely of American hydraulic stone, is shown in the catalogue, the walls in this building above the first floor being nine inches in thickness. Both the material and construction were in the hands of inexperienced Mexican laborers and no attempt was made to face the blocks. The building, however, presents a very handsome appearance.

The company is looking for agents to handle the exclusive manufacturing rights in every county and town in the country, and further information will be sent if desired.

Their advertisement which appears on another page of this issue will interest those who could use material of this kind.

CARPENTER'S APRONS.

In the advertisement of the S. G. Roloson Manufacturing Company, Lima, O., which appears on another page of this issue, carpenters will find something of vital interest to them.

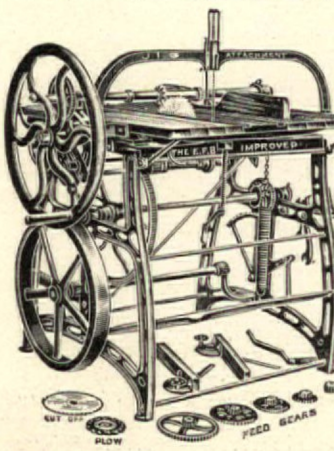
This concern is probably the only one in the United States which makes a specialty of carpenters' aprons. They have a large manufacturing plant, capable of turning out thousands of these aprons every day, and doing the work at a minimum expense, hence giving the carpenter the benefit of the low price and the best material and workmanship.

It is strange that an article of this kind has not been put on the market until recently. Almost any carpenter who uses a nail apron would be willing to give 25 cents to have one delivered to him ready for use.

These aprons are made from the best 10-ounce ducking, sewed with heavy thread, and will last a long time. At the price no better goods than these can be procured.

IMPROVED SAWING MACHINE.

The Barnes Tool Co., New Haven, Conn., advertisers in this journal, show in the accom-



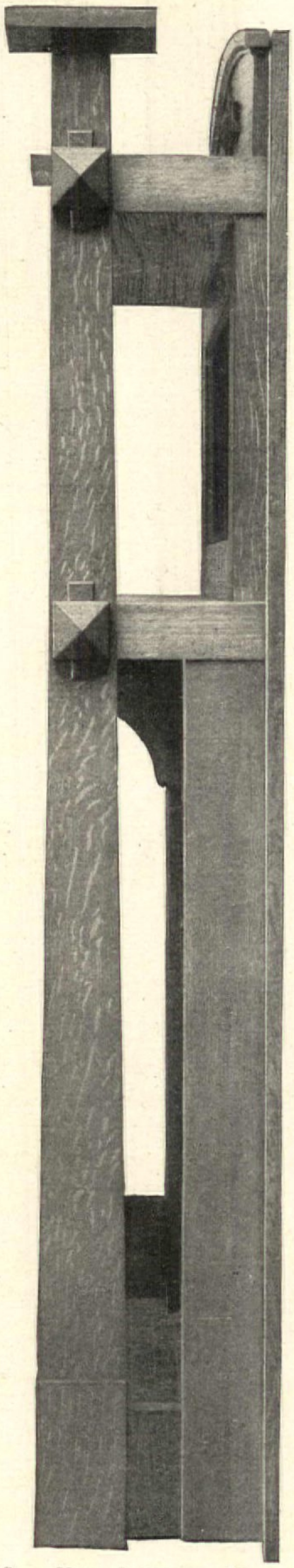
panying cut their E. F. B. Improved Sawing machine made by them.

During 1892, when the World's Fair was being built at Chicago, the Barnes Tool Co. sold a great number of these machines to the builders and contractors on Fair work. This sawing machine is peculiarly adapted to meet the needs of the larger class of builders who have shops without power, and it is not too heavy to be taken out to a building in course of construction, where it will be found useful nearly every hour of the day.

Special inducements are now being offered to cash buyers of this machine, and the Barnes Tool Co. invite inquiry from all who are looking for a practical machine of this kind.

NEW MANTEL AND GRILLE BOOK.

Charles F. Lorenzen & Co., 272 North Ashland avenue, Chicago, have an 88-page catalogue on the press, which they say will be the finest piece of literature in this line ever gotten out. The leaves will be about the size of THE BUILDER'S and it will be about twice the thickness.



SIDE VIEW LORENZEN MANTEL.

Many mantel firms have attractive catalogues nowadays, but we do not remember of any of them ever showing a side view or section of a mantel. This point Lorenzen & Co. have taken up, and the side details with front view at once gives the intending buyer an exact idea of the mantel.

Another point about this firm's mantels is that every one is fitted with the improved Columbian ventilating grate without extra charge to the buyer. These grates are made in one piece like a stove and require no labor or expense to set, it being only necessary to push them into the fireplace and they are ready for use. They are for hard or soft coal, coke or wood. Lorenzen & Co. state that these grates are more cleanly, more economical and better in every way than any other grate now on the market.

Grilles will also be another feature of this catalogue and no expense has been spared in getting up the finest designs obtainable and prices which will surprise every builder on account of the low figure.

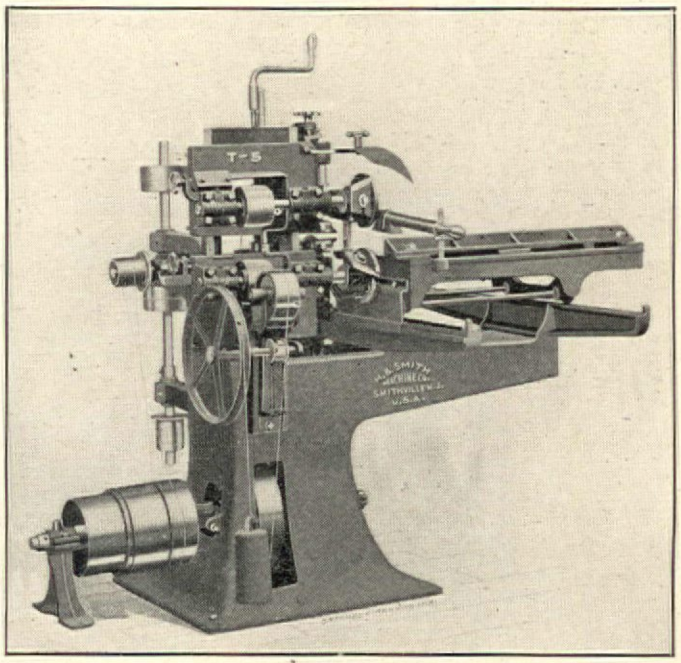
The catalogue will be off the press by the 16th of the month and will be sent free to any of our readers. Special inducements are made by Lorenzen & Co. to secure an agent in every town for their mantels and grilles.

A NEW TENONING MACHINE.

This new tenoner is the result of an experience of over forty years in tenoner construction and is intended for the lighter class of work.

It will be fitted with single heads that will cut tenons as long as 3¼ inches or, by passing the material through twice, six inches long; and can be fitted with double or single copes as may be desired. And it may be fitted with a cut-off saw in the rear as required in sash, door and blind work, or with a cut-off saw in front, as may be preferred in cabinet and furniture work.

The framing is of pedestal form with base wide enough to properly support all projecting parts, and the ways are bolted firmly to the top framing and always remain true and parallel.



SMITH TENONER.

The table or carriage is of deep section and cannot bend or spring, is provided with a shield for protecting the ways from shavings, and which at the same time prevents the carriage from lifting out of place.

The carriage is mounted on the ways differently from all others in the fact that the rolls, which are in the table, are connected from end to end and must turn at both ends, hence the table must move true across the ways. This arrangement not only insures an easy movement, but great accuracy and durability.

The head-stocks are adjustably gibbed to the upright framing, and are adjustable up and down for regulating the position and thickness of tenon by two screws without the intervention of gearing, hence the adjustment is accurate and without any possible variation. The upper stock has longitudinal movement for regulating the position of shoulder on tenon, and will adjust 4¼ inches above the table.

The cutter heads are fitted with spurs for cutting the shoulders.

The new belt compensating device for the cutter spindles, without the usual rack, is an improvement that will be appreciated.

Further particulars upon application to the manufacturers, H. B. Smith Machine Company, of Smithville, N. J.

A NEW MATERIAL FOR BUILDING.

On account of the manifold advantages which cement has over all other similar substances, it has found its entrance into nearly all the important cities and states where industry is found, and is becoming more and more popular as time goes on.

Among the present building materials which resist the influences of temperature and fireproof, the new building stones manufactured and constructed by Architect H. Maring of Darien, Conn., deserve particular mention.

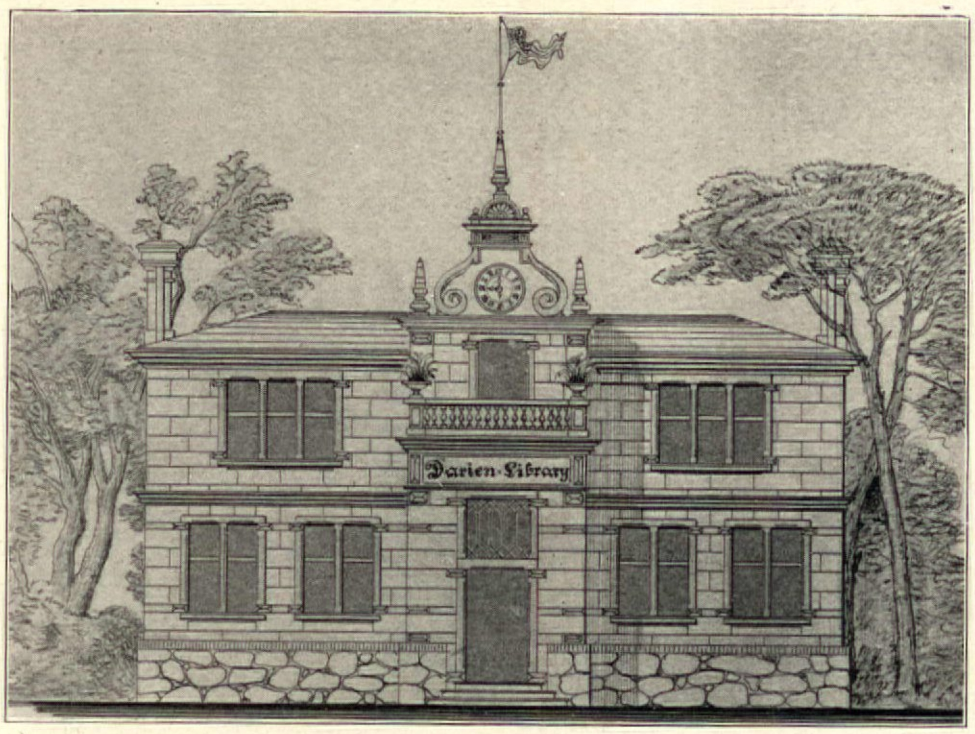
Fig. 1 illustrates a library, which will be completed within a short time at Darien of this new material. The first story consists of the library and one store; in the second story there is a concert hall, which may also be used as a gymnasium and meeting room.

These building stones may be used for certain parts of walls and ceilings, as well as for entire buildings.

On account of its practically arranged insulation, the original weight is greatly diminished, and, at the same time, there is obtained a considerable increase in safety, thus making, as a rule, small dimensions sufficient. It is claimed that the use of these blocks saves space, material and money. They are also fireproof and possess many other hygienic advantages which have been recognized by medical authorities. This construction is especially adapted to this country and it is, without doubt, the cheapest and most advantageous material.

It is the custom in this country to use wood for building purposes, and chiefly thin boards. In dwellings of this kind it is uncomfortable both in summer and in the winter; in the summer it being too warm and in the winter too cold. By using the new construction, which has been patented in the United States, the opposite effect is obtained, i. e., the dwellings are cool in summer and comfortable and warm in the winter, as the material shows the greatest compactness, and by means of practical insulation keeps distant the outer temperature from the inner.

This construction may be used on walls and ceilings in factories, country houses and city dwellings and at a very low price. Catalogues will be mailed if desired.



DARIEN LIBRARY. BUILT FROM MARING'S NEW MATERIAL.

ACETYLENE GAS GENERATORS.

In the front part of THE NATIONAL BUILDER will be found two illustrations of the Sunlight Gas Machine Company's machines, which are now being used in so many residences, business blocks, etc., where perfect light is desired.

A perfect artificial light should have the highest illuminating capacity and as nearly as possible resemble sunlight, as to its rays, its effect on colors, eyesight and health. Acetylene does not tire the eye. It neither smells, smokes nor makes dirt of any kind and its use cannot in any way prejudice health. The cost of acetylene lighting compared to gas and electricity is very much lower.

As late as four years ago there were as many as some 285 generators, the use of which was permitted by the National Board of Fire Underwriters—today there are only about sixty-two. While the accidents from acetylene have been small in number as compared with those resulting from coal and oil and from electricity used in lighting, it has shared the fate of all innovations—not being properly understood, it was too often improperly handled, which caused it to be distrusted. The "fire board" of the National Board of Insurance Underwriters, having made an exhaustive study, now have it well in hand and unhesitatingly permit its use under certain well defined conditions.

The Sunlight Gas Machine Company have, in their "Omega" and "Submarine" engines, two of the finest generators for acetylene gas lighting on the market. These two generators will supply gas for any home or business house at about the cost of kerosene oil. They are said to be so simple to operate that there is absolutely no danger in their use and there is no labor attached in the way of keeping clean, etc.

This company will be glad to mail catalogues etc., on acetylene lighting.

Mr. F. Reissmann, West Point, N. Y., whose rafter and polygon gauge is used by so many readers of THE NATIONAL BUILDER, has issued a new catalogue of improved and up-to-date carpenters' novelties.

With Mr. Reissmann's rafter and polygon gauge it is possible to obtain instantly and accurately any one of the 393 cuts used in the construction of buildings and roofs. This instrument or tool is rectangular in shape and made of heavy three-ply veneer, size being ¼x10 x13 inches.

One of his latest and most useful novelties in a sandpaper holder for carpenters, cabinet makers, and, in fact, all mechanics who use sandpaper, emery paper or emery cloth. By using one of these holders, the sandpaper will always be held securely in place by means of wire clamps. The heavy felt, with which the holder is covered and over which the sandpaper is placed, will prevent the surface of the articles from being scratched. It saves sandpaper and labor and costs very little.

Mr. Reissmann's advertisement appears in this issue.

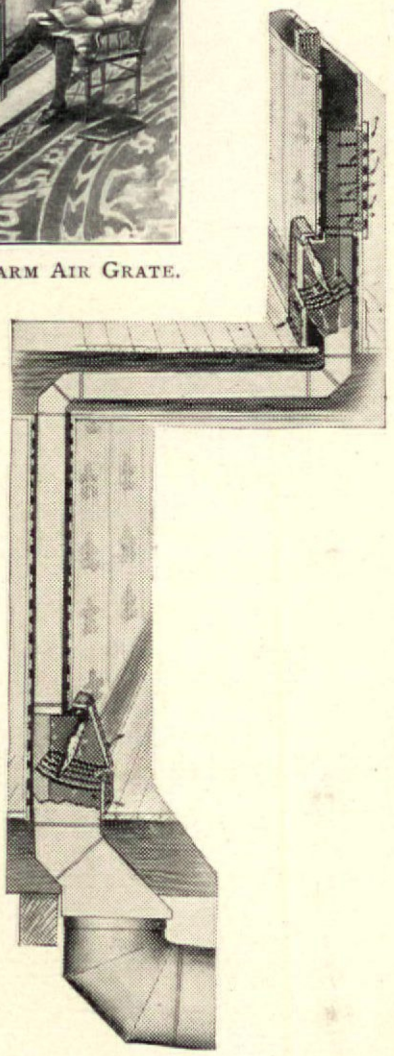
A NEW SIDE WALL REGISTER.

The question of house warming is of greater or less interest to those who are building In nearly every house of moderate cost a warm air system is being used and it is becoming a problem to arrange pipes, registers, etc, so as to obtain the best possible results

The Auer Register Co., of Toledo, Ohio, have recently placed on the market a side wall register, which has all the good points of a floor register and without any of the drawbacks common to the old flat register placed in the floor around which carpets have to be cut and which is constantly being filled with dirt and dust.

The Auer Register Co. have also arranged to

AUER WARM AIR GRATE.



use two or more registers attached to one pipe, therefore, saving the cost of extra piping and at the same time giving the best results.

In the accompanying illustrations, Fig. 1 shows a register as it appears in the room; Fig. 2 shows a sectional drawing of two registers attached to one pipe.

The question of registers often perplexes builders and furnace men alike. The housekeeper dreads to sacrifice her floors and carpets by cutting holes for registers and thus place a receptacle for dust and sweepings and the furnace man dreads the results of insufficient capacity when they are placed in the wall.

The Auer Register has an enormous capacity and throws the heat well out into the room. It also affords the comfort of a floor register as a foot warmer. In placing these registers on the market the inventor now offers to the public a tried and improved device, which does away with the unsightly and unsanitary floor grating, obviates the cutting of carpets, allows for the use of large pipes, heating upper and lower rooms at the same time; draws off the foul air from the floor; and which is a foot warmer and deflector, presenting, when not in use, a tightly closed ornamental front.

This system of heating is well worthy of attention from those contemplating placing furnace heat in buildings of any description. The cost is moderate and the manufacturers will be pleased to give further information.

A NEW OVERHEAD WINDOW PULLEY.

Tne accompanying illustration shows a new overhead pulley now being put on the market by the Grant Pulley and Hardware Company, of 25 Warren street, New York.

The pulley is made with three styles of bearings—i. e., ball bearings, roller bearings and the plain pinion—which are sold at different prices, according to the requirements of the customers. The housing is made in one piece of iron, which will resist any possible load without fracture. The housing connects the soffit, so that mortar will not clog the wheels. The sash chain or cord is easily inserted with a mouse, which is furnished with each order.

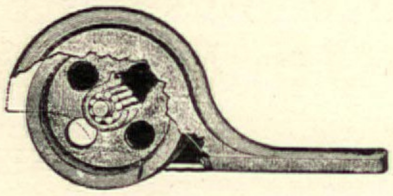


FIG. 1.

The manufacturers claim that with this pulley, even for the heaviest plate glass windows, iron weights may be used instead of lead, thus greatly reducing cost. The pulleys can be cut in the frames with the regular pulley machine. Some of the advantages of using this pulley are referred to by the makers as follows: They can be used in segment head window frames. They hang the weight in the center of the boxes in circle window frames. They are concealed from view when the window is closed, as illustrated in Fig. 2. Only lacquered face pulleys are necessary, as this is the only part of the pulley that shows. They can be easily removed, if required,

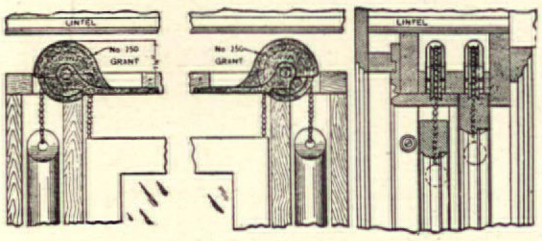


FIG. 2.

after the trim is placed. They require eight inches less of socket room than the side pulleys, and thus an iron weight may be used in many places instead of lead. This, it is said, will save from 100 to 200 pounds of lead to each sash, with a corresponding reduction in the cost of material. They are made in four sizes, with pulleys 2, 2¼, 2½ and 3 inches in diameter, with lacquered, bronzed, Bower-Barff and bronze metal faces. Fig. 2 shows a single frame and section of pulley, which, of course, is concealed from view in use.

Fig. 3 illustrates a twin window without weights in the mullion. These pulleys can also be used in triplet and ouadruplet window frames. Used as in Fig. 3, only 2½ inches of head room

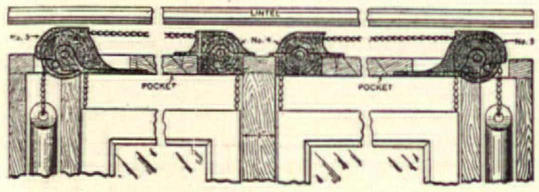


FIG. 3.

is required and even the triplet and quadruplet window frames require but 3 inches head room. Another form of this pulley is made, embodying the same principles, but adapted for metal fireproof windows.

The growing demand for overhead window pulleys has caused the Grant Pulley and Hardware Co. to seek larger quarters; consequently, since May 1st tney have been located at 25 Warren street, New York city, one door west of their old location.

Their advertisement appears in these columns and for reference they would refer you to the following buildings in which their pulley has been used: Flat Iron building, New York city, D. S. Burnham & Co., architects; New York Stock Exchange, New York city, George B. Post, architect; Kuhn Loeb building, New York city, James B. Baker, architect; Mt. Sinn hospital, New York city, A. W. Brunner, architect; Y. M. C. A., New York city, Parish & Schroeder, architects; Blair building, New York city, Carre & Hastings, architects; Yale dormitories, New Haven, Conn

The many advantages of this pulley can be ascertained by referring to their catalogue, whi:h may be obtained upon application.

SAMSON SPOT CORD.

There is probably no article in the building line that sometimes causes so much annoyance as poor sash cords. It is really such a small item compared with many other materials going into the building that its importance is often overlooked, yet it is a matter that architects and builders should give their attention and consideration.

Some architects, when specifying, simply put down "braided cord," not realizing the vast difference in quality or wearing attributes of the different braided cords. The purchase of the sash cord may make a few dollars difference in the cost of a dwelling, but by putting in the best, it will save many times the amount in expense of repairs, to say nothing of the bother caused by broken cords after a few years' occupancy of the building.

The Samson Cordage Works, of Boston, Mass., whose advertisement has appeared on the front cover of this journal for many years, make a special cord that prominent architects have been specifying for ten years and which they are still specifying.

At this time the Samson Cordage Works do not claim to have any new cord, but they do make the same extra grade, only better than ever. This extra grade is widely known as the "Samson Spot Cord," and is used in every case where the very best is desired. Two other grades are manufactured by this company, the "Phoenix," which meets the demand of the man who considers only first cost in his purchase, and the "Massachusetts," a considerably better grade than the "Phoenix."

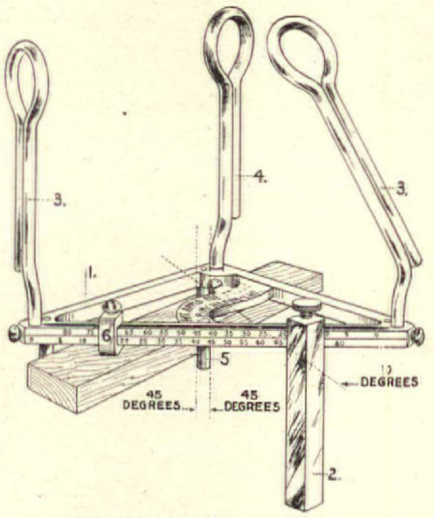
It is claimed that if the proper size of cord and pulley is used as specified in their catalogue, the "Samson Spot Cord" will outwear any other device for hanging windows. A catalogue will be mailed on application.

SMALL MITER BOX.

A new invention has just been perfected and placed on the market by S. B. McHenry, 121 Lincoln avenue, which is attracting much attention among members of the carpenter unions in Chicago. It is a miter box so small and compact and easily handled that it will only mean a short time when contractors may ask their men to take up the use of this miter box.

As will be seen from the illustration, showing a man using the miter box, it is a tool that is very handy under all conditions. Small mouldings and thin boards can be laid across the top of the angle bars to cut them, but with wide and thick pieces the box must be set on top of them and held with the hand, as shown in illustration, unless it is desirable to fasten it stationary on a bench or trestle by means of screws, staples or nails.

The illustration of a miter box in detail as shown in the accompanying cut, is not strictly a true representation of it, at this time, the inventor having improved it by taking off Fig. 6, a lug used only for cutting beveled ends and fixing Fig. 2, the adjustable clamp for cutting all different degrees, in such a manner that it answers for both purposes. In the drawing, Fig. 1 represents the bottom plate which is made of malleable iron. Figs. 3, 4 and 5 are the saw retainers which may be unscrewed and adjusted to suit the user. The board shows the square cut 90 degrees, with the under cut of beveled end.



McHENRY MITRE BOX.

This miter box can be tied to the apron or belt with a string. It is guaranteed to do just as represented. At the present time Mr. McHenry, in order to introduce this miter box in the different towns and states in the United States, will sell a limited number at $1 each. He has a circular which will be sent, showing the miter box as represented here without the improvements, but this reading matter plainly shows what the miter box will do and what is claimed for it, with the exception, of course, that tools now turned out are better by leaving off the lug as shown by Fig. 6.

WOOD CARPET.

"Designs of Wood Carpet, Parquet, Inlaid and Strip Floors" is the title to a neat catalogue sent out by the Forest Citv Parquet Floor Company, 350 Erie street, Cleveland, O. Almost a hundred beautiful designs are shown in this line, which being in color work give a splendid idea of the material turned out by the company.

Combination designs of borders in oak, walnut and cherry; oak, maple and mahogany; oak and walnut, etc. In the carpet, all oak or several different woods may be had.

These floors are used in every class of houses and in all rooms, the dining room and kitchen, and for library, parlor, etc. Their thick parquetry floors are made in tnree ways; the first being simply tongued and grooved, laid in various simple designs; the second being made in pieces usually seven-eighths of an inch thick, cut and fitted together in block from twelve to eighteen inches square; the third and most practical method is to make up as the five-sixteenths-inch goods and glue to a pine backing to give the required thickness. These are called veneered floors, and this is the style used in all elaborate designs, as it admits of a much greater variety than either of the other methods. One of tne best known methods of finishing floors is the hard wax polish. It is easily applied, durable and cheap, and by its use, floors can be kept bright and fresh with far less trouble than with any other finish.

The Forest City Parquet Floor Company make a hard wax floor polish which is the result of a series of experiments made by tnem with the object of getting a composition more easily applied than the old-fashioned bees-wax, still preserving all the better qualities of the latter in addition to its own superior properties, among which are claimed a finer polish, endurance and economv. The makers claim the very best of material are used in its manufacture, it is readily applied and that it will dry in half an hour and produce a brilliant polish.

WHITE SWAN PLASTER.

Until a very recent date, common lime mortar has held supreme control of the Chicago market for plastering walls, except in the finest of fireproof buildings. There have been several reasons for this: First, Chicago has her own lime stone and kilns. Second, every plasterer has been educated in its use, and last, it is the procrastinator's friend, for what he does not wish to do today, can be finished tomorrow.

The Garden City Sand Company, 188 East Madison street, Chicago, are manufacturing a very superior plaster, using Hoovey Michigan plaster and pure white sand and selling same under the "White Swan" brand. This brand of hard wall plaster can be put on the walls, no matter what the weather conditions may be outside—whether warm or cold. Cold weather, just above the freezing point, is better than the use of salamanders, as the water of crystallization should be taken up before the wall dries out. "White Swan" makes a wall ten times the hardness and strength of common lime mortar. It dries quickly and never needs repairs. Plasterers find that it works cool and spreads easily.

The Garden City Sand Company have put their "White Swan" plaster in some of the finest buildings erected this last season, among the list being Hibbard, Spencer, Bartlett & Co.'s new million-dollar building, speculative flats by the score, and many fine residences, among the latter being the home of Mr. J. J. Dvorac, 1249 Douglas Boulevard, Chicago, cut of which is shown with this article. The building was designed by Architect

RESIDENCE IN WHICH "WHITE SWAN" PLASTER IS USED.

James B. Libelka and the plastering was done by James Babka. The Garden City Sand Company guarantees the quality of the "White Swan" plaster to be as represented and their prices are very low compared to the high standard of material.

They make a point of furnishing blank bidding slips upon application and expert hard wall plaster contractors will be sent to bid on work if desired.

RUBBER TILING.

Of the many handsome catalogs which have reached our office, that of the New York Belting & Packing Co., 25 Park Place, New York, is one of the finest.

In order to give an accurate idea of their goods the manufacturers are compelled to show their interlocking rubber tiling in colors and this new catalog is a masterpiece in half tone color work. It shows seven full page half tone reproductions of interiors where their celebrated interlocking rubber tiling has been used. These illustrations are taken from actual photographs and give a splendid idea of the goods as they appear after having been laid on the floor.

Interlocking rubber tiling has been tested in so many different ways that its efficiency is assured and it has been placed in locations where the wear has been most severe, having withstood the wear of thousands of feet passing over it for years. It is noiseless, non-slippery, waterproof, thoroughly sanitary and so durable that it will last practically a life time without requiring repairs. It may be laid directly upon existing floors, whether wood or cement, stone or iron, therefore saving the expense of constructing a concrete floor which is necessary with nearly all other kinds of tiling.

As the material does not require to be laid in cement, the work of laying may be accomplished during business hours without interruption.

For banking rooms, corridors of large buildings, steam shops, yachts, hospitals, billiard rooms, kitchens, pantries, bath rooms, vestibules, etc., it is especially desirable.

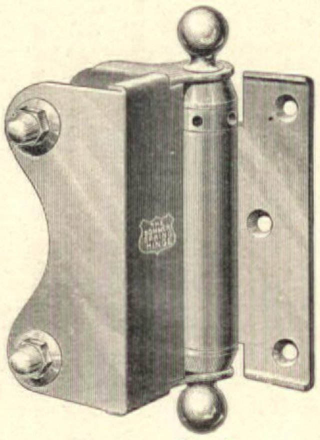
The illustration in their advertisement on another page will give an idea as to the appearance of these goods. The manufacturers will gladly furnish samples and other data upon application.

"BOMMER" ADJUSTABLE BOX FLANGED SPRING HINGE AND STRIKE.

Bommer Bros., 257-271 Classon avenue, Brooklyn, N. Y., have made a valuable improvement in that class of spring hinges and strikes for lavatory trim in which one flange is made box shaped so that it may be clamped directly to the marble partition.

In this new hinge and strike the box flange is adjustable; as the slabs of marble in used in lavatory work vary greatly in thickness, the advantage of this feature is easily apparent.

Where the old style solid box flanged hinges are used, it frequently happens, when the partitions are ready to have the hinges fitted on, that some of the hinges cannot be fitted onto the slabs and the boxes must first be filed out;



BOMMER HINGE.

others will fit too loosely and must be underlaid with card-board, which makes an unsightly job, all because the thickness of the slabs vary.

These new "Bommer" adjustable box flanged spring hinges and strikes solve the problem and save all worry and trouble as to the fitting of the boxes.

A full line of sizes are made, including, 1, 1¼, 1½, 1¾ and 2 inches, each size being adjustable ⅛ inch over and under the stated size.

The strikes are fitted with rubber buffers to take up the shock as the door swings to.

Both hinges strikes are accurately formed on dies from sheet metal, one part of the box sliding within the other in the limits named, the finely finished bolts and nuts clamping the parts securely together.

In addition to the advantages referred to, these hinges are sold at a marked reduction in price from those of cast metal.

Bommer Bros. will send you their catalogue for the asking.

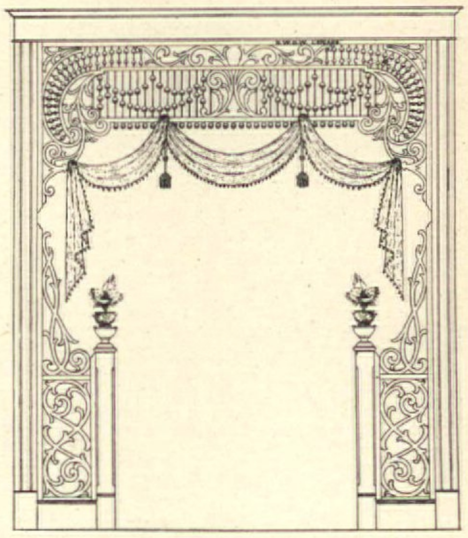
VENEERED DOORS.

The Grand Rapids Veneered Door Company, Ltd., of Grand Rapids, Mich., are specialists in the manufacture of veneered doors and panel work. Their new brick factory, equipped with the newest and most modern machinery, is devoted entirely to this line. Their veneering is done with a 200-ton hydraulic press and with the very best glue. The company state that they make the center or core of the work from sound stock and that it is just as carefully made as the exterior or face. Architects and contractors will see the importance of this last point in door work, as it is impossible to make good sound and strong doors with rotten or defective core and tenons. The Grand Rapids Veneered Door Company, Ltd., have their own dry kilns, with a capacity of over 100,000 feet of lumber, thus enabling them to use only thoroughly dried material. A hardwood veneered door, when properly made and finished, is a piece of furniture, and this company being located in "the Furniture City," they take pride in keeping up the reputation for turning out the highest class of work, both in design and workmanship that can be obtained.

Some twenty-six beautiful designs are shown in their catalogue, which will be sent on application to any architect or builder. An idea of the size of the cuts shown in their catalogue can be had from their advertisement in this journal, opposite the editorials. A special point about their doors is the beautiful cabinet finish used, and for a slight advance in price over the ordinary door an elegant polish can be put on, adding much to the appearance of the room or building. The catalogue will be mailed on application, and an illustration of their doors will be found in their advertisement, opposite editorials in this issue.

GRILLE WORK.

The North Western Grille Company, 1454-56 Milwaukee avenue, Chicago, have issued a new catalogue of attractive designs and styles of modern grille work. Special attention is called to many original and new designs.



NORTH WESTERN GRILLE DESIGN.

The company is prepared to furnish special designs or make estimates on architects' plans and specifications for high grade work in this line. Christenson Bros., the proprietors of the North Western Grille Works, are both experienced and practical men in this line and have a high standing as reputable business men. One reason for their marked success in the grille manufacturing business has been the fact that they give the small order the same careful attention that they do the large one. They use only carefully selected and thoroughly dried kiln-dried woods and every detail in making is carefully attended to.

About seventy designs in grille work are shown in this last catalogue, No. 11. That Christenson Brothers believe in having neat designs is evidenced by the attractive cover on this catalogue.

The accompanying cut is one their No. 149 and gives a good idea of the style and general make up of their work.

S. Keighley Metal Ceiling Manufacturing Company, Pittsburg, Pa., are sending out to the building public a very odd and effective leaflet, which is a good advertisement of their material.

The cover is a coarse butcher's brown paper with some little drawings and letter resembling the first attempts of a small boy in art work. The leaf on the inside, however, is from the very finest paper stock and the design and cut shown are works of art.

The "lock joint" and "lap joint" are taken up and made a point of in a short description of the ceilings manufactured by this company.

This leaflet is one that cannot help but attract the attention of people interested in good ceilings.

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