

An Architect's Suit Decided.

IN the Second District Court, Judge Henry has filed a written opinion in the case of Charles D. Marvin against Dr. Clarence W. Butler and wife. The case was tried in March last. The facts were, that the defendants employed the plaintiff, a New York architect, to prepare plans and specifications for a dwelling-house, to be erected on Fullerton avenue, Montclair. After the plans and specifications were drawn and the contractor's bids submitted, the defendants refused to accept the plans and thereupon the architect demanded the usual commission for his services, on which, being refused, he brought suit. The defence, interposed by the defendants was two-fold; first, that the plans called for a building which, if erected, would project beyond the defendant's lot a few inches; second, that the lowest bid of any contractor exceeded the stated amount the defendants wished to spend on the building. In reply, the plaintiff proved that the measurements of the lot were furnished by Dr. Butler, and therefore the error had been occasioned by the defendant's mistake, and that the changes in the original plans, made at the request of the defendants, had occasioned the increased cost. Judge Henry, after hearing A. E. Van Giesen for the defendants, and E. A. Rayner for the plaintiff, in a lengthy opinion reviewing both the law and the facts, holds that the plaintiff is entitled to recover a reasonable compensation for his services in preparing the plans, etc, and gave judgment in his favor.—*Building.*

Disinfectants.

It is often asked what is the best disinfectant for a cesspool? Two pounds of copperas, or sulphate of iron, dissolved in a pail of water, will greatly assist in purifying a privy or cesspool. A pound of nitrate of lead dissolved in the same way is excellent for sinks, drains, or vaults. Chloride of lime is also effectual, or a layer of charcoal dust will prevent offensive odors arising from any decomposing substance. The quantity of these substances will depend upon the amount of filth to be deodorized, and the length of time during which they will be effectual will depend upon local conditions.

THE JAPANESE HAND-SAWS cut on the pull stroke; so no matter how hard the wood or dull the saw, they will not bend or buckle. It is rather more difficult to saw to line with such saws than with ours, but they have their advantages. Take one of our key-hole or compass saws, cutting on the push or shove stroke—what an aggravating, limber thing it is. Now point the teeth the other way, and you will have a tool that will keep stiff no matter how many knots it encounters or how dull it gets. In other words, the pull stroke of 3,000 years ago is the best for such thin, narrow blades.

Stair Building Made Easy \$1.00

New Law in Tax Titles—No More Extortion.

ONE very important amendment was made by the last Legislature in relation to the issuing of deeds on a sale of property for delinquent taxes:—

"It is now provided that the purchaser of property sold for delinquent taxes, or his assignee, must, thirty days previous to the expiration of the time for the redemption, or thirty days before he applies for a deed, serve upon the owner of the property purchased, or upon the person occupying the property if said property is occupied, a written notice, stating that said property, or a portion thereof, has been sold for delinquent taxes; giving written notice of the date of sale, the amount of property sold, the amount for which it was sold, the amount then due, and the time when the right of redemption will expire, or when the purchaser will apply for a deed. The new amendments provide that the owner of the property shall have the right of redemption indefinitely until such notice shall have been given and said deed applied for, upon the payment of fees, percentage, penalties, and costs required by law. If the property sold is unoccupied, it is then provided that a similar notice shall be posted in a conspicuous place upon the property, at least thirty days before the expiration of the time for redemption, that is, thirty days before the purchaser applies for a deed. It is further provided that the Tax Collector shall not issue a deed to the tax-title purchaser until such purchaser shall have filed an affidavit with the Tax Collector showing that the notice required to be given has been in fact given as required. This affidavit must be filed and preserved by the Tax Collector as other papers are kept in his office. These new amendments will prevent tax-title extortion. Heretofore, when the time of redemption ran out—in one year from date of tax sale—some tax-title buyers asked \$250 for a tax title that cost them \$15 to \$25. Many owners' property was sold for taxes because of their ignorance that the taxes were delinquent. The tax-title buyers will now be compelled to give delinquents notice before they can get tax deeds."

TO MAKE WATCH HANDS RED.—Mix to a paste, over a lamp, one ounce of carmine, one ounce chloride of silver, and a half ounce tinner's japan. Put some of the paste on the hands, and lay them face upwards on a sheet of copper, holding it over a spirit lamp until the desired color appears on them.

ONYX.—Onyx is deservedly a favorite for table tops. Its semi-translucency, with dappled shades from saffron to white, delicate tinge of green and grain formed of wavy lines render it peculiarly attractive.

All varnishes crack from the surface, and paint cracks from the bottom. The presence of ammonia in the atmosphere is the greatest enemy to varnish, as it weakens the cohesion between the oil and gum.

The Safety of Cast-Iron Columns.

THE safety of cast-iron columns in case of fire, as compared with columns of wrought iron, or pillars of stone, brick, or cement concrete, has been the subject of investigation by Professor Bauschinger, of Munich. It will be remembered that the Berlin police authorities, in consequence of unfavorable experiences with cast-iron columns in recent fires at Berlin, issued regulations forbidding the use of such supports in the construction of dwelling houses, but permitting the employment of columns of wrought iron and clinkers in cement mortar. Cast-iron columns may only be employed if they are surrounded with immovable mantels of wrought iron separated from them by an air space. Professor Bauschinger heated cast and wrought-iron columns weighted with burdens usually imposed in structures first to 300°, next to 600°, and finally to red heat, and suddenly cooling them afterwards by a jet of cold water, as applied in extinguishing fires. The experiments demonstrated that cast-iron columns, although they were bent by red heat, and showed transverse cracks when water was applied, supported the weight imposed upon them, whilst wrought-iron columns were bent before arriving at a state of red heat, and were so much distorted by the application of water that a straightening was out of the question. In reality they would have collapsed under the weight they had to support. Professor Bauschinger concludes from his experiments that cast-iron columns, notwithstanding cracks and bends, would continue to support the weights imposed upon them, whilst wrought-iron columns would not. In examining pillars of stone, brick, and cement concrete, the latter prove to be the best. Concrete pillars withstood the action of fire for from one to three hours; those of ordinary brick, as well as those of clinkers set in cement mortar, displayed great resistance; whilst natural stone—granite, limestone, and sandstone—were not fire-proof.—*Illustrated Carpenter and Builder.*

The oftener carpets are shaken, the longer they wear. The dirt that collects under them grinds out the threads. Do not sweep carpets oftener than is necessary. A broom, wears them very much. When a carpet is faded, strong salt and water will often restore the brightness of the color.

George H. Fuller, manufacturer of and dealer in all kinds of office, school, church, and lodge furniture, and fine cabinet work, has removed from New Montgomery Street to 638 and 640 Mission Street. Those desiring things in his line, may rely upon square and honorable dealings and good work, whether under personal arrangements or by orders from sections outside of San Francisco.

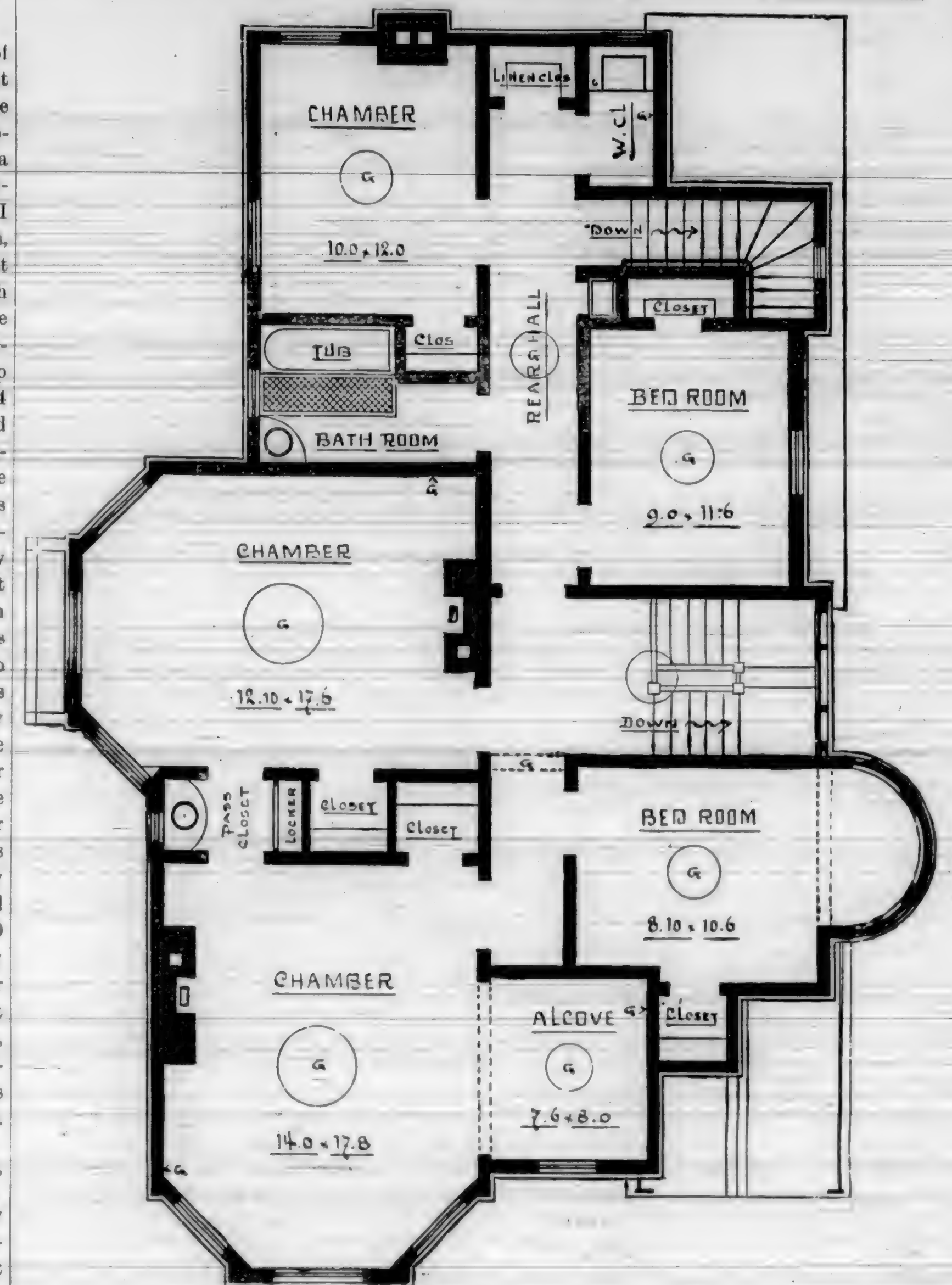
To remove varnish without injuring paint. Brush on spirits of ammonia or hartshorn, which soon softens the oil, allowing of its being rubbed off easily.

Going Up-Stairs.

MANY persons complain of the fatigue of mounting long flights of steps, and feel that they are failing before their time. There need be no anxiety on this score. Going up-stairs is simply performing so much work in a given time. Mr. G. Farmer, who has investigated this subject, says: "Just for curiosity I sent my assistant, who weighed 152 pounds, to climb the stairs at the Forty-second Street Station, to note the time in seconds which was required to climb them leisurely. He counted the stairs, 36, and it took him 34 seconds to climb them. The rise of each step was 8 inches; total rise, $8 \times 36 = 288$ inches = 24 feet. Now, his weight, 152 pounds, multiplied by the total rise, 288 inches = 43,776 inch-pounds = 3,648 foot-pounds of work done in 34 seconds. Now, one horse-power does 550 foot-pounds in one second, and in 34 seconds will do $34 \times 550 = 18,750$ foot-pounds; now divide 3,648 by 18,750, and we get 195, almost 1-5th of a horse power, which this young man exerted while he was climbing these stairs leisurely. He said he usually went up two steps at a time when in haste. Now let us compare this work with that done ordinarily while walking on level ground. His average step when walking rapidly would be not far from 26 inches, and the distance from the ground to the thigh-joint would be not far from 33 inches; thus at every step he lifts his center of gravity $2\frac{2}{3}$ inches—all, or nearly all, his weight above the knees will be raised $2\frac{2}{3}$ inches at every step. Assume that 130 pounds would be lifted $2\frac{2}{3}$ inches at every step, this would equal 341 inch-pounds per step. Now, divide 43,776 by 341, and we get 128.4 steps, which multiplied by 26 inches, gives us 3,338.4 inches = 278 1-5 feet as the distance he would have to travel in 34 seconds to do work equivalent to climbing those stairs. 287.2×3600

"This is $\frac{34 \times 5280}{3600} = 5.58$ miles per hour, which I think is an under estimate. How few invalids—ay, how few tired persons could maintain this pace even for half a minute without great fatigue!"—*Exchange.*

Hereafter the highest building in New York must not exceed an altitude of eighty feet. The law does not, however, prohibit the erection of giant office buildings or great business structures. This may be well, as the convenience of business may require the concentration of offices on a small area, but we feel that the law is an excellent one as applied to the residential portions of the city. With our elevated roads and the probable progress that will be made in rapid transit, there is no occasion for the immense apartment houses that have been built in the last few years. Should the city's population continue to increase as it has done, spread it out over the 23d and 24th wards and lower Westchester, and better and healthier homes will be provided for the people, and it will be far more equitable as regards the rights of adjacent owners.—*Building.*



SECOND FLOOR PLAN OF COUNTRY DWELLING.—PLATE 3.

Next to a good house nothing is more desirable than a good side-walk, but the one is not always accompanied by the other, and hence the incongruity. A bad side-walk is not altogether the result of individual negligence, since the municipal authorities are supposed to have jurisdiction over them, but at the same time property owners should not consider themselves freed from all responsibility. It is no uncommon thing in any large city, to see a house and grounds magnificently appointed and well kept, while the approaches are in a state of extreme dilapidation.

Why are so many houses, especially farm houses, in the United States painted white? A neat white house surrounded by green trees and shrubbery, is often a very pleasing object in

the landscape, but a grim rectangular structure, standing unrelieved as many houses do, receives a glaring addition to its ugliness by the coat of white paint which covers it. Neutral colors are rarely offensive, and easily obtained. Only conservative inclinations cause the present style, and in this matter good taste should not be influenced by bad example.

A metal that expands in cooling is made of lead, nine parts; antimony, two parts; bismuth, one part. This alloy can be advantageously used to fill small holes and defects in iron castings.

Art and Science of Stair Building..... \$1.00
Architectural Perspective..... 350
Leffell's House Plans..... 250

How Mosaic Work Is Made.

ONE of the few industries of Rome is the manufacture of mosaic, the largest establishment being under the control of the church, and employed almost entirely in the adornment of the churches and religious establishments. The process of making a picture in mosaic is very slow, and requires the highest order of skill. To begin with, mosaic is made of glass, and its value consists in being indestructible. The workmen in great pictures, have to have something over twenty-six thousand shades of colored glass to produce the tints requisite, as in a mosaic every color is necessary, the same as in oil painting. To make a picture the process is this: A plate of metal of required size is surrounded by a raised margin an inch in height. A plastic cement of powdered stone, lime, and linseed oil is spread over the bottom of the plate, and that covered with plaster of paris to the level of the rim. Upon this the picture to be made is very carefully drawn, and the mechanic's work begins. He takes a piece of glass of the exact tint necessary, and fits it to its place, grinding it to get the shape. Then he goes on one piece at a time, till the picture is finished; then the face is ground down to a smoothness, and the picture set in its place. Some of the greatest pictures of ancient and modern times are in mosaic, the tints, with all the delicate shades, being as carefully reproduced as in oil, and the effect being even greater. The ceilings of many of the great churches are entirely of mosaic as well as many of the altar pieces and other decorations. As they are entirely indestructible, and never lose their color, they are very much prized. A picture in mosaic costs, but then it is eternal, barring fire and earthquakes. All over Rome there are small shops devoted to the manufacture of mosaic table tops, box covers, etc., the workman toiling all his life on one subject. The man who begins on St. Peter on table tops, or the Coliseum, never does any other subject, and he becomes so skillful in this one subject that he is enabled to make them not only well but cheap. He has only the tints to manage that enter into the one picture, and he places them mechanically and very rapidly.

Plumbers' Association.

THERE are some excellent provisions in the code which govern the Philadelphia Master Plumbers' Association, and new associations cannot do better than to follow it closely in the preparation of their constitution and by-laws, and established associations might take some hints for revision from it. The sanitary committee, which consists of ten members, has entire charge of all sanitary matters pertaining to the trade. They are given power to form themselves into a sanitary plumbers' club. This is the origin of the club, which has already been referred to in these columns. The object is mutual benefit and the discussion of improvements in sanitary plumbing.

This committee has power to add to its number, from members of the association, and to invite well-known sanitary experts to attend its meetings. One of the objects of the association was to establish a plumbers' trade school. For this purpose, a trade school committee was provided, consisting of twelve members, who were given power to elect their own officers, and conduct the affairs of the school, subject to the approval of the board of directors. The good results of the trade schools are already being felt. The plumbers elsewhere should not fall behind in this important matter.—*Sanitary News.*

Improved Tenements in New York.

IN New York, a company has been incorporated with a capital stock of \$150,000, divided into shares of \$25 each, for the purpose of building tenement houses of a superior quality. The president of the company is Mr. Joseph M. Drexel, and Mr. Oswald Ottendorfer is vice-president. The plan, which is one that has been tried successfully in France, is to provide tenements which shall be healthful, and otherwise desirable, at the same prices as are now charged for the miserable quarters, in which so many are compelled to live—\$8 to \$14 a month. The company expects to get a net income of at least 7 per cent. on the investment, and 4 per cent. will be set apart to pay dividends on the shares, the remainder being accumulated as a reserve fund to protect the shareholders; for the benefit of the tenant, who will be credited with interest in proportion to the rent paid by them. These credits the tenant can apply to the payment of rent whenever, "by illness, age, lack of employment, or other good cause, he shall be unable to provide for himself or family." Any tenant can become a shareholder, and the plan is no doubt a good one and deserves the attention of capitalists in all our large cities. A large part of the shares have been taken, and a building site has been selected.

Brick Wall Discoloration.

A CORRESPONDENT in the *American Architect*, in answer to a writer who took the view that the discoloration of brick walls was caused by bricks being burned with coal, says that the whiteness appears equally on bricks burned with wood, and where, in the manufacture, no coal dust is used, and that from time immemorial bricks have thus appeared white. "They were so seen in Boston a century before coal was used, or much known as a fuel by its inhabitants. I assume that, even now, the use of coal dust in the manufacture of bricks is simply local, and an exception to the rule, and in most country places it probably never will be used; yet in special examples of bricks made thus the whiteness appears all the same." He further adds that soda in one of its forms is the cause, and that simple water dissolves it; and that "linseed oil as a coating is an excellent treatment but

the best success has been attained where dilute muriatic acid has cleansed the pores in the bricks, and thus permitted the oil to further penetrate." Speaking of kerosene oil, he said: "This material penetrates the brick to a depth of about a half-inch, where they are of an average hardness, and dissolves the soda, but the oil, lacking the body that linseed oil has, affords much less protection, from the atmosphere, and has proved to be of only temporary value."—*Brick Tile and Metal Review.*

Whims in Building.

NOTHING adds so much, says the *Studio*, to the cost of building as the indulgence in whims. To set out deliberately to do a "queer," "fanciful," or, as it is sometimes called, "original" thing in building, is always to incur unnecessary expense. If we look through the books that contain pictures of the architecture of all ages and nations, we shall find that, without an exception, in the times all men of taste are agreed in calling the good times, the modes of building have been sensible, founded on the needs of the case, and that whatever may seem fanciful—the whole of what we call picturesque—when its charms have proved enduring, is the result of what we may call, in every case, "accepting the situation." Nothing has been done in such instances for the sake of being picturesque. Good building, good ornament, never poses.

In building, as a rule, every departure from the rectangular form is an added expense. One of the things impressed on the mind of a young man who goes into an architect's office to study the profession is that, if cost is to be considered, which it sometimes is and sometimes is not, all excrescences and projections must be avoided. A rectangular house is the cheapest. Bay windows, porches, octagonal or circular external ends to rooms—all these things cost money; and it is by multiplying these features that the expenses of building are often made so great as to deter people from undertaking it, for the things seem so small in themselves, it is not suspected what drains they are on the purse. If a good reason cannot be given for any so-called ornamental feature in a house, if it cannot be shown that something worth while is to be gained by making it, we may be reasonably sure that it is a fancy which will cost, as the country people say, more than it comes to. And, in the greater number of cases, nothing, even in looks, is gained by indulging the fancy.—*Brick Tile and Metal Review.*

A very complete filling for open cracks in floors may be made by thoroughly soaking newspapers in paste made of one pound of flour, three quarts of water, and a tablespoonful of alum, thoroughly boiled and mixed. Make the final mixture about as thick as putty, and it will harden like pauper-mache. This mixture may be used for moulds for various purposes.

Correspondence Special.

BALTIMORE, June 20th.

THE architects in this city are enjoying a harvest of prosperity. Buildings are going up in all directions, many of which are elegant and costly. The style of architecture used is imposing and handsome, without excessive elaboration. I am not a competent critic or would give full description; suffice it to say that there is much work going on, and largely of the better kind.

Knowing you to be a Baltimorean, I thought a line or two of this kind might be acceptable, as coming from the place of your birth—your old home. The changes in the general aspect of the city, its extension in all directions beyond the limits which defined its extent thirty years ago, are wonderful. Truly, progression and advancement is plainly developed in the monumental city. The play-grounds, parks, commons, and barren places of former years have disappeared, and are now covered with houses of all kinds, and still the spread is going on, all of which bespeaks work for mechanics.

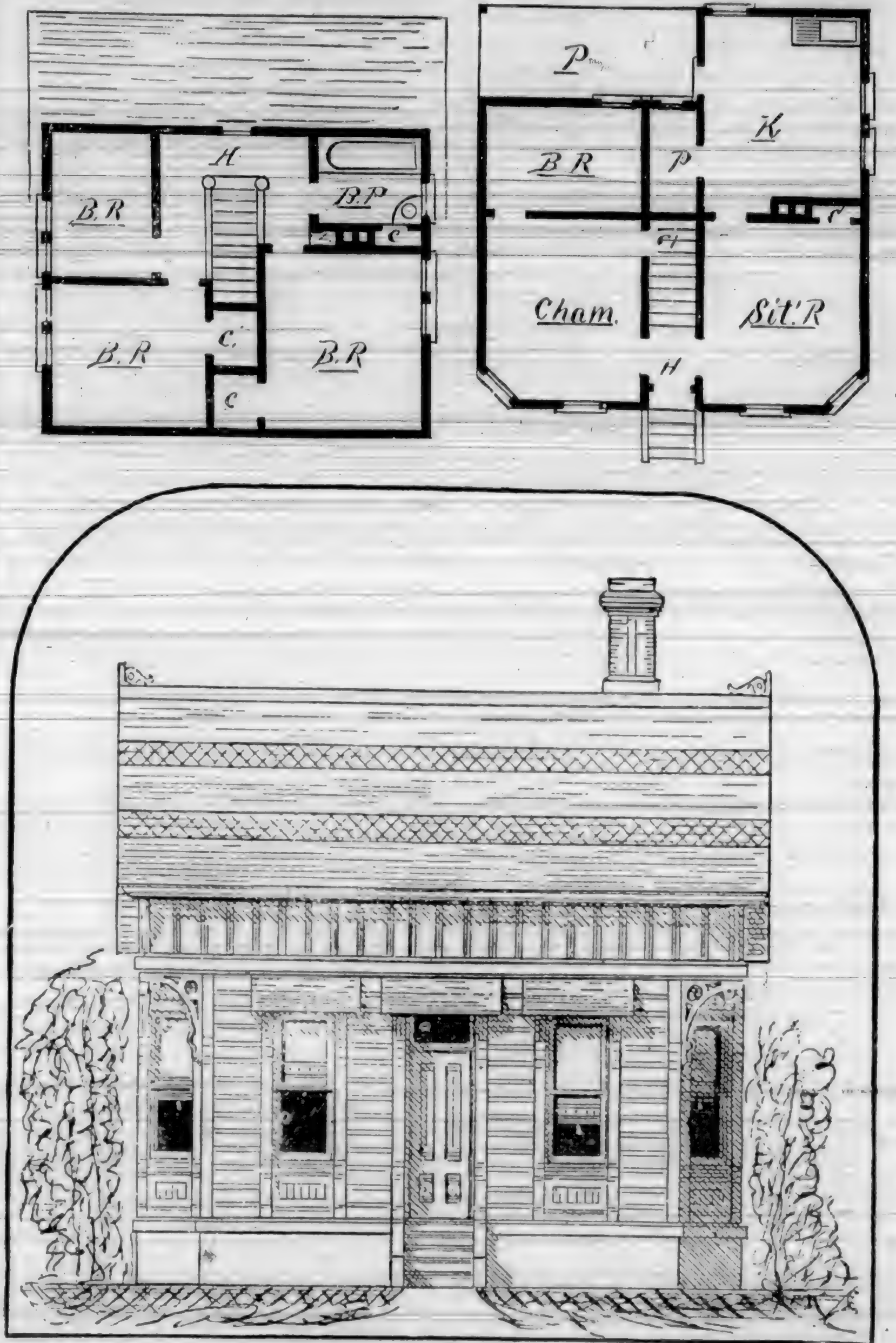
ROBERT.
NEW ORLEANS.

Arrived here all right. Find work very slack. Very little building going on. Journeymen carpenters are working for \$9.00 per week and less, and glad to get work at any price. The mechanics of San Francisco should be happy, as I have not found wages so high anywhere, to say nothing of the loss of time on account of the winter and inclement weather. Men who work for so small wages are, however, able to support their families, and, seemingly, live comfortably. Yours truly,

J. N. D.
SAUCILITO, Cal.

MR. EDITOR: Enjoying the luxury of a week's sojourn at this place, permit me to say a word in its behalf. Nearly all the while that I have been here, the weather has been fine, and generally beautiful. There is a stream of life constantly flowing through this berg, and over the railroad to San Rafael, and intermediate places, upon the arrival of each ferry boat. I am surprised at the number of people who live on these hill-sides; the pleasant weather making it manifest by the number of neatly and bewitchingly tidy dressed ladies to be seen in the pathways, and among the trees; this said—enough; for the sterner sex are never far away, where beauty and innocence is found in such happy forms and characters.

The place is improving, several fine homes being in course of erection or in contemplation. One most handsomely and romantically situated upon the brow of the hill, just above the ferry landing, owned by Mr. W. G. Barrett, is very noticeable, and attracts much attention. The view from all parts of the structure is fine, and from the attic story, unsurpassed, commanding a view of the entire bay, and the long range of hills and valleys up to



ELEVATION OF COUNTRY DWELLING.—PLATE 4.

Mount Tamalpais; and southerly, the northern section of San Francisco from Telegraph Hill to Fort Point. With such a home retreat, an owner may well pray for Sundays and holidays to haste around and tarry long, for if rest and comfort cannot be taken there, then nowhere.

I hear of several projecting building improvements in this locality, and, in time, I think that hundreds will wend their way homeward to this place, and perhaps in still later times, cable roads or some other device will be provided to make access up the steep hill-sides easy.

California as a manufacturing State now ranks as the 25th. There are 1,000 establishments using power. They use 205 water-wheels, of 4,850 horse-power; 990 boilers, 179 engines, with a power of 28,071 horses, making total steam and water-power in horse-powers, 32,921.

NO MORE SKY HIGH BUILDINGS.—Enterprising and speculative owners are now confined by law to a height of eighty feet as the limit of altitude to be applied in the erection of buildings in New York. No more fifteen story traps.

Reflected Sound in Buildings.

VARIOUS instances are given of the mixture of direct and reflected sounds. In the gallery of the Bourse at Paris the confused vociferation of the multitude below is mentioned by Professor Tyndall, who says, "You see all the motions of their lips as well as of their hands and arms; you know they are speaking, but you hear them not. Their voices mix with their echoes into a chaos of noise. It is well known that an audience and furniture both materially deaden the echo. Thus the same authority refers to a lecture delivered in the Senate House of Cambridge, where his voice was not heard at a distant part of the hall. 'The assembled audience, however, so broke up and quenched the sonorous waves, that the echoes were practically absent, and my voice was plainly heard in all parts of the Senate House.'" In St. Alban's Cathedral, the tick of a watch can, it is said, be heard from one end to the other. In Gloucester Cathedral, a gallery of an octagonal form conveys a whisper 75 feet across the nave. The whispering-gallery of St. Paul's is a well-known instance of echoes. The well at Carisbrook Castle in the Isle of Wight, which is 210 feet deep and 12 feet wide, lined with smooth plaster, is a wonderful conveyer of sound; a pin dropped into the well can be distinctly heard. Sound is not only reflected, but is refracted like light, and may be condensed; it can be diffracted or bent round obstacles. Echoes are reflected waves. Echoes may be prevented by cutting off the angles of the room with drapery, by wires stretched across the room to break the waves of sound, and, in fact, by any device which will interrupt the reflection of the sound waves. The method of demonstrating the reflection of sound is by the use of two parabolic reflectors placed opposite each other with their centers in a line; a sounding body is placed in the focus of one of the reflectors, and the sound waves striking the nearest reflector are thrown by reflection to the farthest reflector, and is then concentrated to its own focus, so that an ear placed in this second focus distinctly hears the sound made at the initial point. A vertical wall without break behind the sound and not far removed from its source, resembles a reflector, and is sufficient to cause an echo. Either a recess or a gallery may tend to break this reflection. Unfortunately treatises on sound seldom enter into the question of the means to be taken to remedy echo or promote the transmission of sound in buildings. In large assemblies the principle of the isacoustic curve, one of equal seeing and hearing, appears to give the best results in the arrangement of the seats of the auditors.—*Building News.*

Hand Saws and the Art of Saw Filing. This book gives full information for putting in order all kinds of saws, from a carpenter's panel saw to a steam saw-mill. Illustrated profusely. Price, \$1.00.

Building Superintendence. A new work and one that should be in the hands of every architect, contractor, and student. Price, \$8.00.

Practical Carpentry. As its name indicates, this work presents practical answers to those questions that so frequently vex the mechanic. Price, \$1.00.

Competition for Plans for Public Works.

IN quite a number of towns which need water-supply and sewerage the authorities are trying to shift the responsibility of providing a feasible and proper scheme from their own shoulders to those of engineers and contractors, by calling for plans as well as proposals for construction of works, to be submitted in competition. In some cases a moderate sum is named as the prize to be competed for, and in others the franchise of a company is set up as the reward. This method of obtaining plans is not likely to result in benefit to the public. In the first place, civil engineers of experience in water-works or sewerage designing and construction are not likely to enter into such competitions. Their time is valuable to them, and they cannot afford, nor are they willing, to squander their time in investigating and reporting upon projects on the mere chance of getting a small remuneration, although they might be glad to do the work required with an assurance of the compensation. The bidders in such a case are apt to be either inexperienced young men seeking to get their names before the public, or mere speculative engineers who are working with owners of patent methods. As for giving out contracts for works either of water-supply or sewerage, conditioned only on the execution of a trial test when the works are completed, it is an exceedingly risky and unbusinesslike proceeding. No man or firm can be trusted to do thorough work in these lines without constant supervision and inspection by an expert. It will invariably be found cheaper in the end, for those intending to construct such public works, to secure first a plan and specifications from an experienced civil engineer, and then have the work built under inspection from beginning to end.—*Sanitary Engineer.*

Law in Relation to Newspapers.

1. SUBSCRIBERS who do not give express notice to the contrary are considered as wishing to continue their subscriptions.
2. If the subscribers order the discontinuance of their periodicals, the publishers may continue to send them until all arrears are paid.
3. If subscribers neglect to or refuse to take their periodicals from the office to which they have been directed, they are held responsible till they have settled their bill and ordered their paper discontinued.
4. If subscribers move to other places without informing the publisher, and the papers are sent to the former direction, they are held responsible.
5. The courts have decided that refusing to take periodicals from the office, or removing and leaving them uncalled for, is *prima facie* evidence of intentional fraud.
6. Any person who receives a newspaper and makes use of it, whether he has subscribed for it or not, is held in law a subscriber.
7. The postmaster who neglects to give the legal notice of the neglect of a person to take

from the office the newspapers addressed to him, is liable to the publisher for the subscription price.

Forest Fires.

IF forest fires keep on destroying the woodlands all through the summer at the same rate as they have done during the past month, there is every indication that the loss incurred in this manner by the national resources will throw every other form of fire losses into the shade. The average citizen takes but little interest in the quantity of buildings and manufacturing establishments that are consumed monthly by fire; this is partly due to indifference, and partly to the knowledge that his property is insured; but the interest he takes in forest fires is practically nil. Indeed, what does he care whether thousands and thousands of acres of woods are burned? That does not concern him; it is none of his loss. But when an agitation is instituted against the lumbermen to prevent their cutting the trees—ah—that is something entirely different; that subject is to him about as clear as stove-blackening, but of course he understands it all, and joins heartily in the wholesale condemnation of these horrid lumbermen who want to rob us of our fine forests. As woods are not insured against fires, there is no collection of statistics to show the annual losses, but if they could be obtained we are fully convinced that the total aggregate would be enormous. What are we going to do about it? Let things go as they have gone, without even an attempt to offer some form of check? We have laws, and fortunately they are enforced, to guard against incendiaries, but our forests are considered universal property, and if by accident or carelessness somebody starts a fire, why, they are only trees, such man thinks, and there is no harm done. How many acres of woodlands are burned up during the dry season ignited by sparks from locomotives? How often is a forest fire started because some mighty hunter did not think it worth his while to put his foot on a piece of burning gun wadding? There are dozens and dozens of conditions where a large conflagration could have been prevented by even a very small amount of care, but nobody takes an interest in it. And where is the law that so effectually protects our other property? Why not have it apply to forests as well? They represent money. It seems that a constant agitation of this subject is necessary to insure the amount of attention that must, as a matter of course, precede the institution of any active measures to prevent the constant waste of our forest resources by destructive fires.

Strangers naturally turn to the advertising columns of a newspaper, as they would to a business directory, to ascertain the commercial standing of the place in point of the number and kinds of interests represented, and they turn to the advertisements in a trade paper to see who is wide awake.

The Great Forests of Puget Sound.

IN Western Washington, between the Cascade Range on the east and the Coast or Olympic Range on the west, and between the 47th and 49th degrees of north latitude, is a thickly timbered belt of fir, cedar, alder, maple and other woods. Of these, fir probably represents three-fourths. In the midst of this wealth of forest, nature has placed a broad, deep arm of the Pacific Ocean—Puget Sound—with which it is connected by the Strait of Fuca. Thus not only has nature provided the timber, but the water-way also by which it is possible for the merchant marine of the world to come and obtain their lumber supplies, much of which, some time in the future, must be furnished from these forests. Already the lumber trade with Australia, Central and South America, China, and the islands of the Pacific, amounts to fully 75,000,000 feet a year, and employs a fleet of about 15 vessels every month.

Puget Sound is 200 miles in length, and has a littoral of 1,800 miles. This irregular shore line forms innumerable harbors, splendidly adapted for the erection of saw-mills and other wood-working factories, and also for the establishment of ship-yards. Along this whole shore line, and from thence on both sides as far as the eye reaches, nothing can be seen but the vast and magnificent wealth of timber, save here and there where man has established a mill port, a town, or an occasional farm. In the timber belt of Western Washington there are 20,000,000 acres covered with timber, most of which is included within the limits named—an area nearly equal to the combined areas of the States of Connecticut, Massachusetts, Vermont, and New Hampshire. This timber belt will average 25,000 feet of lumber to the acre, or a total of 500,000,000,000 feet of lumber. Hence the saw-mills of Puget Sound, with their present capacity of 500,000,000 feet a year, would take 1,000 years to cut it down. The fir trees frequently attain the height of 250 feet, and planks of lumber are sometimes turned out of these mills 100 feet long.

Cresote Wood Stains.

SAMUEL CHABOT, JR., No. 70 Kilby Street, Boston, is directing the attention of the trade to cresote wood stains which he is manufacturing. These stains take their name from one of their most important ingredients, namely, cresole or cresote, a well-known preservative of vegetable tissues. It is claimed that this substance unites with the albuminous or sappy part of the wood, which is the first to decay, and forms with it a compound which resists all changes from water or the variations of climate. It also protects the wood against the ravages of insects, notably the white ant of the South. These stains are manufactured in a great variety of colors suitable for exterior use, and their effect upon the shingled villas and cottages now so much

in vogue is picturesque in the extreme. The manufacturer claims for them several important advantages over oil and chemical paints. First is the fact that they are from one-half to one-fifth as expensive as paint. The effect of paint is to form an air-tight screen over all cracks between clap-boards and shingles, sealing them tightly, thus confining moisture under them and sometimes hastening the decay of the wood. It is urged, on the other hand, that cresote stains form no screen, and permit the ready evaporation of any moisture which may come between the pieces. The manufacturer also directs attention to the superiority of stains over paint from an artistic standpoint. He also calls attention to the fact that, stains being in the wood and not on its surface, the color is not liable to discoloration by cracks or peeling off. The stains also have the advantage of bringing out with beautiful effect the natural grain of the wood. The cheapness of these stains, the manufacturer states, combined with their great preserving quality, recommends them for priming wood before painting. Painting can be readily applied over the stains after they have been allowed to dry.

Master Carpenters.

AN article appearing in the June number of this Journal, in reference to the movements of the master carpenters in San Francisco, has attracted considerable notice and comment from Eastern journals. The following from a St. Louis contemporary, who, doubtless, appreciates the facts given in the article referred to, without the courtesy of acknowledgment, publishes the following:—

"The master carpenters of San Francisco have joined together and formed an association, for the better protection of what they honestly believe to be their rights. They consider the practice, prevalent among owners, of buying building material without calling the contractors into the transaction, to be a violation of the spirit of their contract, wherein it is, or should be, understood that the benefits of all discounts on material rightfully belongs to those who have the responsibility of putting it together. A tailor or shoemaker would be greatly astonished by the request of his customer to exercise the privilege of buying the material for a pair of pants or boots, but when lumber, brick, or glass presents such a profitable field for speculation, the love of the owner for the mighty dollar is too strong to allow of technicalities in principle to stand in the way of his saving it. In case of risks or accidents the contractor is generally found to be the under dog in the matter, and is soundly berated if the specifications are not complied with. The 'Baltimore Resolutions' of the plumbers is a model of protection to the interests of the master mechanic, and they are all gradually recognizing the fact that a resolution of some kind will soon become necessary to keep them in fresh bread and butter. The master

carpenters of St. Louis could kick each other awake to many abuses they are subject to, and follow the example of their brethren in San Francisco in resolving what shall be, instead of quietly talking of what should be."

Health Officer Wight, of Detroit, Mich., is making war on the ice-dealers who cut ice below the city, where it is claimed the water is contaminated by the sewerage. He has asked the Common Council to enact an ordinance to prohibit the sale of ice cut below Belle Isle, an island in the Detroit River above the city. The aldermen and councilmen have made the tour of the inlets and bays up and down the river where ice is cut in the winter season, obtained samples of the water for analysis, and propose to co-operate with the health officer if it can be found that his position is tenable. The question has brought up a discussion between the doctors as to whether the water is filled with bacteria, one faction claiming it is not, while the other takes the opposite ground. The ice-dealers, who see a possibility of their winter harvest-ground being cut off, are taking a prominent part in the agitation. Health Officer Wight has also been doing good work in the way of fumigating the sewers, having burned 1,000 pounds of brimstone for this purpose.

Always Pay and Save Money.

THE publisher of the *East Oregonian* had a subscriber who repudiated \$1.56, claimed to be due for the paper. The delinquent was saucy and the newspaper men got upon their mettle and sued the aforesaid delinquent. The case was fought by nine lawyers for the defense and two for the prosecution. The plaintiffs got a verdict for the amount claimed, and the defendant had to foot a cost bill amounting to \$74, besides the fees of nine lawyers. The moral of this case is that those indebted to newspapers for subscription will find it more economical to call and settle than to attempt repudiation.—*Ex.*

THE DECORATOR AND FURNISHER, published in New York, is a most excellent journal, always full of interesting matter and illustrations. Its June number is specially interesting, containing a description of a Long Island home, with illustration views, an exhaustive and pleasantly written description of modern iron work, with general examples, reference to the art work of the Society of Associated Artists, and some admirable designs for ladies' home work, crazy quilts, plaques, etc.; also practical designs for easels, bedsteads, dressing cases, wardrobes, picture frames, sideboards, etc., and much of interest of artistic and Htefary value. Those desiring can order same through this office.

The reel of wire rope for the St. Louis, Cable Road is said to be the largest in the world. It weighs 89,510 pounds, and was shipped from Trenton, N. J., on a car weighing 35,000 pounds on sixteen wheels.

Trees and Rainfall.

Professor Brewer, of New Haven, has reported the results of a number of experiments on the results of soaking green wood of various kinds in cold water, and thus removing the albuminoid matters. That green lumber contains something which greatly favors its decay, and which may be removed by long-continued soaking in water, was well known many years ago, and gave rise to the process of water-seasoning, in which the planks were sunk in large bodies of water and kept immersed for from six months to a year, when they were raised, piled in the air, and thoroughly dried. Flooring lumber thus treated is little liable to decay, for the simple reason that it contains little or nothing that is fit for the food of the micro-organisms and fungi that cause decay. The albuminoid material which may be thus extracted from wood appears to support the life of various micro-organisms which, so far as we know, are not directly or indirectly injurious to health. We can only infer that it will also support the life of other organisms which may be injurious

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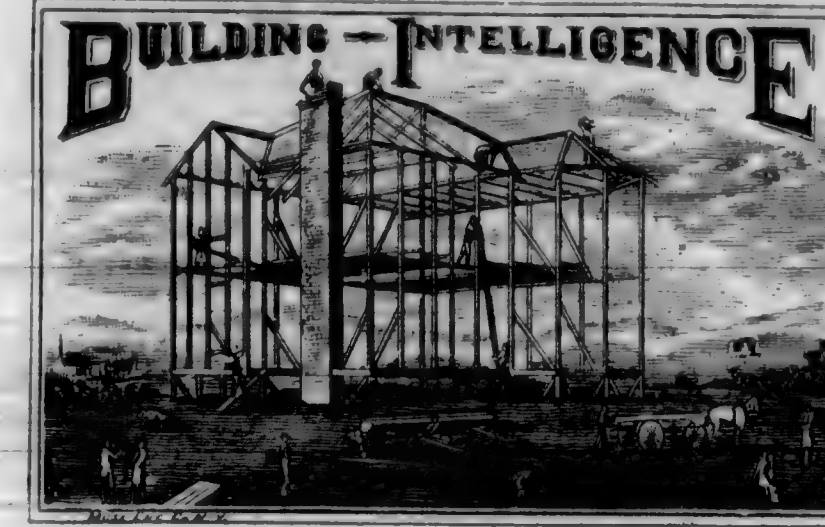
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KELSO, JOHN, Grader.....	" 76
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The alterations reported in our last issue as going on, on the corner of Market and Golden Gate Avenue, should have read Market and Turk.

A.—J. H. Littlefield.	O.—Gas. Musto.
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\$1,200.	C.—Anderson Bros.
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O'Farrell, near Powell. Three-story frame. O.—F. Tromer. A.—H. D. Mitchell. C.—R. McCann. \$8,000.	C.—Cook Bros. \$1,200. Twenty-sixth, cor. Valencia. Two-story frame. O.—C. Crowley. A.—M. J. Welsh. C.—W. H. Barrett. \$4,000.
---	--

West Berkeley—Two-story frame. O., Wm. Schrof; A., Wm. Schrof; C., C. Lord; \$1,300.

Eureka—Two-story frame. O., S. Acheson; A., S. & J. C. Newsom; C., Butterfield Bros.; \$6,000.

Healdsburg—Three-story brick. O., City and County; A., S. & J. C. Newsom; C., E. Hall; \$15,000.

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The California Architect and Building News.

VOLUME VI.
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Building Report for August, 1885.

As shown by the itemized statement elsewhere given, the number of building, alteration, and repair engagements reported since last issue is as follows:-

August, 1885, 83, with total cost of \$347,600
July, " 99 " " " 412,050

These figures show a shortage in August as against July, of \$64,450. But the July report included a single brick warehouse costing \$70,000 for specially private purposes, located outside of the more active business center, and although a factor in the total of building operations within the city, it may consistently be excepted from the general list, which would place August, 1885, \$5,550 ahead of July. Again, the report for August, 1884, made the amount of building investments for that month 83, at a total cost of \$635,411, a difference of \$287,811 in favor of August, 1884; but in that amount was included the Murphy Building, at \$300,000. Consequently if the cost of this one building is deducted from the total of \$635,411, the balance in favor of August, 1885, will be \$14,189. All of which goes to show that the general building prosperities, outside of special large jobs, continue unabated.

Notice to Correspondents, Subscribers, and Patrons of this Journal.

A CHURCH HAVING OCCURRED IN ITS MANAGEMENT, GEO. H. WOLFE RETIRING.

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For convenience sake, use only - CALIFORNIA ARCHITECT, 240 MONTGOMERY STREET, S. F., as that alone will ensure prompt delivery.

The oldest paper in the world, the *Pekin Gazette*, has lately taken a new lease of life. The venerable journal, alone almost in a changeless land, has changed its form. Established in the year 911, the *Pekin Gazette* has been published regularly since 1351. Under the new arrangement three editions are published: the first, the *King-Paou*, printed upon yellow paper, constitutes the official gazette of the Middle Kingdom; the second, the *Hsing-Paou* (commercial journal), also printed upon yellow sheets, contains information interesting to the trading community; while the third, the *Titani-Paou* (provincial gazette), printed upon red paper, consists of extracts from the other two editions. The total circulation of the three is 15,000 copies. The editorship is confided to a committee of six members of the Academy of Han Lin.

The Future in Building Operations in San Francisco.

THE deep interest and concern felt in the building prospects of the future, are clearly manifest in the earnestness with which inquiry is made by owners, material men, and building mechanics generally, for the purpose of finding facts, theories, and arguments upon which to base conclusions as to the probabilities, and settle and solve the material question of degree of future decline or prosperity in building activities. There has been so prolonged a period of "good times" that a foreboding comes to many that, in the natural order of things, there must be a letting up; - a resting time to permit the equalization of demand and supply.

Owners are anxious for light upon the subject, many being willing, and having the means to improve, yet fearing that "the thing has been overdone;" and material men are eager to learn, so as to be able to judge correctly the facts most likely of realization in the disposal of materials, so as to regulate supplies, and avoid the involvements of over-production; and mechanics most naturally are anxious, as upon the quantity and permanency of employment depends, with them, the daily support and comforts of themselves and loved ones.

To all this there can be no reliable answer or assurance given. It is not within the reach of human wisdom to reveal the hidden mysteries of the future, nor to foretell the things that are to come to pass. But it is within the province of human speculation and judgment to determine the probabilities, and from the advantages of practical experiences and familiarity with the facts of the past, and a fair understanding of the present, to arrive at conclusions most likely to be realized.

The song of the "croakers" is, "Too many houses, too much building, and ere long there will be a tumble so mighty, and a fall so terrible, that thousands will be crushed beneath the great avalanche that is sure to come." But this sort of music has been sung so long, and by voices so cranky and unmelodious, that the strains have become discordant and inharmonious; and while these dull sounds have been echoing, the more sensible, enterprising, and progressive people have gone on - built and rented, and are reaping the golden harvest that renting to good-paying tenants yields.

An abatement in the great rush of building which placed the investments of the first six months of 1885, \$1,267,889 ahead of any like period in San Francisco's history, so far as shown by any authentic record, was to be expected, and should be received as one of the

natural and reasonable outcomes of a too universal eagerness among lot owners to take advantage of the low price of materials, and avail themselves of the many inducements to improve vacant lots. There is a proper limit for everything, and when the boundaries are overstepped, the fields of excesses are reached, and those who enter therein must necessarily become discouraged, as nothing fictitious in life affords permanent satisfaction, particularly when it reaches the pocket and purse. It is mainly in this direction that the shrinkage manifests itself, and not in the erection of buildings for homestead purposes, there being a large number of the latter at present in contemplation; and it is not only fair to presume, but a fact certain to be realized, that many fine residences will be commenced before the end of 1885.

Consequently there is good encouragement for those interested in building operations, with scarce a doubt that good mechanics in all the branches of house building will find continued employment, which also means fair trade and transaction for dealers in all kinds of building materials. And with the fact in view that there is but slight decline in rent rates, and this only in houses built years ago, and lacking in many respects the better and more modern improvements in house fittings, particularly in sanitary appointments, there is no occasion for owners to fear that houses conveniently arranged, and built to suit the popular demand, will suffer long for want of satisfactory occupants.

Angelo and the Cardinal.

UNDER the papacy of Julius III., the faction of Michael Angelo's rival, San Gallo, gave him some trouble respecting the building of St. Peter's, and went so far as to prevail on the pope to appoint a committee to examine the fabric.

Julius told him that a particular part of the church was dark. "Who told you that, holy father?" replied the artist. "I did," said Cardinal Marcello.

"Your eminence should consider, then," said Michael Angelo, "that besides the window there is at present, I intend to have three more in the ceiling of the church." "You did not tell me so," replied the cardinal. "No indeed I did not, sir," answered the artist; "I am not obliged to do it and I would never consent to be obliged to tell your eminence, or any person whomsoever, anything concerning it. Your business is to see that money is plenty at Rome; that there are no thieves there; to let me alone; and to permit me to go on with my plan as I please."

"Ah my little man, good-morning," pleasantly remarked an old gentleman as he stopped and patted a Hewes Street little boy on the head, "have you any brothers and sisters?" "Yes, sir; got four, but I'm the only one that 'mounts to anything," replied the urchin.

Cumming's Details..... \$6.00

St. Peter's, at Rome, is situated on the ancient site of the circus and garden of Nero, where that tyrant massacred numbers of Christian martyrs. Tradition says that the bodies of these martyrs were buried by their faithful friends in a grotto near the circus, and that among those who were thus buried here was the crucified apostle, St. Peter.

In 306, Constantine founded a church over the reputed grave of the holy apostle. This edifice remained eleven centuries, when Pope Nicholas V., in 1450, demolished it, and laid the foundation for the present St. Peter's. At the death of this pope, the structure had been elevated only four or five feet above the pavement. The work was suspended, or made but little progress, till the time of Julius II., who, in 1503, employed the celebrated Bramante to carry on this great undertaking.

This architect formed the original plan of the cupola, and caused four stupendous pillars or piers, two hundred and nine feet in circumference, to be raised to support it. The patron and the architect both died and left it in this state.

Leo X. employed architects to carry on the work, among whom was the celebrated painter Raphael d' Urbino, who strengthened the basis of the pillars, which he deemed too weak to support the stupendous cupola.

Various other architects were employed by the pontiffs who succeeded Leo, until, at last, Paul III. committed the edifice to the incomparable genius of Michael Angelo Buonarroti, who designed the dome and cupola as they now stand. He wished to make the front like the pantheon, but death removed him from his labors, and the sublime idea was abandoned. Michael Angelo "left it an unfinished monument of his proud, towering, gigantic powers; and his awful genius" seemed to watch over his successors for a long time.

Many other artists were employed upon this stupendous edifice, until it was finished, under Paul V., by Carlo Maderno. Three centuries and a half this church was being built; and, in 1694, the cost was estimated to have been eleven million pounds sterling, or about forty-nine million eight hundred and forty thousand dollars.

This edifice contains the best specimens of designs of the ablest architects who flourished during a period in which the revived classic style was carried to the highest perfection which it reached in Italy. The extreme length of St. Peter's is seven hundred and twenty feet; breadth, five hundred and ten feet; height, from pavement to the top of the cross upon the cupola, five hundred feet.

Laborers are not anywhere a unit on reform measures. In Austria they are protesting against the reduction of the hours of labor from fourteen and twelve to eleven; to the law forbidding women and children from performing the severer parts of work, and they object to a Sunday holiday. If so, such slavery to toil should all the more be checked by Government interference.

Los Angeles.

Its Building Interests.—The accompanying facts and figures, while specially interesting to the firm of Kysor & Morgan, architects, also possess common interest to the inhabitants of that section of country generally, and co-relatively, to the people of the entire State of California.

The firm above named reports that during the years 1883-84, the buildings planned and superintended by them aggregated a total cost of \$1,687,000.

Buildings Just Completed.—The Sisters of Charity Hospital, \$80,000; residence, Jasper Harrel, \$34,000; Davies-Henderson Lumber Company's Building, \$15,000; Roder Block, \$9,000.

Under Way.—Residence, H. D. Barrows, \$5,500; Gilmore building, Fred Gilmore, \$8,500; res., H. C. Wilner, \$7,500; res., R. Mercer, \$2,000; res., Niles Pease, \$4,000; cottage, Mrs. Eberly, \$1,500; res., A. Clark, \$4,500; addition to Capitol Mills Warehouse, \$17,000; winery and distillery, B. Dryfus, Anaheim, \$35,000.

Prospective Work.—Brick building, J. Bryson, \$45,000 to \$60,000; E. Germain, \$30,000; one of \$75,000; one of \$22,000; residence, J. B. Lankershin, \$15,000, with \$7,000 added for outside improvements, stable, etc.; res., Dr. W. F. Edgar, 44x82 ft.; res., J. L. Sheward, \$8,000; improvements to res., O. W. Childes, \$8,000 to \$10,000; res., John Brewer, \$2,000; res., H. L. Drew, \$10,000.

This is a very splendid business showing for a single firm of architects in a city somewhat remote from the great through line of travel and the center of commercial intercourse. If to this is added the amount of building values controlled by the several other resident architects at Los Angeles, and those handled by architects from San Francisco, the aggregate would be large, and serve to establish the fact that the county of orange groves and vineyards has and is enjoying a full share of the general prosperity which has been experienced throughout the State of California since 1880.

No better evidence of advancement and prosperity can be found in any city or section of country, than the erection of large numbers of substantial dwelling-places, from the unpretentious cottage sheltering the toiling workers and their loved ones, to more magnificent residences—perchance mansion-like in proportions and appointments, where wealth brings luxury and ease, if not the more-to-be desired and sweeter comforts which make life joyous and happy among those whose great treasure is contentment. All these proclaim growth and advancement, for men of mind and purpose build not as hermits,—alone in solitude, estranged, shut out from fellow-kind, lost to all aims, ambitions, emotions, and endearments worthy of noble manhood.

But private residences speak of more; they are not found clustered in barren wastes, nor sandy deserts, but in localities and places where

active business centers, and men by trade, commerce, mechanical, agricultural, vinicultural or other pursuits, gain riches and become more or less wealthy, and of necessity stores, business constructions, public buildings and edifices of greater or less extent and character must exist, to accommodate the ever moving and ceaseless demands of trade and traffic, all tending in the one direction, to enrich and make happy the thousands who mingle in the general interest.

In addition to all this, Los Angeles has gained an enviable and almost world-wide reputation for its salubrity of climate, fertility of soil, luxuriousness of orange groves, vineyards, orchard and field productions, and is destined to assume a rank of great importance among the cities of California. If the rapid advance made within the past three or four years continues, with no relaxing of energy and enterprise on the part of the inhabitants and interested parties, the next ensuing decade will record a growth and prosperity for Los Angeles of very great proportions. How great, as compared with the other cities of California outside of San Francisco, we shall not attempt to predict, leaving that to be developed by the evolutions of time and circumstances, and the efforts, energies, and enterprises of the people of the respective places. Nature has furnished the groundwork of greatness; it therefore remains with those who possess and occupy the land, to utilize and improve the special advantages and opportunities so abundantly strewn around them.

Los Angeles—Continued.

THE reports from which we gather the items herewith accompanying are lengthy, giving, in detail, the sizes, style, and general description of the buildings mentioned. This it would be impossible for us to do without sacrifice of other matter of more general interest. Consequently we simply state the prominent facts—owner, architects, and cost. As described, some at least of the edifices named are or are to be very nice affairs, and would be creditable to any street in San Francisco, if erected in this city.

Messrs. Boring & Haas, architects, report in course of construction a thirty-five room addition to Long Beach Hotel, at a cost of \$10,000; also cottages for Long Beach Co., \$7,000.

MOTT MARKET BUILDING, 62x128, cost not stated.

THE UNIVERSITY OF SOUTHERN CALIFORNIA, on which work was stopped for want of funds, is about to move on again toward completion, money in part having been raised for that purpose.

MOTT & SPENCE BUILDING, brick structure with stone facings, \$24,000.

COTTAGE for Mr. D. E. Thompson, \$3,000. A SCHOOL BUILDING for Prof. D. W. Hanna's college, \$2,000.

Among the buildings to be erected by the

same firm is a \$30,000 sanitarium; a residence for Mr. L. Stuart, \$7,000; a residence for Mrs. M. A. Hoadley, \$6,000; residence, F. Morrison, a wealthy ranchman, 75x50 feet, cost not stated.

All of which, together with other improvements noticed, show a very considerable degree of building activities in and around the city of Los Angeles. We are pleased to learn that our professional brethren in the localities named are "so busy," and hope that the shadows of their professional success may never grow less.

San Diego—Good Showing.

A COPY of the San Diego Union, of June 17th, containing a nearly two-column statement of building improvements in that city, was duly received but accidentally mislaid; and being favorably disposed toward the most southern metropolis of the State, through the courtesy of Mr. J. A. Kookan, a second copy was obtained, from which we gather the fact that the number of buildings erected in the recent past, now under way, and positively to be built, together with a few alterations and repair jobs, number about eighty-five, with a total expenditure of nearly \$289,000, including in the number some very nice residences, in cost ranging from \$2,500 to \$15,000.

Although San Diego is the tip of the south wing of the State of California, the foregoing facts and figures show a pleasing degree of prosperity, which, while not so large in volume as other places nearer the great central business mart of the State, it should be, all things considered, decidedly gratifying to the people of that section. A community of people enjoying all that can be desired in salubrity and healthfulness of climate, fertility and fruitfulness of soil, beauty of harbor, and almost every natural, local advantage for life, health, and comfort, must in time reap the rich harvest that ever flows in such channels. To bring about more brilliant results quickly, will require indomitable energy, persistent effort, and a determination upon the part of all concerned, particularly the "leading men,"—those who direct and control public sentiment, and lay out the work necessary to be done. The common and general interests of San Diego, perhaps, require the presence and co-operation of one or more specially qualified men, with grasp of intellect, foresight, judgment, and every other quality of mind and heart necessary to handle and solve all present problems as to the future best good of San Diego, and give vitality to movements that will for the present modify, and finally overcome the disadvantages which have thus far held the destinies of the place in check.

The people of San Diego, and of every city, town, village, and hamlet, and of the whole country, should ever remember that the entire nation was at a time shrouded in gloom, no one being found "sufficient" to break the

bands of almost universal despair, until the immortal hero for whom the nation yet mourns rose equal to the occasion, and rolled back the deluge that threatened to engulf the nation's life and liberties. So in communities, with the right man in the right place, laying siege to all obstacles, victory is sure to follow.

DULL TIMES EAST.—Nearly every one of our Eastern exchanges makes reference to the "prevailing dull times," some predicting a continuance and increase of the stringencies, while others take a more cheerful view of the situation, and claim that encouraging signs of business revivals are apparent, generally. In support of this, statements are made that certain manufacturing establishments are enlarging and preparing for full capacity operations, and that the near future will witness a return of brisk times. It is to be hoped that the better condition of things will be realized, and that the tens of thousands of wage earners who have been out of employment will soon return to their places and find steady and constant work.

In California, there has been no such labor panic as is and has been reported to exist in the Eastern States. And had not the dullness in other sections of the country "driven" thousands of workers to this coast, the supply of labor here would at no time have exceeded the demand; and, even with this influx added, the good and competent men have, generally, found steady employment, the idle ones being mainly of the class first laid off, when pressing necessities for their services do not exist,—to all of which the fact may be added that the cutting of wages on this coast has been less than elsewhere, and the pay maintained, averaging greater than in any other well settled section of the country. But it may be further added, by way of caution, that mechanics who come hither must expect to take their chances in finding employment, as all labor avenues are full—some to overflowing.

Sub-Letting Plumbing Work.

The feeling continues to grow against the practice so fatal in its consequences, of master plumbers sub-letting contracts to irresponsible parties. The Minnesota Architectural Association last winter took strong ground upon this important subject, and the associations of other States, as well as several chapters of the American Architects' Institute, have since taken the matter up and added their protests. The "skin" plumber, or, more properly speaking, his employer, is responsible for much of the sickness and death so prevalent in all cities. "Cheap and nasty" may do for the contractor, but it is financial ruin if not death to the property-owner. In time, perhaps, the botch plumber, the botch bricklayer, and the botches of all other trades will be relegated to their proper places, and then will come the era of prosperity for good, honest, conscientious mechanics.

Prices of Building Materials.

THE condition of the material market having much to do with building activities, and the question being continually asked by those contemplating improvements, in general terms we reply. All kinds of materials are low. Lumber is being sold at exceedingly seductive rates, and bricks are much below former prices, while all other lines of materials are in sympathy with the "dull times" so frequently quoted, and the demand for cheapness.

The cry of "dull times" in California is an anomaly; for while the talk runs in that direction, there are but few who are not doing well, and thousands have money to invest in projects assuring fair returns.

BUILDING LABOR.

The supply of workers in all the branches is fully up to the demand, and in some the supply is in excess; consequently the rates of wages at present are considerably below those ruling two years ago. So that those who wait for more favorable advantages, will need to pray for a return of the Dennis-Kearney period, when workers were glad to find employment at any price, and but few ventured to break the sod on their real estate, for building purposes.

EMPTY HOUSES.

The return of absentees from the Springs, summer vacations, etc., is manifesting itself by the decrease noticeable in the number of "to let" signs on houses to rent; and it is fair to presume that by the end of the summer months, and the return of those who have been off on tours of travel or pleasure, but few empty houses will be found in San Francisco, and these will be the less desirable, old fashioned, "too large," poorly arranged, and undesirable places. The fact is not sufficiently considered in this connection, by those who argue that there "are a great many empty houses;" that the old time, out-of-date buildings are apt to go begging for occupants, while acceptable buildings on the same lots would find ready tenants. Under the general conditions of the times, renters are not willing to occupy houses built many years ago, which are so much inferior in so many respects to those of later construction containing so many more conveniences and modern improvements. Still, in the general count of unoccupied buildings, the merest shanty, with from one to ten "to let" signs posted on its portals, front, and fences, swells the aggregate as much as though displayed on a first-class tenement. This class of houses is somewhat analogous to spavined horses—not in demand; nobody wants them unless they can be had very cheap. Take away all this kind, and there would not be a sufficiency of houses to rent in San Francisco to supply the demand.

A Cubic Inch of Gold.

ONE cubic inch of gold is worth \$210; one cubic foot, \$312,380, and one cubic yard, \$9,796,762 (counting the ounce at \$18).—*Jeweler's Circular.*

Sidewalks.

IN all large cities—as a rule—other than San Francisco, the sidewalks are laid of material more durable than wood—brick, natural or "patent" stone, asphaltum, and other similar materials, consequently a reference to sidewalks laid of wood would seem strange to those of our readers who have never seen anything of this sort on the public streets. Nevertheless it is a fact that many scores of miles of wood sidewalk are still in use in San Francisco, although on nearly all the principal business thoroughfares they have been replaced—mainly by the "patent" or artificial stone pavement, and in the residence portions of the city, the same process of substitution is rapidly going on. In nineteen out of every twenty cases of good class, new buildings, whether erected for personal use or renting, stone sidewalks are adopted.

The reasons why this is done are several,—appearance—"looks"—perhaps, being the first, for they do most certainly add greatly to general effect, and give tone and character to the improvement. Besides this, owners understand the fact that while the stone sidewalk is more expensive in first cost, the additional outlay over wood is fully compensated by increased durability, to say nothing of the greater satisfaction and comfort enjoyed. But the most essential feature and quality of impermeable sidewalks, is sanitation. Any sidewalk material that absorbs and holds moisture should be rejected and condemned from sanitary considerations; and in this particular, there is nothing worse than wood, not even the exposed ground and gravel; for the moisture taken in and stored beneath the planking is detained from contact with the pure atmosphere and the process of rapid evaporation, and remains to decompose, and be drawn out by exhalation by the forces operating under the natural laws of sunbeams, and the warmer free air above, in a vitiated condition; while the impermeable pathways resist absorption, and retain on their surface or quickly shed all fluids and liquids until they are disposed of by the forces acting upon them, without deterioration or prejudice to healthful conditions.

Pressed wood the best. But so long as wood sidewalks are permitted they should in all cases be laid of dressed or surfaced lumber, for the reason that, in the surfacing process, the lumber passes under a certain degree of pressure, which compresses the wood greatly, besides the solidifying effect of the planer; and the fact is well understood that all kinds of wood and fibrous materials are made more solid, tougher, and consequently more durable, by and according to the degree of pressure to which they are subjected.

Dressed sidewalks the cheaper. The cost of surfacing should not be considered, as those that are so treated last and wear much longer and better, to say nothing of the greater satisfaction afforded in their use; and the smoother surfaces shed the water more readily

with less absorption, thereby removing, to some extent, the objectionable features of wood sidewalks.

Contracts as a Whole, or Segregated.

AN abuse which of late years has grown into troublesome proportions is that of letting building contracts in the lump to some one person or firm, who are held responsible for the completion of the work in all particulars according to specifications. The contractor sub-lets the various portions of the work to others, each making a specialty of some particular portion thereof, and each responsible to the general contractor. First comes the excavator, then the stone-mason, then the iron founder, then the stone-cutter, then the carpenter, then the bricklayer, then the roofer, then the plasterer, then the glazier, and finally the painter. The pay of each depends upon the thoroughness of the work performed by those who precede him. For instance, the painter having completed his work—an event for which all the others have patiently waited—it is discovered that the mason, the bricklayer, the carpenter, or some one else has either skimmed, jerryed, or otherwise shirked the details of his part of the contract, whereupon the owner, the architect, and the original contractor confer in regard to the matter. Such conference may continue for a day or for a month, and end in the acceptance of the job or disagreement; but all the time the sub-contractors who did their work well are compelled to wait for their pay, and in many instances their workmen also are put off, thereby entailing suffering upon their families. The system is all wrong, and the sooner it is reformed the better. Let the owner award the separate contracts himself, and settle with each contractor upon completion of his portion of the work. Then, if a hitch occurs, the innocent will not have to suffer for the guilty. Let exact justice be done to all, without favoritism or unnecessary delay. These hints are thrown out because the frequent and bitter complaints we hear from all sub-contractors and journeymen, and we hope that those in a position to rectify the evil will lose no time in taking proper action.—*Western Architect and Builder.*

Experienced lumbermen have always held that timber cut in the spring was not durable for building purposes. Recent scientific investigations sustain this belief. It is shown that the richer the wood is in phosphoric acid and potassium, the more likely it is to rot and mould; wood cut in the spring contains eight times as much of the former and five times as much of the latter as when cut in the winter.

"What a wonderful thing the electric light is!" "Yes, it is wonderful. I expect after a while it will be used to make the crops grow, instead of the sun." "There are some crops now that thrive by electric light." "Nonsense." "No nonsense about it. There are lots of young men who sow most of their wild oats by the electric light."

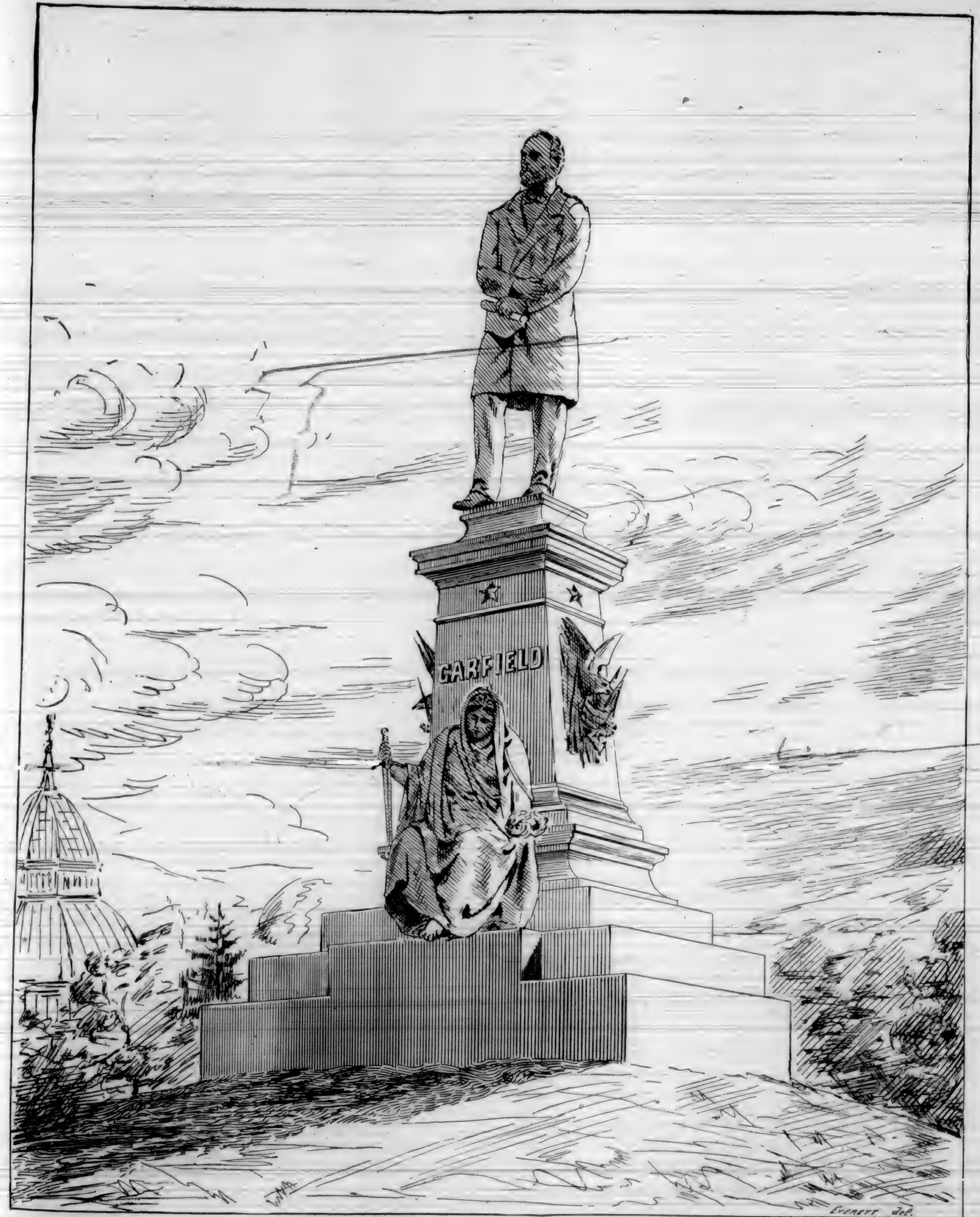


PLATE I.—THE GARFIELD MONUMENT.

Plumbers' Movement.

THE essence of the plumbers' movements, which has, perhaps, attracted more attention for the past two years than any other effort to advance the interests of sanitary science, is well stated by President Allison, of the national association, in a recent interview. He says: "Our objects are simply to inspire and elevate the plumber and the public into a realizing sense of their duties with reference to correct sanitation, and, in order to accomplish them, we require education for both and legislation. The work is necessarily slow. Our difficulties were first to interest the plumbers as a class, and to convince them that, being held responsible by the public for all sanitary evils of bad plumbing (although the fault might lie with architects, builders, and owners), they should make themselves acquainted with sanitary science and capable of shouldering the responsibility. Ignorance, custom, and necessity are the elements we have had to overcome, but we are succeeding, and begin to show signs of a defined purpose and combined unity of action. First, we have sought to smooth away the angularities arising from unworthy competition among ourselves and to arrange the relations between plumbers and manufacturers on a system more just and permanent. This last was covered by what are known as the Baltimore resolutions, which the National Plumbers' Association has confirmed and all but two or three of the manufacturers have assented to. The resolutions requested manufacturers to discontinue the practice of selling material to consumers, whereby injustice to the plumber and increasing confusion were wrought. The architects and doctors have accepted the situation and will co-operate with any reasonable measures to advance the sanitary welfare of cities. The parties alone are responsible for the plumbing work should also have the planning of it. Correct sanitation includes the construction of boards of health, which, in many cities, seem constituted with the express view to their inefficiency. All of these things require judicious building and sanitary laws defining a standard of ability for the master plumbers. It is upon these points physicians and architects are with us, and we are growing more sanguine of success every year. The meeting at St. Louis, in the number, intelligence, and earnestness of its members, is proof positive, and the reception of our fellow-craftsmen, assisted by the municipal and distinguished servants, backed by the unequivocal and lavish favor of the press, amounted to an ovation. It shows how deep an interest will be taken in any movement to secure public health by improved sanitary regulations when the object and its methods come to be realized more generally. The tone and spirit of the discussions, the learning and earnestness of the essays read, and the high character and superior intelligence displayed by the representatives from all parts of the Union, would do credit to any body of men.—*Sanitary News.*

Death of Mr. Joseph Gosling.

SINCE the last issue of this journal, Mr. Gosling, a well-known practicing architect in San Francisco, has passed away. He was among the early arrivals in this State, and a member of the "Pioneers' Association." During the Virginia City excitement he left San Francisco to join in the general rush of fortune-seekers in that section of country, prior to which he occupied his time as master builder in this city; but finding an opportunity at Virginia City to practice the profession of architect, he did so, and in time returned to San Francisco—twenty years ago, more or less—where he remained and enjoyed a fair degree of professional practice.

San Francisco Chapter.

THE regular meeting of the chapter was held August 7th, President Laver occupying the chair. A goodly representation of the membership were present, all of whom manifested a deep interest in the chapter work. Reports from the various committees were received and acted upon; discussions upon that relating to apprenticeship indentures occupying the greater part of the evening, and after a free and kindly expression of views by all present, the report was referred back to the committee for the purpose of legal advice, and to harmonize the various suggestions made.

Owing to the time occupied in other matters, discussion on the "Lien Law" was deferred until the next meeting of the chapter. The by-laws requiring the nomination of officers to be made in August of each year, either by open nomination, or through a nominating committee, a committee of five, consisting of Messrs. Gash, Macy, Whittemore, Sanders, and Eisen, was appointed, to report at a special meeting to be held Friday evening, 21st inst., to which time the chapter adjourned.

Mechanics' Fair.

THE arrangements that are being made by the management indicate that the coming exposition will be one of more than usual interest. This is to be expected, as the gentlemen in charge have had years of experience and should be in every way qualified to develop many new and specially interesting features—those which go far to win public approval, and make the exhibition a decided success, not only financially but in instruction and profit to the tens of thousands of visitors, old and young, who day and night will throng its broad aisles for pleasure, or to gain the knowledge imparted by the many displays that will be made in beautiful and useful things, and the numerous mechanical contrivances and devices, and the exhibition of art, sculpture, and science in the many forms presented.

LIKE SUNBEAMS.—If you have something to say, as a general rule, boil it down. Words are like sunbeams, the more they are condensed, the deeper they burn.

Our Illustrations.

PLATE 1.—A correct and truthful representation of the Garfield Monument erected in the City Park, San Francisco, sketched from real life by Mr. Oliver Everett, of the architectural firm of Huerne & Everett.

The design has received adverse criticism generally, as being faulty in many of its details, and very far from pleasing in general effect. The poise of the central figure is not good, with the fore part of the right foot projecting over the edge of the cap-stone, and the hands compressing the stomach, suggestive of pain within, rather than a natural and free attitude. The pedestal itself, while fair in proportions, is not striking in any of its features, while the much-too-large female figure resting at its base is, to the common observer, cumbersome, and more an eye-sore than a thing of beauty and appropriateness. The shields at the sides are also objectionable, being more conspicuous than graceful.

It would be more pleasing to express all praise and admiration, but the facts do not justify it. And the original designer being a young San Franciscan, it is to be regretted that he has not won greater and fairer laurels. Still the seeds of promise are to be seen, and, hereafter, Mr. Happensberger may prove himself a foe to be feared in future competitions.

Figure 1, Plate 2.—Original plans of a two-story residence, situated on twenty-first Street, between Mission and Valencia, owned by Mr. John L. Boone, as it appeared before alteration; built by the Real Estate Associates.

Figure 2, Plate 2.—Front elevation of the same after alteration, with corner bay window and tower on new section.

Plates 3 and 4.—Main and second stories after alteration. The tower is to be reached by means of a comfortable ladder piercing the ceiling of the bath-room, thence along a passage way to the front of the building.

Is Our Wood Supply Failing?

AT the recent meeting of the Society of Engineers at Deer Park, Md., a valuable paper was read on the "Preservation of Forests." The paper presented a large number of statistics, collected from various sources, to show the necessity of exercising economy in the use of forest products and the possibility of a wood famine. The writer concluded that the supply of white pine in the United States is certain to be exhausted before the end of this century, and probably in Canada also. Of Southern pine, at the present rate of consumption, there is stated to be 150 years' supply of spruce and hemlock. East of the Mississippi there is probably twenty-five years' supply of hard woods. The supply of black walnut and ash is being rapidly exhausted. The supplies of other kinds of wood are, however, so abundant that a famine cannot be predicted. In reference to tree-planting, the writer stated that when intelligently undertaken in regions where timber is scarce a fair return is made on the investment.—*Exchange.*

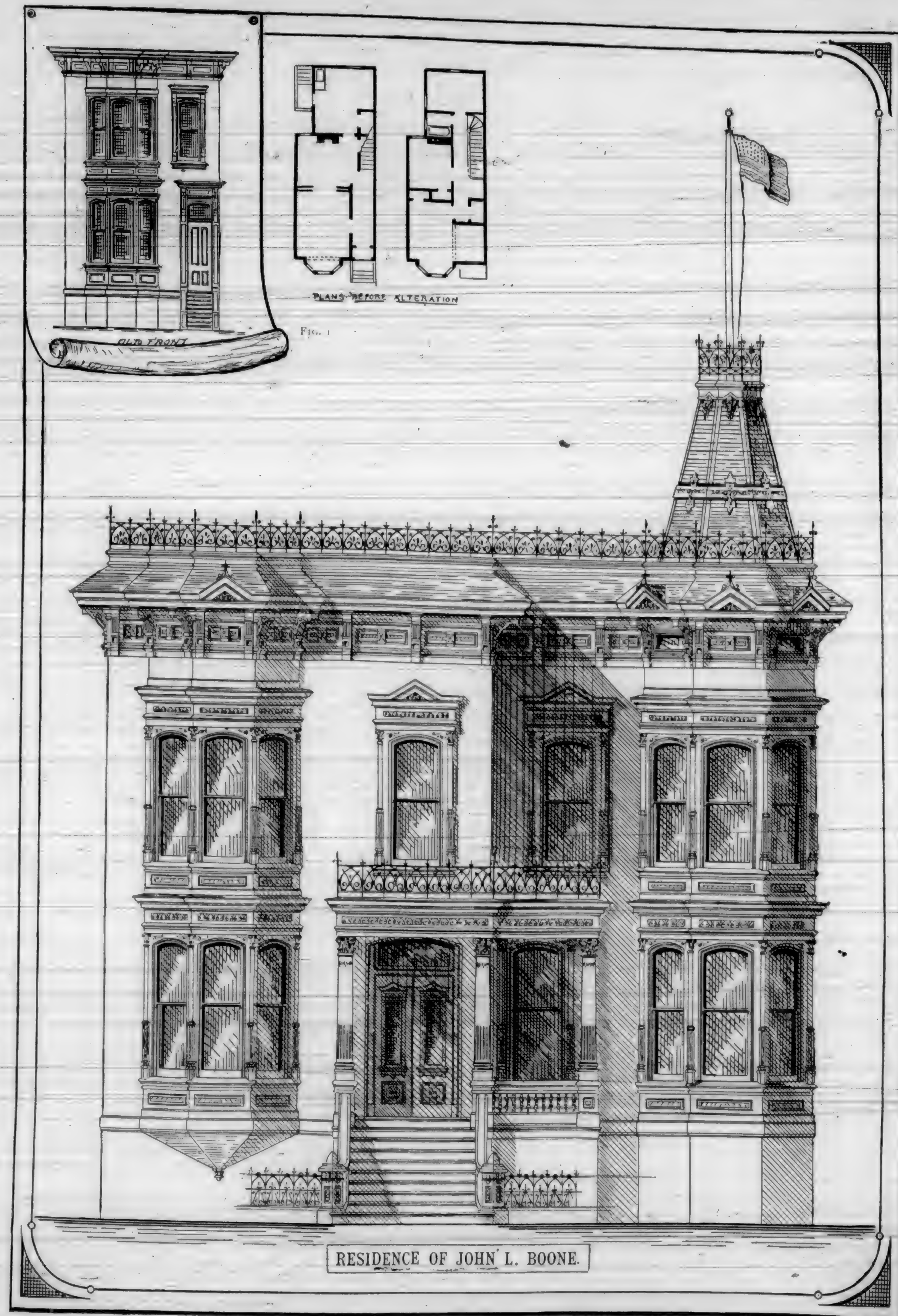


FIG. 2.

PLATE 2.

The Country's Progress.

THE following statistics show the growth of the country since the year 1860:—

Twenty-five years ago we were 30,000,000 of people; now we are over 50,000,000.

Then we had 141 cities and towns of over 8,000 inhabitants, now we have 286 of such cities and towns. Then the total population of our cities was 5,000,000; now it is about 12,000,000.

Our coal mines then produced 14,000,000 tons, now 85,000,000 tons, or six times as much.

The iron product amounted to 900,000 tons of ore; to-day it foots up over 8,000,000 tons a year, almost a nine-fold increase.

In 1860 our metal industries employed about 53,000 hands, consumed \$100,000,000 worth of material, and turned out about \$180,000,000 in annual products.

To-day these same industries employ 300,000 hands, consume \$380,000,000 of material, and their annual product amounts to \$660,000,000 a year.

In 1860 the wood industries employed 130,000 persons; to-day they employ 340,000, while the value of their annual product has trebled.

The woolen industry employed 60,000 persons then, and now employs 160,000, while our home mills, which produced goods of the value of \$80,000,000 in 1860, now turn out an annual product worth \$270,000,000.

Finally there is cotton. In 1860 we imported 227,000,000 yards of cotton goods; in 1881 we only imported 70,000,000 yards.

In the meantime the number of hands employed in American cotton mills has increased to 200,000, and we export over 150,000,000 yards of cotton goods a year, instead of importing 227,000,000 yards as we used to do.

The silk industry employed 5,000 persons, now it employs about 35,000, seven times as many.

We import no more silk goods now than we did in 1860, but our own mills, which produced goods of the value of \$6,000,000 then, now turn out a product of over \$40,000,000 yearly.

In 1860, 12,000 persons were employed in American pottery and stoneware works; to-day about 36,000 are employed in this industry.

The chemical industry, which employed 6,000 persons then, now employs 30,000.

In the meantime we have nearly five times as many miles of railways, and double the number of farms, and yielding more than double the number of bushels of cereals.

In the production of sheep we had 22,000,000 of them in 1860, to-day we have over 40,000,000 of them; and whereas we then produced in this country 60,000,000 pounds of wool, now we produce 240,000,000 pounds.

Finally, the total of our exports has doubled. In 1860 it stood at \$400,000,000, and now it stands at about \$900,000,000.—*Philadelphia Commercial List.*

The City of London.

THIS city was anciently founded on the north side of the river, and down to a time comparatively recent the south bank was not thickly inhabited. As soon as people began to extend beyond the city walls, the phenomena so common in great cities showed itself, and the wealthy moved westward, leaving the poor to extend eastward. Various causes have led to a prodigious increase in the extent of London, and it is now difficult to assign limits to what is almost more a compact province than an extended city. Places that formerly were remote suburban villages have been completely swallowed up, and many outlying districts that are situated outside the metropolitan boundary are really connected with the heart of London by unbroken lines of streets and houses. You may now go from Holloway on the north to Penge on the south, or from Stratford on the east to Putney on the west, without passing an unoccupied field.

It will be easily understood that even the refuse from so large a city constitutes a great difficulty. Much land is now occupied by houses which was once so far out of the way that it was used as a deposit for ashes, dust, and garbage.

London streets, even important ones, are, generally speaking, narrow, and the houses low. In some of the newer districts wide streets have been laid out, and the exigencies of traffic are constantly causing old thoroughfares to be widened and straightened at enormous expense. In many of the oldest parts of London, however, tortuous lanes and narrow alleys, and blind streets abound, and the houses have little or no land in the shape of fore-court or back-yard attached. London enjoys a compensation for her narrow thoroughfares in the number of fine open spaces. The parks have been well called the lungs of London; and, in addition to them, the many squares and the wide channel of the Thames provide a sensible and welcome relief from the crowded and compact mass of dwelling houses.—*Sanitary News.*

Work on the Capitol tower at Albany has made good progress this summer. It has risen thirteen feet, and before cold weather it will reach the point where the cone begins. The first curve of stone for the western staircase has been laid. The electric wires are being carried through all the furnished portions of the edifice, and the legislative rooms are being carpeted anew.

The ten finest buildings in this country, according to the majority vote given in the *Boston American Architect*, are Trinity Church, Boston; the Capitol at Washington; W. K. Vanderbilt's house, Trinity Church, and the Jefferson Market Court House, New York; the City Hall, Hartford; City Hall and State Capitol, Albany; Sever Hall, Cambridge, Mass.; and Town Hall, North Easton, Mass.

The Building Acts in London.

THERE have been building acts in London ever since the period of the great fire, mainly directed to diminishing the risk of another general conflagration. Of the acts now in force, which are numerous, the most important are the metropolis local management act, and the metropolitan building act, with sundry amending acts. The former of these contains, speaking broadly, the regulations as to drains and streets, the latter those affecting buildings. The central authority for drainage, etc., within the ancient and comparatively small limits of the city proper is the city commissioners of sewers, a branch of the corporation. That for the rest of the metropolis proper is the metropolitan board of works—having affiliated to it a series of local boards, each consisting of a group of parishes or a single parish. Beyond the boundaries to which these acts apply there extends a large inhabited zone, forming, so to speak, a third division. Drainage is under the direction of surveyors, who are the salaried officers of the various boards. The building act is administered by a large number of district surveyors, who are architects in practice, and each intrusted with the supervision of the buildings in one locality.

The building act, besides attempting to secure a minimum of strength and solidity in walls, and requiring many precautions against the risk of fire, contains some sanitary regulations of considerable importance and value, though the management act is the one mainly directed to sanitation.—*Sanitary News.*

Evidences are abundant and conclusive in regard to the lasting properties of cypress wood. Hence it is gradually creeping into use more and more each year. Already it is being used in many houses in New York City in finishing, with calls for more. Five million shingles is the estimated amount of consumption in the New York market, with an increasing demand. At least 3,000,000 feet of the wood will be required to supply the market in railroad ties. It is exported to some extent to various ports. Railroad ties have been sent to Cuba, France, and England. Lumber has been sent abroad, but in no great quantities.

The employment of cast-iron columns as main supports has been greatly restricted at Berlin by a regulation issued from the architect's department of the police authorities of that city. The order has been issued in consequence of a discovery made last winter at a fire, when it was found that the cast-iron columns had been cracked by the effect of the cold water playing on them while hot. The authorities now insist that where partition walls rest upon cast-iron columns, the latter are to be covered with plaster or bricked in, with an air space between the bricks and the column.

People who advertise only once in three months forget that most folks cannot remember anything longer than about thirty days.

A Nation's Hero Gone to Rest.

NOTHING that we could possibly indite, would add a single iota to the universal homage paid to the memory of the illustrious dead. It has been the lot of but few men to reach an eminence so high and grand, and secure a love and admiration so devout and universal, as did the honored one who at his death and burial aroused the profound and heartfelt sympathies and sorrow of fifty millions of his own people, and in which millions in other lands united—feeling that a truly great, brave, and good man had passed away.

But while he no longer in person mingles in the active scenes of life, he lives in the memory of present generations, and will live in history through all future ages, as one of the noblest and best of his race; and his examples will pass down through coming periods as a guiding star to millions yet unborn. Truly may it be said, though dead, he yet speaketh.

As in life his influence was powerful, in death it was mighty, serving more than any other one event could do, in breaking down sectional asperities and sentiments, restoring the waste places in our national brotherhood, and uniting the people of our common country in sympathies and purposes never, we trust, to be again interrupted.

National Academy of Designs.

IT is proposed to admit a limited number of leading American architects to the National Academy of Design—a step long since adopted by the British Royal Academy and the French Institute. Several architects are already active members. On this head the *American Architect*, referring to this subject, says: "It is much to be desired that architects and other artists should be brought more together in this country, and every movement for bringing about more intimate relations will be warmly promoted by those who best understand the advantages to be gained in this way. . . . It is true that the simple election of a man as a national academician would not imbue him with artistic feeling, nor secure to him always the co-operation of his brother academicians in his work, but it would do something to interest him in other artists and them in him, while the admission of architectural drawings to the annual exhibitions would do still more; and . . . the mutual acquaintance of persons of tastes so similar could not fail to be in some way pleasant and serviceable to all."—*Ex.*

The manufacture of steel nails has made rapid progress since 1883, in which year this industry may be said to have had its beginning. During the last year there were 393,482 kegs of steel nails manufactured, the production of the three leading nail-making States being as follows: West Virginia, 204,336 kegs; Ohio, 130,636 kegs, and Pennsylvania, 29,224 kegs. In 1883 this country produced only 18,224 kegs of steel nails.—*Mining Herald and Colliery Engineer.*



PLATE 3.

APPROACHING EARTHQUAKES.—The earthquake shocks which were felt recently over a wide area in Yorkshire remind us that an authority on the subject of these phenomena, M. Delaunay, of Paris, is of opinion that next year will see the recurrence of upheavals of the earth's crust in an intensified form. M. Delaunay is a prophet of evil, but unfortunately all his prophecies have hitherto come true. His specialty is earthquakes, and he predicts them only too surely. In 1877 he announced that the year would not conclude without violent disturbances of the earth, and as a matter of fact, two frightful catastrophes on the coasts of South America followed. In 1883 M. Delaunay again pointed to approaching earthquakes, and soon after the volcanic eruptions in the Indian Archipelago occurred, by which thousands of human beings lost their lives, and hundreds of square miles of terra firma were engulfed by the sea. Towards the end of last year M. Delaunay once more raised his warning voice, and the earthquakes in Spain proved how well founded were his warnings. Quite recently he has prophesied very severe volcanic disturbances for 1886. Having acquired a well-merited notoriety in foretelling earthquakes, some weight ought to be attached to M. Delaunay's utterances. He affirms that next year these natural phenomena will be of a very intense character, and that they will show themselves either when the earth is under the direct influence of a planet of the first rank, such as Jupiter, or under that of a group of asteroids, or at a time when the sun and moon are nearest to our planet at the same time.—*Iron.*

Be Thorough.

ONE of the mistakes that young people make oftener than any other, is that of not being thorough, of thinking that it is no matter how a piece of work is done as long as it can be made to serve the purpose. An article in an exchange gives several examples to show how thorough work pays.

It was Carlyle who said, "Genius is an immense capacity for taking trouble," and George Eliot gives us the same thought in other words: "Genius is at first little more than a great capacity for receiving discipline." The most successful have always been the most painstaking. A prominent judge, living near Cincinnati, wishing to have a rough fence built, sent for a carpenter, and said to him:—

"I want this fence mended to keep out the cattle. There are some unplanned boards; use them. It is out of sight from the house, so you need not take time to make it a neat job. I will pay you only a dollar and a half."

However, afterward, the judge, coming to look at the work, found that the boards were planned, and the fence finished with exceeding neatness. Supposing the young man had done it in order to make a costly job of it, he said angrily: "I told you this fence was to be covered with vines. I do not care how it looks."

"I do," said the carpenter.

"How much do you charge?" asked the judge.

"A dollar and a half," said the man, shouldering his tools.

"Why did you spend all that labor on the job, if not for money?"

"For the job, sir."

"Nobody would have seen the poor work on it."

"But I would have known it was there. No; I'll take only the dollar and a half." And he took it and went away.

Ten years afterward the judge had a contract to give for the building of certain magnificent public buildings. There were many applicants among master-builders, but one face attracted his attention. It was the man who had built the fence.

"I knew," said the judge, afterward telling the story, "we should have only good, genuine work from him. I gave him the contract, and it made a rich man of him."

The Hon. Josiah Quincy was at one time conversing with Daniel Webster upon the importance of doing even the smallest thing thoroughly and well, when the great man related an incident concerning a petty insurance case which was brought to him while a young lawyer in Portsmouth. The fee promised was only twenty dollars. Yet, to do his clients full justice, Webster found he must journey to Boston and consult the law library. This involved an expense about the amount of his fee, but after hesitating a little he decided to go to Boston and consult the authorities, let the cost be what it might. He gained the case.

Years after this, Webster was passing through the city of New York. An important insurance case was tried that day, and one of the counsel had been suddenly prostrated by illness. Money was no object, and Webster was asked to name his terms and conduct the case.

"It is preposterous," said he, "to expect me to prepare a legal argument at a few hours' notice."

But when they insisted that he should look at the papers, he consented. It was his old twenty-dollar case over again, and having a remarkable memory, he had all the authorities in his mind, and won the suit. The court knew he had had no time for preparation, and were astonished at the skill with which he handled the case.

"So you see," said Webster, as he concluded, "I was handsomely paid both in fame and money, for that journey to Boston;" and the moral is that good work is rewarded in the end, though, to be sure, one's own self-approval should be enough.

Thoroughness implies attention to details, neatness, and method. A young man who was shrewd and exacting, but whose business habits were careless and unmethodical, succeeded by hard work and economy in establishing a prosperous business, but failed and went into bankruptcy at the early age of thirty-five, because of his carelessness in omitting to put a note for a large amount in his bills payable.—*Western Rural.*

THE GREAT PYRAMID.—Mr. J. B. Bailey writes to the *St. James Gazette* as follows, with reference to the desirability of exploring the great pyramid: "Now that Great Britain is dominant at Cairo, would it not be a good plan to clear away the sand and rubbish from the base of the great pyramid right down to its rocky foundation and try to discover those vast corridors, halls, and temples containing priceless curiosities and treasures with which tradition in all ages has credited the great pyramid? The wonderful building, of such exquisite workmanship, was erected many years before any of the other pyramids, which are only humble imitations, built by another nation, and also for other purposes; for neither King Cheops nor anybody else was ever interred beneath this mighty mass of stone. The smaller pyramids also exhibit neither the nicety of proportion nor the exactness of measurement, both of which characterize the first pyramid. From internal evidence it seems to have been built about the year 2170 B. C., a short time before the birth of Abraham, more than four thousand years ago. This—one of the seven wonders of the world in the days of ancient Greece—is the only one of them all still in existence. The base of this building covers more than thirteen square acres of ground. Its four sides face exactly north, south, east, and west. It is situated in the geographical center of the land surface of the globe. It was originally 485 feet high, and each of its sides measures 762 feet. It is

computed to contain 5,000,000 tons of hewn stone, beautifully fitted together with a mere film of cement. And these immense blocks of stone must have been brought from quarries five hundred miles distant from the site of the building. The present well-known king and queen chambers, with the various passages, might also be thoroughly examined by means of electric or lime lights. The astronomer royal of Scotland, some years since, closely and laboriously examined all that is at present known of the interior of this enormous building. He states that measurements in the chambers, etc., show the exact length of the cubit of the Bible—namely, 25 inches. This cubit was used in the building of Noah's ark, Solomon's Temple, etc. He also maintains that the pyramid shows the distance of the sun from the earth to be 91,840,000 miles.

FIRE-PROOF DOORS.—The most efficient fire-proof doors are of wood covered with tinned iron. The door is made of two thicknesses of tongued and grooved boards, crossing each other diagonally and thoroughly nailed together. The sheets of tin are bent over at the edges, forming locked joints as in a tinned roof; it is important that the edges as well as the sides of the door be covered, as its resistance to heat lies in the fact that the fire cannot burn the wood thus protected against exposure to the air, nor can it warp it, as is the case with an iron fire-door subjected to slight heat. If a fire-proof door is hung on hinges, special care must be taken to insure their security by fastening them to the door by means of bolts rather than screws, and connecting them to the wall in an equally secure manner. The latches should be selected with a view to durability, as such a heavy door is apt to be destructive of weak latches. Where the position of the doorway permits sliding doors, it is preferable to have them on tracks, care being taken that cleats be placed on the floor each side of the doorway, so as to secure the door at its lower corners when shut.

In the Boston Storage Warehouse, United States, there are a large number of such doors in the fire-walls, arranged to close an electric circuit when they are all shut, and the fact is recorded on the paper dial of the watchman's clock at certain intervals. Fire-proof doors are frequently arranged to close in advance of a fire by means of the yielding of an alloy fusible at 160° Fahr. The track upon which such a door is hung inclines about one foot in eight feet, and the door is kept from closing by means of a round stick about one inch in diameter, which reaches from one edge of the door to the opposite side of the door-frame. At the middle the stick is cut in two diagonally, and a ferrule, made of two pieces of thin copper soldered together longitudinally with the fusible alloy, covers the joint in the stick. When this ferrule is exposed to a temperature of 160° Fahr., its yielding causes the ferrule to split open, and the stick separates into pieces and allows the door to shut. In order

that the stick shall not fall in the way of the door, and that the door may be shut at any time, the stick is connected to the top of the door-frame by small chains near to each end. This simple device was designed by Mr. Lewis T. Downes, president of the What Cheer Mutual Insurance Company. Another method of utilizing this fusible alloy to close fire-proof doors and shutters, is by means of a wire extending around the room, and containing in various places links made of two pieces of brass soldered together. When the solder melts and allows the two pieces of brass to separate, the wire allows the shutter or door to close. Mr. Frederick Grinnell has improved the ordinary link by cutting a slot in one of the pieces of brass, and laying a short bit of wire therein, when they are being soldered together; the solder flowing around this wire presents a resistance in three planes, in place of the ordinary joint, which may be imperfect and lies in a single plane, concealed by the sheet brass so as to prevent inspection. Formerly solid links of fusible alloy were used, but the metal has so little resilience that it is apt to gradually lengthen, and finally break at some inopportune time.—*Engineering.*

Preservation of Building Stones.

DR. R. OGDEN DOREMUS, in a paper read before the American Institute of Architects last autumn, said that a result of porosity in building stones is that buildings, after absorbing water, effloresce, or become covered with a coating of salts, especially brick buildings laid in mortar made from sea sand. This means the decomposition of the material, besides a disagreeable appearance. In Philadelphia, after a rain, the houses are generally thus whitened. This efflorescence cannot be prevented by ordinary paint nor oil. Another dangerous result of porosity is that buildings absorb malaria. Hospitals thus become poisoned with a poison so deadly that he remarked he would sooner give his child the most deadly poison in the laboratory, and trust to the antidote, than expose him to such contagion. He mentioned many well-known buildings that were crumbling away, such as Girard College, the College of New York, Trinity Church, New York. He had dined with Goringe soon after the obelisk was set up in Central Park, and the subject of the weathering of the obelisk was suggested. Goringe said that it had stood 4,000 years, and would stand 4,000 years more. But, in fact, the obelisk is crumbling away. He showed several vials full of clippings collected at the foot of it, also specimens of stone found peeled off from inside the new Capitol at Albany.

A simple remedy was suggested, and one which has been extensively applied in St. Louis and to some extent in New York, namely, an application of paraffine mixed with a little creosote. The building is heated by a small furnace, and where there is ornamental work a blowpipe is sometimes required to heat depressions. The paraffine is then applied in a

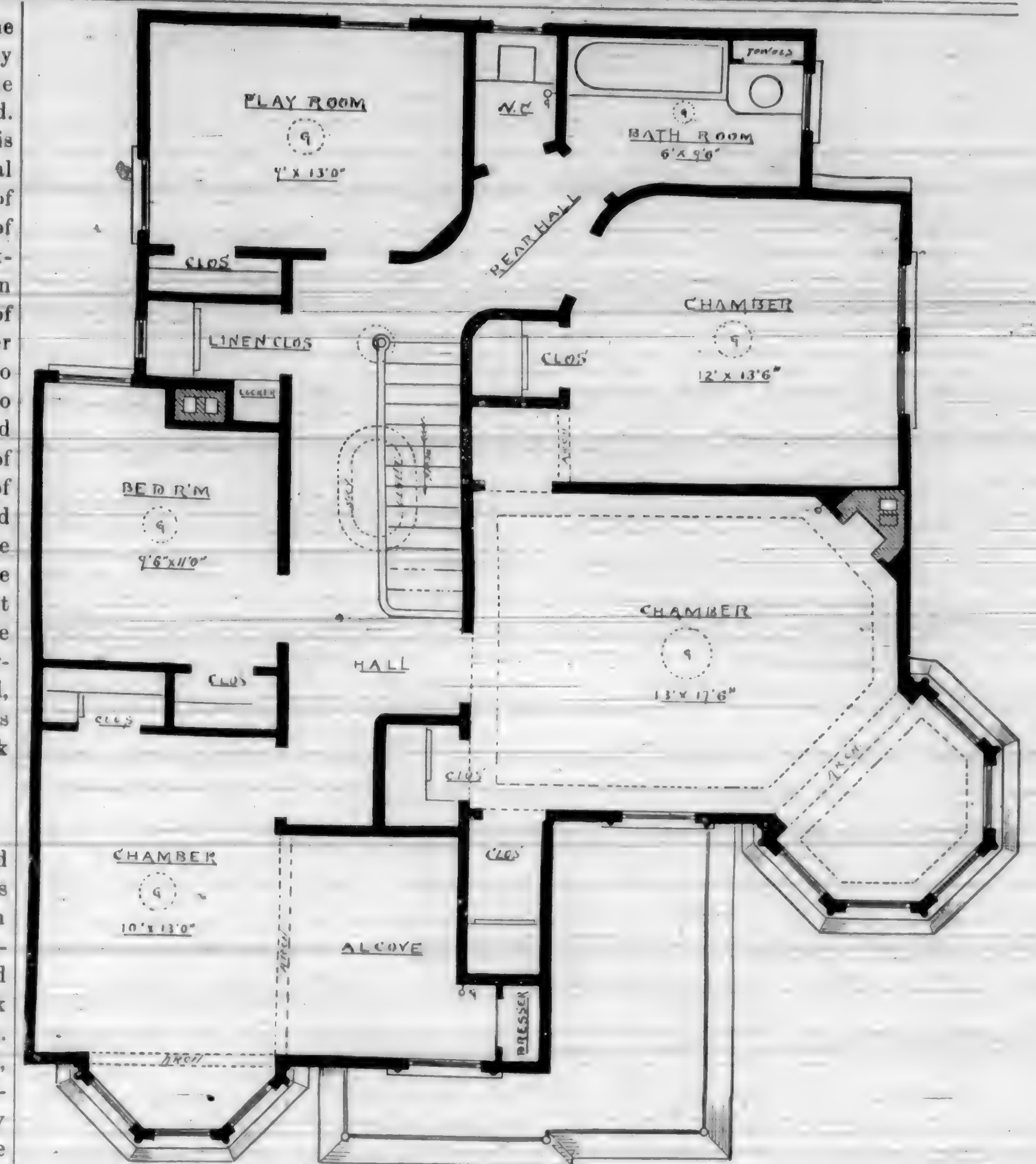


PLATE 4.

melted condition, and sinks in about a quarter of an inch, giving a beautiful and indestructible glossy finish, and rendering the material absolutely waterproof and air-tight. In reply to a question about fire, he said that a fire would only drive it in a little. It costs on an average about fifty cents a yard, and never needs to be applied a second time, as no chemical agent in the air or in the rain affects it at all. Even caustic potash does not unite with it. If the application is made to marble that has been weatherbeaten, the marble should first be cleaned with steel brushes. Marble thus cleaned, however, unless treated with paraffine, soon becomes covered with a yellow stain. Some of the buildings in New York which have been treated with paraffine are St. Mark's Memorial Church; houses 124-6 South Fifth Avenue; Huyler's, corner Eighteenth Street and Irving Place; and a house No. 18 East Fifty-fifth Street, in a brownstone row. Every house in the row except this has its doorsteps "with verdure clad," and the growth of such mosses is destructive to the building material. The paraffine method is confidently commended by Dr. Doremus as the very best ever used.—*Builder.*

TOUGHENING TIMBER.—This is a new process by which it is claimed that whitewood can be made so tough as to require a cold-chisel to split it. This result is reached by steaming the timber and submitting it to end pressure, technically "upsetting" it, thus compressing the cells and fibers into one compact mass. It is the opinion of those who have experimented with the process that wood can be compressed 75 per cent, and that some timber which is now considered unfit for use in such work as carriage building could be made valuable by this means; and more especially since the rapid consumption of our best ash and hickory will sooner or later render some substitute necessary.

A Minneapolis artist, who has been "doing" Alaska, says that all the members of his party, and there were seventy-five of them, agreed that the Greek Church at Sitka is the finest church in America. It is built on the plan of a Greek cross, and the interior is a mass of gold and silver, of a magnificence of which a writer says he can give no idea. The walls are hung with pictures of royalty and the priesthood, sent by a Russian princess, who took this temple under her patronage.

MILL WORK ABUSED IN HANDLING.—This is a thing of common occurrence in the handling and transporting of finishes, doors, blinds, etc. Sometimes damage is done in passing the work out of the mill; such as spauling the arrises and bruising the faces and edges. But the chief source of injury occurs in the loading and unloading, many of the teamsters being of the "baggage-smasher" type, practicing but little consideration for the thing handled, so that it gets on and off the wagon, and the hauling is paid for. Frequently, by the time the mill work, doors and finishes, reaches a building, there are a great many marks, scratches, indentations, and defacements, which often cause trouble and annoyance alike to builder and architect; the former disliking to use the damaged work, which sometimes is of a character that smoothing up and sand-papering will not remedy; but as it is not always the case that the party damaging the work can be found, to fix the responsibility, as "nobody" is always the guilty party, and the contractor, rather than to discard the damaged work, and at extra expense and cost obtain perfect materials, very naturally seeks to use the imperfect, even at some sacrifice of perfect workmanship in the finishes; unless the defects are too glaringly bad, this is a natural result when dollars and cents, and a scrupulous nicety about small things, are the two opposing factors; the former is looked upon and guarded with a more jealous eye, and obtains the benefit of every doubt. If all this can be without noticeable irregularities, and results not discreditably to the architect, nobody is specially harmed; but often such defects are "fixed up" in such a shape that the architect is expected to pass them, at the sacrifice of his own judgment and ambition in the production of perfect workmanship. Ugly issues often spring from the causes outlined, by reason of the architect objecting to defects caused more through carelessness than design, yet of such character as to mar the completeness and perfectness of the workmanship involved; and although the defects may be of no great magnitude in themselves, simply a scratch or a bruise, the effect produced to the technical and practical eye of the architect competent to appreciate the niceties of perfect workmanship, is disagreeable and repulsive, and fully justifies complaint, and a refusal to accept such work.

A SMALL GREASE SPOT OR STAIN

On the dress suit of either a lady or gentleman is a *small matter* in and of itself, still no *tidy* person would willingly appear in public, or in social intercourse, until that *little thing* was removed; because "it spoils the look of the dress." And so in ten thousand other things, "looks"—appearances—produce effects, and judgment more generally follows and is shaped by the impressions made upon the visual organs. If this is so in matters generally, why not in reference to the finishes in buildings, which are continuously in view, either seen or handled every hour of the day, forming one of the permanent surroundings

of the home circle. In this view of the case, an architect cannot be "too particular" and exacting, as upon him rests every responsibility as to the harmonies and niceties which are calculated to make the abode of his client as nearly perfect as possible, all things considered.

TEAMSTERS MOST AT FAULT.

They are often unpardonably careless, dragging and tossing finished work as though it were of but little more importance than a dry goods box or an empty barrel. It is common to see the face casings of window and door panels laid on the iron bound edges of the sides of wagons, and otherwise crossing each other with no attempt at protection from chafing, and thus rode for blocks or miles over rough streets and roadways, with the friction at every step of the horses grinding away the fibers of the wood at the points of contact; so that by the time the place of destiny is reached, the things transported are in parts not fit for use. Not only the same thing occurs with panel doors, but they are often pushed and dragged on and off the load, when laid flatwise, with ungainly indentations made by the ends of the stiles digging into the horizontal parts. All this is bad, should not be, and could easily be avoided by a little care, and with cushions on the sides of the wagons to prevent the friction caused by the iron and wood coming in contact.

Hints on the Care of Tools.

THE following hints on the best means of keeping tools in good condition, which we take from the *Building and Engineering Times*, of London, cannot fail to be useful.

Wooden Parts.—The wooden parts of tools, such as the stocks of planes and handles of chisels, are often made to have a nice appearance by French polishing; but this adds nothing to their durability. A much better plan is to let them soak in linseed oil for a week, and rub them with a cloth for a few minutes every day for a week or two. This produces a beautiful surface, and at the same time exerts a solidifying and preservative action on the wood.

Iron Parts.—Rust preventives.—The following recipes are recommended for preventing rust on iron and steel surfaces:—

1. Caoutchouc oil is said to have proved efficient in preventing rust, and to have been adopted by the German army. It only requires to be spread with a piece of flannel in a very thin layer over the metallic surface, and allowed to dry up. Such a coating will afford security against all atmospheric influences, and will not show any cracks under the microscope after a year's standing. To remove it, the article has simply to be treated with caoutchouc oil again, and washed after 12 to 24 hours.

2. A solution of India rubber in benzine has been used for years as a coating for steel, iron, and lead, and has been found a simple means of keeping them from oxidizing. It can be

easily applied with a brush, and is easily rubbed off. It should be made about the consistency of cream.

3. All steel articles can be perfectly preserved from rust by putting a lump of freshly-burnt lime in the drawer or case in which they are kept. If the things are to be moved (as a gun in its case, for instance), put the lime in a muslin bag. This is especially valuable for specimens of iron when fractured, for in a moderately dry place the lime will not want any renewing for many years, as it is capable of absorbing a large quantity of moisture. Articles in use should be placed in a box nearly filled with thoroughly pulverized slaked lime. Before using them, rub well with a woolen cloth.

4. The following mixture forms an excellent brown coating for protecting iron and steel from rust: Dissolve two parts crystallized iron chloride, two antimony chloride, and one tannin, in four water, and apply with a sponge or rag, and let dry. Then another coat of the paint is applied, and again another, if necessary, until the color becomes as dark as desired. When dry it is washed with water, allowed to dry again, and the surface polished with boiled linseed oil. The antimony chloride must be as nearly neutral as possible.

5. To keep tools from rusting, take $\frac{1}{2}$ ounce camphor, dissolve in 1 pound melted lard; take off the scum and mix in as much fine black lead (graphite) as will give it an iron color. Clean the tools and smear with this mixture. After 24 hours rub clean with a soft linen cloth. The tools will keep clean for months under ordinary circumstances.

6. Put 1 quart fresh slaked lime, $\frac{1}{2}$ pound washing soda, $\frac{1}{2}$ pound soft soap in a bucket; and sufficient water to cover the articles; put in the tools as soon as possible after use, and wipe them up next morning, or let them remain until wanted.

7. Soft soap, with half its weight of pearl-ash, 1 ounce of mixture in about 1 gallon boiling water, is in every-day use in most engineers' shops in the drip-cans used for turning long articles bright in wrought-iron and steel. The work, though constantly moist, does not rust, and bright nuts are immersed in it for days till wanted, and retain their polish.

8. Melt slowly together 6 ounces or 8 ounces lard to 1 ounce resin, stirring till cool; when it is semi-fluid, it is ready for use. If too thick, it may be further let down by coal oil or benzine. Rubbed on bright surfaces ever so thinly it preserves the polish effectually, and may be readily rubbed off.

9. To protect metals from oxidation—polished iron or steel, for instance—the requisite is to exclude air and moisture from the actual metallic surface; wherefore, polished tools are usually kept in wrappings of oil cloth and brown paper; and, thus protected, they will preserve a spotless face for an unlimited time. When these metals come to be of necessity exposed, in being converted to use, it is necessary to protect them by means of some permanent dressing; and boiled linseed oil, which forms a

lasting film of covering as it dries on, is one of the best preservatives, if not the best. But in order to give it body, it should be thickened by the addition of some pigment, and the very best—because the most congenial—of pigments is the ground oxide of the same metal—or, in plain words, rusted iron reduced to an impalpable powder, for the dressing of iron or steel—which thus forms the pigment or red oxide paint.

10. Slake a piece of quick lime with just water enough to cause it to crumble, in a covered pot, and while hot add tallow to it and work into a paste and use this to cover over bright work; it can be easily wiped off.

11. Olmstead's varnish is made by melting 2 ounces resin in 1 pound fresh sweet lard, melting the resin first and then adding the lard and mixing thoroughly. This is applied to the metal, which should be warm if possible, and perfectly cleaned; it is afterwards rubbed off. This has been well proved and tested for many years, and is particularly well suited for polished and Russia iron surfaces, which a slight rust is apt to injure very seriously.

Rust Removers.—1. Cover the metal with sweet oil well rubbed in, and allow to stand for 48 hours; smear with oil applied freely with a feather or piece of cotton wool, after rubbing the steel. Then rub with unslaked lime reduced to as fine a powder as possible.

2. Immerse the article to be cleaned for a few minutes, until all the dirt and rust is taken off, in a strong solution of potassium cyanide, say about $\frac{1}{2}$ ounce in a wine-glassful of water, take it out and clean it with a tooth-brush with some paste composed of potassium cyanide, Castile soap, whiting and water, mixed into a paste of about the consistency of thick cream.

What Mr. Spurgeon said about advertising in one of his recent lectures: "Advertise, for the life of business is printers' ink." He probably, at the time, had in mind the fact that advertising is the staff of life in trade, just as bread is the staff of human life. For if a man wants his name and business to be known, he must keep them before the people. He must let them know where he is, what he is, and what he is doing. What! you doubt if advertising in trade journals does this so effectually as other methods you might mention? Where do you look to find the names of the most successful men you are acquainted with in trade? In the trade papers? Of course. Is your name beside theirs? A commercial man who gets through life persistently ignoring the value of advertising might have his brains exchanged for the stump of a crossing-sweeper's broom, and get along quite as well. Why, when people see a man advertise they know at once he is a business man, and his advertising proclaims that he is not above business, but anxious to do business.

The new building law for the city of New York, which has just been published, proves to be in many respects better and more convenient than that which it supersedes; and

although we are rather disappointed to find that some of the improvements which might have been adopted have not been, the statute, on the whole, marks a decided advance in the official regulation of construction in this country. Among its other merits, the text of the new law embodies many regulations and decisions of the Inspector, which have hitherto formed, so to speak, a part of the common law in regard to building operations, but, not appearing in the official edition of the statute, were only to be learned by architects at the expense of a good deal of trouble and annoyance; and these, particularly the younger ones, will be glad to have at least the greater part of what they are expected to know presented to them in shape for use. One of the principal points of difference between the new and the old law relates to the thickness of brick walls; stone walls, by the way, being entirely ignored in both laws. According to the former statute, no authority could be obtained for building any brick walls less than twelve inches in thickness. The powers of the law seem to have assumed that no New Yorker, however poor, would condescend to live in anything less imposing than a four-story house; and they oblige the builder of a house ten feet high to make all the walls exactly as thick as if it were fifty-five feet high. This provision, by unreasonably increasing the cost of small dwellings, has undoubtedly tended strongly to drive the poorer people of the city into the tenement-houses, which form the reproach of New York; and the new law, very wisely, as we think, modifies the rule so far as to allow houses not more than twenty feet wide, and thirty feet high, to be built with eight-inch walls above the basement, and so that blocks of houses twelve and one-half feet wide, and not over fifty feet high may be built with every alternate party-wall eight inches thick. There is no question that an eight-inch wall, which is, in proportion to its mass, the strongest wall which can be built with bricks, possesses ample strength, if properly built, for carrying the floors and roof of a dwelling house of such modest dimensions; and although the brick-makers may regret the change, hundreds of independent and home-loving workmen will welcome it as bestowing upon them the long-desired privilege of building and owning houses on terms as favorable as those which their brethren in Philadelphia and other cities enjoy.—*American Architect and Building News.*

The strongest wood in the United States according to Prof. Sargent, is that of the nutmeg hickory of the Arkansas region, and the weakest the West Indian birch (*bur seva*). The most elastic is the tamarack, the white or shellbark hickory standing far below it. The least elastic and the lowest in specific gravity is the wood of the *Ficus aurea*. The highest specific gravity, upon which in general depends value as fuel, is attained by the blue-wood of Texas, *Condalia obovata*.

TIMBER IN WASHINGTON TERRITORY.—Some idea of the great wealth of the timbered lands in the western part of Washington Territory may be gleaned from the following report which we take from the Portland, Oregon, *Journal of Commerce*.—

All that portion of Washington Territory lying between the Cascade Range on the east, Coast or Olympic Range on the west, and between the 47th and 49th degrees of north latitude, is a thickly timbered belt of fir, cedar, alder, maple, and other woods. Of these fir probably represents three-fourths. In the midst of this wealth of forest, nature has placed a broad, deep arm of the Pacific Ocean—Puget Sound—with which it is connected by the Strait of Fuca. Thus not only has nature provided the timber, but the water-way also, by which it is possible for the merchant marine of the world to come and obtain their lumber supplies, much of which sometime in the future must be furnished from these forests. Already the lumber trade with Australia, Central and South America, China, and the islands of the Pacific amounts to fully 75,000,000 feet a year, and employs a fleet of about fifteen vessels every month.

Puget Sound is 200 miles long, and has a shore line of 1,800 miles. This irregular shore line forms innumerable harbors splendidly adapted for the erection of saw-mills and other wood-working factories, and also for the establishment of ship yards. Along this whole shore line, and from thence on both sides as far as the eye reaches, nothing can be seen but the vast and magnificent wealth of timber, save here and there where man has established a mill port, a town, or an occasional farm.

In the timber belt of western Washington there are 20,000,000 acres covered with timber, most of which is included within the limits named—an area nearly equal to the combined areas of the states of Connecticut, Massachusetts, Vermont, and New Hampshire. This timber belt will average 25,000 feet of lumber to the acre, or a total of 500,000,000,000 feet of lumber. Hence the saw-mills of Puget Sound, with their present capacity of 500,000,000 feet per year, would take 1,000 years to cut it down. The fir trees frequently attain the height of 250 feet, and planks of lumber are sometimes turned out of these mills 100 feet in length.

There are now erected in this district, as near as we can ascertain, 24 mills, the aggregate value of which is \$5,320,000, with a daily cut of 1,300,000 feet.

In addition to the foregoing statement of the wealth of the mill corporations, very many of them also own sailing vessels and steamers, which are engaged in carrying lumber from the various mill ports to San Francisco and foreign ports. Many of these corporations have agencies in San Francisco, where they own properties in the shape of lumber yards.—*American Engineer.*

The Architects of California.

THE profession upon this coast is numerically large, and in the number there are many most excellent, competent, and honorable gentlemen, as also some who have assumed the practice of the profession without the possession of those essential, architectural, mechanical, and moral qualifications, so necessary to the proper administration of the responsibilities and duties devolving upon qualified architects. But this coast is not an exception in this regard, nor are the lesser class peculiar to the present age. The records of an hundred years ago, and through all periods since then, the complaint of learned and qualified architects in the United States and England, has been the presence, in the profession, of men of exceedingly mediocre attainments, with no higher ambition or aim than the sordid purpose of making money, without any scruples or regard as to the deceit and falsehood that are and must necessarily be practiced by those who have no true merit to recommend them, and who are compelled to rely upon a glib tongue, and wordy commendations of themselves, to entrap unsuspecting clients.

But the purpose of this article is not to dwell upon this class of pretenders, but to suggest a few thoughts to the leading and honorable members of the profession, with whom must emanate, and by whom must be carried into practical execution, the measure necessary to protect the honor and elevate the standard of architectural practices on this coast.

The nucleus for reformatory operations exists in the chapter of architects, which has already accomplished a greater work and influence for good than is accredited by those who have not yielded their personal and apparently selfish notions to a magnanimous acceptance of the possible benefits so manifestly plain, in a united, manly, and earnest commingling as brethren of a highly honorable profession. It may be that some who are not, are the equals of others who are Fellows of the chapter, and who recognize no necessity to become members, feeling confident in their own abilities to conduct their affairs satisfactorily and remuneratively without any assistance. This may be so, but the possessor of great resources is the man who can best afford to be generous. Those who are gifted and learned lose nothing by dispensing to others that which has come to them in abundance. No one lessens his store of knowledge by making others wiser, nor are his individual advantages diminished by an unfolding of facts and principles of life and business calculated to improve and benefit others; and the presumption is fair that, when men who might render assistance in a good cause refuse to do so for reasons not sustained by liberal and generous conclusions, there is a weak point somewhere in their own make-up which might be improved.

But, aside from all this, the architectural profession should be inspired by the high pur-

poses which influence the members of the legal, medical, and other professions to form in society relationships for mutual benefit in the advancement of the respective sciences, and for the protection of their best welfare; to develop methods of improvement among themselves, and scrupulously guard against encroachments and practices of demoralizing character. There is not a true member of the architectural profession who may not accomplish good for himself by aiding in a work of this kind, by mingling with others in advanced movements, and assisting in organizing and maturing measures calculated to better conditions.

It is pleasing to note the good fellowship and kindly professional sentiment which seems to exist among, and permeate the intercourse of architects in many of the States of the Union. The reports of proceedings in numerous cases forcibly illustrate the fact that men with like aims in life's pursuits can lift themselves above all personal bias and prejudices, and all belittling views, and rise to a higher sphere of action, co-operating with one common purpose for mutual interest. Thus it should be, and the more rapid approach to highest possible attainments in architectural science will be the more completely and perfectly accomplished, when this kindly and enlarged feeling and sentiment becomes comparatively universal. It should be so in California, and we need it more from the fact of isolation, and the limited opportunities to gather strength by contact with the advantages enjoyed by architects operating at or in close proximity to the great centers of magnificent structures, and who within a few hours' ride at most, are enabled to pass from city, through country districts, towns and villages, to other cities, gathering new information, ideas, and food for thought and application, and receiving, through the eye and senses, practical suggestions from the thousands of architectural demonstrations presenting themselves at every point. Not so in California. The opportunities are less and circumscribed by local bound; which fact should incite to united and earnest effort in at least seeking to work out the best possible good for the profession as a whole, and in establishing rules and regulations calculated to inspire honorable ambitions and practices, and restraining and correcting, or stamping with disfavor, all individual irregularities, in whatever form they may be found.

A Correspondent of the London "Field"

says: If one wants a carriage or implement photographed so as to make a working copy to scale, all that is necessary is, when the photo is being taken, that a clear and distinct three-foot rule be placed on the carriage; this is photographed along with the carriage, and, no matter what the size of the print or negative, will always be a true scale. It enlarges and diminishes in exactly the same proportion as the carriage.

An Architect's Responsibility.

THIS is a matter about which there are various erroneous notions afloat among the very parties who ought to understand just what responsibility can be properly and justly laid on the shoulders of architects. Probably the most erroneous ideas are those concerning the cost of the work. It is a popular belief that an architect's estimate of the cost of any proposed work is always exceeded by the actual cost, and there is a strong disposition to hold him accountable for this increased cost. It is our opinion, however, that a careful examination of the majority of such cases will show that the extra cost is chargeable to specific demands of the client, based upon the conception that somehow or other he is going to get more for his money than others get; or else from not comprehending the fact that a requirement, which in itself may be inexpensive, often carries in its train extra expenses that foot up to a large total. The client is not, of course, always to blame. We are aware that there is a large class of architects who, for fear of discouraging their clients in the beginning, systematically make all sorts of encouraging responses to inquiries regarding the cost, and doing everything to get a building enterprise embarked for the sake of the fee involved. In considering the responsibility of such architects as these, it must be borne in mind that there are few who descend to false representations in order to gain work, to whom mistakes and blunders can carry any adequate punishment by means of condemnation of their work. After they have secured the work, and it has been executed and paid for, what do they care for any questions of responsibility that may arise? They will find other clients, and their practice may not suffer. They are often successful men, and it is because some of them are frequently taken as typical of the whole race of architects that popular impressions arise that are the reverse of flattering to the profession as a whole.

Let us take such a case as the following: A man makes up his mind to an expenditure of \$10,000, and goes to his architect with his wants really based on that amount, but telling him that the most he can spend is \$8,500. The architect is one of the class we have been considering, and very likely thinks of nothing but producing fine sketches that will catch his client's eye. This he succeeds in doing perfectly, for he is a clever architect when not limited much as to cost. At the last moment, and perhaps because the client himself feels some doubts, the architect is told of the real amount that can be expended, but he is strongly cautioned that this amount cannot under any circumstances be exceeded. The lowest bid comes in about \$11,500, but the client is so in love with the design on which he has set his heart, that he finally decides to go on with it. After the work is under way, various matters crop out that had not been appreciated before, and some things seen only in dim perspective begin to loom up in a very

expensive manner. Of course, the client knew that the heating and mantels were not included, but he was not prepared for sundry other necessities, and he objected to be continually obliged to increase his scale of expenditure throughout. Hence, when he found that the actual cost of the house was \$15,000, he, in his own mind, laid the blame on his architect. In such a case as this the popular judgment is right. The architect is to blame. It is his duty to forewarn his client in the beginning clearly in regard to cost, and if he does not do so, his responsibility is direct. Further than this, if an architect makes misleading statements in order to induce his client to build, we do not see but what he could be held responsible at an action for damages, although it might not be easy to secure the proof unless it was documentary. We do not mean that an architect is bound to state the exact cost. This he cannot do; for even skillful contractors will differ as much as \$2,000 on \$12,000 worth of work. But an architect is certainly in a better position to know the cost than his client; and if his client is evidently expecting too much for his money, it is an architect's duty to inform him of the facts—i. e., that the probabilities are that the cost will exceed the amount appropriated. A little plain speaking on this point at the beginning would relieve an architect of the responsibility for the increased expenditure in case there should be any.

In most cases, however, we think the responsibility for the cost is justly laid at the client's door, the facts being somewhat as follows: The prospective house owner, if he is unacquainted with the building business, fails to realize that when he goes to his architect and says, "I do not wish to spend over \$10,000 under any circumstances whatever," he ought to stop right there if he wishes to hold any one but himself responsible for not exceeding this limit. Suppose the client, after saying as much as this and outlining his general needs as to rooms and peculiarities of living, site, etc., should trust rigidly to the architect for everything else—let the architect determine how much or how little hard wood shall be used, and the scale of the finish throughout. At the same time, let it be understood that the architect is to be held accountable for the result. Is it not a reasonable supposition that the cost would rarely be exceeded? Of course, a sensible architect in such a case would not bind himself down to an exact limit of cost, but if it was understood that his reputation depended upon his success in getting a good thing for the money, we think that the result would in most cases be creditable to architects as estimators. Nowadays there is too much designing without reference to cost. There is far more merit in solving a difficult problem—to build well on a minimum allowance—than to design cleverly, artistically, but, unfortunately, with a total disregard of cost. Any one can design a fairly good thing for \$20,000—we will say; but if the limit was

\$15,000, where is the merit? We are aware, however, that clients do not leave details to their architects. The more usual course for the client is, after the sketches are made, based we will say on \$10,000, to casually mention first one thing and then another, until, by the time the working drawings are completed, a complete category of increased demands not originally contemplated in the sketches, if such a thing were possible, would be astonishing. It is in this way that honestly-estimated sketches lead to increased outlays; and even if an architect is able to point these out to his client, or even if the client has been warned that he is expecting too much, the result is that the architect has to shoulder the blame.—*Building.*

Nuisances Not Due to Plumbing Work.

TWO INSTANCES came to our notice a few days ago which are very good illustrations of the fact which has been often proved, that shortcomings in the household economy are responsible for many complaints of sewer-gas. In the first instance, such complaints were made to a plumber about a house in the best quarter of Jersey City. When he visited it, he was satisfied at once that the odor was not due, as the people in the house supposed, to defects in the plumbing. He suspected dead rats. After a good deal of difficulty, the decaying body of one rat was found between the floor and ceiling; but the odors continued, and it required a week or two of tearing up of floors to get out all the carcasses, some half-dozen, in various stages of decay. But even this did not entirely free the house from the bad smells, and then search was made through the cellar. On a shelf was found a chicken-coop and the filth which would accumulate around such, and when this was removed and the cellar aired, the bad odors disappeared. Yet the family were persuaded at first that their plumbing was bad, and the plumber's reputation would have suffered had he not insisted on a thorough search for the cause of the smells.

In the second case a lady, who prided herself on careful housekeeping and neatness, sent for a plumber in some alarm because bad smells were pervading her house. The plumber informed her at once that it was swill-barrel and not plumbing-work. This was denied; the lady was sure her servants were too well trained to keep a foul garbage-barrel about, but the plumber insisted on looking for the cause, and soon discovered in the rear cellar a barrel with decaying vegetables, which had evidently not been emptied for some time, and had a very "loud" smell. This discovery satisfied the lady. The barrel was removed, the cellar aired, and no more sewer-gas was heard of.

These two cases carry their own moral, now that hot weather is here, and there are many more like them.

Graphite Roofing Paint.

AS FEW of our readers are thoroughly familiar with the nature and properties of graphite, a few general remarks will not be inappropriate before referring to it as a material for roofing paints. Graphite is one of the multitudinous forms in which carbon is found in nearly a pure state. The substance is variously known as graphite, plumbago, and black lead, the last two of which, however, convey the erroneous impression that it is in some way associated with the metal lead. It occurs in nature in different forms, varying from graphite nearly chemically pure to rocks and clays containing a small percentage of the mineral. Its most common use is for pencil leads, for which purpose it is mixed with varying proportions of clay to give the desired hardness. The two most extensive uses to which it is put is in the manufacture of crucibles and similar refractory articles and stove polish. Its peculiar properties are such as to make it an excellent material for roofing paints. Although this use of it has been known for some years, its manufacture is principally confined to one firm, the Joseph Dixon Crucible Company, Jersey City, N. J., who, besides, manufacture graphite for various other purposes.

The method of preparing it for roofing paints, as carried on by the above company, is very simple, and consists essentially in pulverizing the rock containing the graphite, and removing the silica by a leaching process until the remaining compound is suitable for paint. The process is stopped when the product analysis about 70 per cent. graphite and 30 per cent. silica, which proportions are thought to give the best results in roofing paints. This product is next finely ground in boiled linseed oil, in which form as a thick pigment it is put upon the market. The paint when used is thinned with boiled linseed oil until it has the desired consistency, and applied with a brush in the usual manner. Apart from the question of cost, and the fact that, owing to its lesser weight, a pound will cover a larger surface than a similar weight of heavy, mineral paint, graphite has many properties that are said to make it especially valuable as a roofing paint. The spreading properties of graphite are shown in the large surface a small quantity of the pure mineral will cover when rubbed. In virtue of this peculiarity the graphite paint is said to adhere more closely to the metal painted and to fill every small interstice, giving a smooth and perfect surface. Furthermore, the mineral is unaffected by heat or atmospheric changes and resists all corroding influences. The silica is added to give body and hardness to the mixture, and, as it is also unaffected by moisture and heat, it does not lower the quality of the paint. This paint has been used on roofs, bridges, smoke-stacks, etc., and is said to have given excellent satisfaction in all cases.—*Metal Worker.*

Modern Architectural Designs.....\$10.00 Practical Perspective.....\$6.00

PROPOSED DRAINAGE REGULATIONS.—The following excellent regulations have been proposed for the city of Glasgow, Scotland: 1. The positions and sizes of all drains, pipes, cess-pools, or traps, and all soil and rain-water pipes and conductors shall be shown distinctly upon the plans submitted, and the weights per foot of the lead or iron soil-pipes, conductors and cesspools be marked on the plans in figures. 2. Forty-eight hours' notice must be given to the Master of Works, at his office, previous to commencing the laying of any drains. The party giving the notice will receive a card of permission to open the street, which card will be held as proof of the notice having been given. 3. All connection between drains and the public sewer will be made by workmen of the statute labor department, and shall be paid for by the proprietor. 4. Every drain-pipe must have a uniform fall of not less than one inch to every lineal yard, and every pipe must be thoroughly packed and resting entirely on the solid earth. When the Master of Works deems it advisable, he shall require concrete foundations to be put under and around the drain-pipes. 5. The joints must be well cemented and all cement projecting on the inside must be removed. 6. Sufficient traps and ventilation must be provided for and fixed to the satisfaction of the Master of Works. 7. Before covering, all pipes must be inspected by the Master or his representative, and no junction connecting drain-pipes and plumber-work to be covered up until examined and passed by him. 8. The Master of Works to have the power to use the smoke-test on all drains and plumber-work before the building is occupied, and at any other time he may consider necessary, all expenses connected with the test to be paid by the owner of the property. 9. No dwelling shall be occupied until the Master of Works has given a certificate that the drains and cesspools, with traps, have been properly constructed, and the house otherwise fit for occupation. 10. Proprietors and contractors will give every assistance to the Master of Works, for the purpose of performing the necessary inspection.—*American Architect and Building News.*

No place more than San Francisco needs an intelligent, qualified "Master of Works," so named in the article above quoted, with powers to control all irregularities and violations of correct sanitary science and building construction, as defined and established by a commission or board of competent architects and civil and sanitary engineers. The villainous character of seven-tenths of the sewer work done in this city is simply fearful. Not three in ten, if three in twenty, of every foot laid prior to the enforcement of the Plumbing Law, being put in as it should be when entrusted to "sewer layers" upon their own knowledge and honor; nor is the evil fully remedied under the existing law, as the greater portion of the sewer work is still done by those who seldom, if ever, did a good job unless watched at every foot of pipe laid; and men who do well only when they are com-

pelled to, will do badly whenever the opportunity is left to them.

Decay of Iron.

A PHENOMENON has been observed in the Callowhill-Street bridge in Philadelphia, which is of great interest to architects and engineers, although the tax-payers of Philadelphia probably take no satisfaction in it. A few days ago men were sent to repaint the girders of the bridge, and began, as a preliminary process, to scrape off the rust. The attention of the foreman was soon attracted by the unusual size and weight of the scales of rust which fell upon the railroad below, and, on picking some of them up, found that they were solid masses, from one-quarter to three-eighths of an inch in thickness. It is needless to say that plate-iron girders which had lost their substance by rust to such an extent as this would have little strength remaining, and the vibration of the bridge under the movement of a horse-car or loaded cart, which was so great as to compel the painters sitting on their swinging stage to cling to the ropes or the braces of the bridge to avoid being shaken off, indicated still further the necessity for an immediate inspection of the whole structure. The first examination was an informal one, made by persons living in the neighborhood, who found not only that some of the iron-work had been nearly eaten through by rust, but that the whole bridge, which is built on a steep rising grade, had moved down hill so far as to tear out the top courses of stone of the upper abutments, and to buckle the struts of the intermediate supports; while the movements of the roadway framework had cracked the asphalt over them, and forced out the paving-blocks between the horse-railway tracks. The bridge includes one span of three hundred and forty feet, and as there can be no trifling with girders of this length, extensive repairs will probably be necessary. The structure was only completed in 1875, so that ten years of neglect have sufficed to bring it nearly to destruction, and those who have to design important iron roofs or bridges will do well to notice by this example how short is the life of such works if not properly cared for. In the case of the Callowhill-Street bridge, the corrosion was probably hastened by the action of the smoke from the locomotives which passed under it; but there are hundreds of bridges exposed to the same action, and the iron roofs of railway stations and manufactories are often subjected to similar or more dangerous influences.

THE LARGEST APPLE TREE.—The largest apple tree in the country is said to be in the door-yard of Delos Hotchkiss, Cheshire, Conn. Its circumference is thirteen feet and eight inches. The girth of the largest limb is six feet and eight inches. It has eight branches; five bear one year and three the next; 110 bushels have been gathered in one year from the five branches. It is over 140 years old.

Indestructible Paint.

THE Paraffine Paint Company are offering a line of paint compound which is claimed to possess superior qualities, even over the best white lead and oil. It is recommended for a large range of purposes, with extraordinary preservative qualities, and as the best resistant of fire known; also, that it will not chip or peel off, is easily applied, and guaranteed to last twice as long as any other paint. It is strongly endorsed by many of the prominent manufacturing, mechanical, mill, railroad, and other establishments in California.

Commenting on the difference in wages received by plumbers in London and Chicago, a plumbing paper published in London states its belief that the English plumber, by emigrating to the States, will better himself and probably make it better for those whom he leaves behind, by removing his competition from the labor market in England. The reason why this view is held is because wages are so much higher here than in London, and because the plumber here is supposed to have a status in society, that is, expressing it as does the English paper, "they hold a very different position in the States from what they hold at home." As for the latter suggestion, a man's social position in the States does not so much depend upon his occupation, so long as it may be an honest one, as it does upon the character and attainments of the man himself. If he is intelligent and respectable enough to bear the burdens and perform the duties of society, he will receive as much as he is entitled to. He is not hampered by the ridiculous notions of aristocracy; as in England.

As to the question of wages, it is held that the purchasing power of money is greater in London than in the States, but the difference is not equal to the difference in wages. It has been estimated that a man may live one-third cheaper in London than here, but he certainly receives more than one-third higher wages here. The fact seems to be that, in England, the plumber is put upon the same footing as other lines of labor and paid accordingly, while here his labor is recognized as skilled and he is paid accordingly. There is another thing which must be recognized by the intending immigrant plumber. That is, that his trade as learned in England differs materially from the plumber's trade as practiced in the States, and an English plumber just arrived from his native country could hardly hope to receive equal pay with American journeymen.—*Sanitary News.*

One of the simplest and readiest ways of 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 two or three minutes to the head of a rusty screw, will, as soon as it heats the screw, render its withdrawal as easy with the screw-driver as if it were only a recently inserted screw.

MASONS' AND BUILDERS' EXCHANGE OF SAN FRANCISCO.

Room 11, 314 Montgomery St.

BELOW will be found a list of the members composing this Exchange. Boxes are provided for each member, so that architects, owners, or others desiring the services of any particular member, or those having boxes who are not members, and yet whose business is directly connected with that of the Exchange, can readily secure the attendance of the party sought, by leaving a note in the respective boxes.

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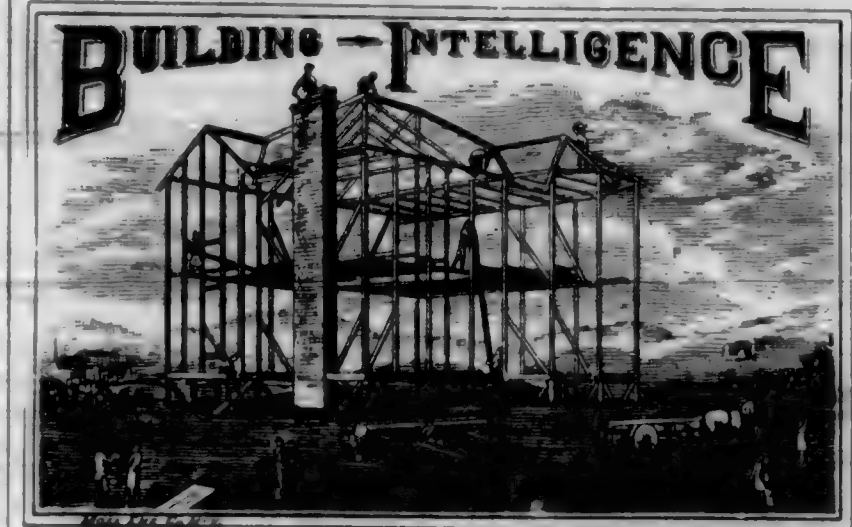
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The minister last Sunday morning had preached a very long, parched sermon on the creation of man, and one little girl in the congregation was utterly worn out. After the services, she said to her mother: "Mamma, were we all made of dust?" "Certainly, my child." "The preacher, too?" "Of course. Why do you think he was not made like the rest of us?" "Oh, because he is so dry, mamma, I don't see how the Creator could make him stick together."



Where owners' names are left blank, it is so done in most instances by special request.

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Adelaide Place, cor. Taylor, Two-story frame.
O. Mrs. Kate Adcock, " 2800.
A. Geo. E. Voelkel, " 2800.
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J
Jones, bet. O'Farrell and Geary, Three-story frame.
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Kissling, nr. Twelfth, Alterations.
O. J. Moore, " 2,000.
Day's work, " 2,000.

L
Lyon, nr. California, One-story frame.
O. Wright & Sanders, " 2,000.
C. and B. D. F. McGraw, " 2,000.

M
Mission Road, Two one-story frames and barn.
O. C. Stagg, " 4,000.
A. T. J. Welch, " 4,000.
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N
Nineteenth, nr. Guerrero, Three two-story frames.
O. Mrs. A. Linscombe, " 25,000.
C. J. Bartlett, " 25,000.

O
Oakland, nr. Twelfth, Two-story frame.
O. H. Kidd, " 25,000.
A. M. J. Welch, " 25,000.
C. A. Klahn, " 25,000.

P
Pacific, nr. Gough, Two-story frame.
O. J. S. Webster, " 25,000.
A. F. Bernard, " 25,000.
C. J. A. Ehmman, " 25,000.

Q
Queen, nr. Steiner, Two-story frame.
O. J. O. Pelton, " 25,000.
C. J. H. McKay, " 25,000.

R
Rialto, nr. Bryant, Two-story frame.
O. Mrs. Ann McBride, " 25,000.
A. J. J. Clark, " 25,000.
C. Wm. Winters, " 25,000.

S
Sutter, bet. Lyon & Baker, One-story frame.
O. P. Owens, " 2,000.
C. Cristy, " 2,000.

T
Tenth, bet. Eighth and Ninth, Two-story frame.
O. T. Angline, " 2,000.
C. P. F. Lynch, " 2,000.

U
Union, bet. Broderick and Baker, Two-story frame.
O. and B. Fr. Metzger, " 2,000.

V
Valencia, nr. Broderick, Two-story frame.
O. J. Owens, " 2,000.
A. Schmidt & Havens, " 2,000.
C. J. Owens, " 2,000.

W
Washington, bet. Octavia and Laguna, Two-story frame.
O. P. Burns, " 2,000.
A. T. J. Welch, " 2,000.
C. Cupps & Green, " 2,000.

X
Xavier, nr. Montgomery Ave., near Jackson, Improvements.
O. J. S. Levy, " 2,000.
A. B. E. Henriksen, " 2,000.
C. P. H. Jackson & Co., " 2,000.

Y
Yerba Buena, Two one-story frames and barn.
O. C. Stagg, " 4,000.
A. T. J. Welch, " 4,000.
C. Stecker & Son, " 4,000.

Z
Zion, nr. Guerrero, Three two-story frames.
O. Mrs. A. Linscombe, " 25,000.
C. J. Bartlett, " 25,000.

AA
Alameda, nr. Twelfth, Two-story frame.
O. H. Kidd, " 25,000.
A. M. J. Welch, " 25,000.
C. A. Klahn, " 25,000.

AB
Abbot, bet. Sixteenth and Seventeenth, Two-story frame.
O. L. Van Lask, " 25,000.
A. H. Gellus, " 25,000.
C. F. Hatt, " 25,000.

AC
Acacia, nr. Thirteenth, One-story frame.
O. Mrs. A. Linscombe, " 25,000.
C. J. Bartlett, " 25,000.

AD
Adams, nr. Twelfth, Two-story frame.
O. H. Kidd, " 25,000.
A. M. J. Welch, " 25,000.
C. A. Klahn, " 25,000.

AE
Adelphi, bet. Fourth and Fifth, Three-story frame.
O. C. H. Ingerson, " 44,000.
A. M. J. Welch, " 44,000.
C. A. N. Nelson, " 44,000.

AF
Africa, cor. Laurel Place, Alterations.
O. A. B. Forbes, " 1,500.
A. W. H. Wharf, " 1,500.

AG
Agriculture, nr. Twentieth, One-story frame.
O. E. Williams, " 1,500.
C. H. J. Van Warner, " 1,500.

AH
Alhambra, bet. Laguna and Octavia, Two-story frame.
O. P. Martin, " 44,000.
C. Wm. Burke, " 44,000.

AI
Albion, nr. Third, Two-story frame.
O. J. Monahan, " 31.
O. J. J. Clark, " 35.
C. J. Adams, " 35.

AJ
Albion, nr. Third, Two-story frame.
O. J. Monahan, " 31.
O. J. J. Clark, " 35.
C. J. Adams, " 35.

AK
Albion, nr. Third, Two-story frame.
O. J. Monahan, " 31.
O. J. J. Clark, " 35.
C. J. Adams, " 35.

AL
Albion, nr. Third, Two-story frame.
O. J. Monahan, " 31.
O. J. J. Clark, " 35.
C. J. Adams, " 35.

AM
Albion, nr. Third, Two-story frame.
O. J. Monahan, " 31.
O. J. J. Clark, " 35.
C. J. Adams, " 35.

AN
Albion, nr. Third, Two-story frame.
O. J. Monahan, " 31.
O. J. J. Clark, " 35.
C. J. Adams, " 35.

AO
Albion, nr. Third, Two-story frame.
O. J. Monahan, " 31.
O. J. J. Clark, " 35.
C. J. Adams, " 35.

AP
Albion, nr. Third, Two-story frame.
O. J. Monahan, " 31.
O. J. J. Clark, " 35.
C. J. Adams, " 35.

AQ
Albion, nr. Third, Two-story frame.
O. J. Monahan, " 31.
O. J. J. Clark, " 35.
C. J. Adams, " 35.

AR
Albion, nr. Third, Two-story frame.
O. J. Monahan, " 31.
O. J. J. Clark, " 35.
C. J. Adams, " 35.

AS
Albion, nr. Third, Two-story frame.
O. J. Monahan, " 31.
O. J. J. Clark, " 35.
C. J. Adams, " 35.

AT
Albion, nr. Third, Two-story frame.
O. J. Monahan, " 31.
O. J. J. Clark, " 35.
C. J. Adams, " 35.

AU
Albion, nr. Third, Two-story frame.
O. J. Monahan, " 31.
O. J. J. Clark, " 35.
C. J. Adams, " 35.

AV
Albion, nr. Third, Two-story frame.
O. J. Monahan, " 31.
O. J. J. Clark, " 35.
C. J. Adams, " 35.

AW
Albion, nr. Third, Two-story frame.
O. J. Monahan, " 31.
O. J. J. Clark, " 35.
C. J. Adams, " 35.

AX
Albion, nr. Third, Two-story frame.
O. J. Monahan, " 31.
O. J. J. Clark, " 35.
C. J. Adams, " 35.

AY
Albion, nr. Third, Two-story frame.
O. J. Monahan, " 31.
O. J. J. Clark, " 35.
C. J. Adams, " 35.

AZ
Albion, nr. Third, Two-story frame.
O. J. Monahan, " 31.
O. J. J. Clark, " 35.
C. J. Adams, " 35.

San Jose Ave., cor. Day.
One-story frame.
O. and B. J. Gillogley.
\$1,800.

Sixteenth, near Market.
Two-story frame.
O. and B. J. Ayer.
\$3,500.

Sixteenth, cor. De Hom.
Two-story frame.
O. Wm. Martin.
C. B. C. Bell.
\$2,700.

Sacramento, nr. Scott.
Two-story frame.
O. Mrs. M. M. Mathews.
C. S. Hatfield.
\$2,800.

Sacramento, cor. Broder-
ick. Two-story frame.
O. B. G. Eldridge.
A. J. C. Pelton.
C. W. H. Wickersham.
\$3,800.

Stockton, cor. Washington.
Four-story brick.
O. W. H. Howard.
A. Percy & Hamilton.
Days' work.
\$25,000.

Stevenson, near Twenty-
first. Two-story frame.
O. T. H. Moore.
A. J. T. Kidd.
C. J. M. Comerford.
\$2,000.

Sacramento, nr. Davis.
Four-story brick.
O. Deming Bros.
C. Geo. Richardson.
\$25,000.

T

Twenty-fourth, nr. San-
chez. One-story frame.
O. J. M. Comerford.
A. J. T. Kidd.
C. J. M. Comerford.
\$2,500.

Twenty-first, bet. Church
and Sanchez. One-story
frame.
O. Capt. Nicholson.
A. Schmidt & Havens.
C. E. W. Rea.
\$2,600.

Tehama, bet. Fifth and
Sixth. Alterations.
O. Mrs. A. Boyle.
A. Wolfe & Son.
C. T. J. Hamilton.
\$700.

Twenty-eighth, corner
Church. Additions. St.
Paul's Church.
O. L. Breslin.
A. T. J. Welsh.
C. Owens Bros.
\$5,000.

Twenty-first, nr. Jessie.
Alterations and additions.
O. John L. Boone.
A. Wolfe & Son.
Day's work.
\$3,500.

Twenty-first, nr. Valen-
tia. Alterations.
O. Mrs. S. Pettit.
C. F. Buckley.
\$1,400.

Treat Ave., bet. Twenty-
fourth and Twenty-fifth St.
Two-story frame.
O. P. Anglin.
C. P. F. Lynch.
\$2,500.

U

Union, cor. Buchanan. One-
story frame.
O. J. Gundlach.
C. Gustave Krone.
\$1,800.

Union, near Hyde. Two-
story frame.
O. Wm. Sloane.
C. Wm. Simon.
\$3,000.

V

Valley, nr. Sanchez. One-
story frame.
O. and B. J. M. Comer-
ford.
\$1,200.

W

Washington, bet. Le v-
enworth and Hyde. Two-
story frame.
O. D. L. Harbach.
A. W. G. Cop land.
C. W. F. Fitzpatrick.
\$4,300.

Waverly Place, corner
Pine. Alterations.
O. Colombo & Co.
C. Kilenger & Cate.
\$2,000.

Webster, bet. Fulton and
Grave. Two-story frame.
O. W. Koch.
A. H. D. Mitchell.
C. Jas. Geary.
\$6,000.

Santa Clara—Alterations. O. Old Mission Church; A.
B. J. Clinch; C. Jas. Binet; \$4,400.

San Jose—One-story frame. O. Sisters Notre Dame; A.
B. J. Clinch; C. Clark & Hutton; \$2,500. Improvements.
O. Jesuit Fathers; A. B. J. Clinch; C. Forderer & Boyle;
\$4,800. Eighth Street—One-story frame. O. Miss J. Ken-
nedy; A. Jacob Lenzen & Son; C. Robt. Smineers; \$1,325.

Park Avenue—One-story frame. O. M. Lenzen; A. Jacob
Lenzen & Son; C. H. C. Stow; \$1,350. Near town. Two-
story frame. O. E. A. Van Dalen; A. T. Lenzen; C. A.
Pickin; \$4,850. Third Street bet. St. Johns and St. James.
O. J. W. Blarer; A. I. Lenzen; C. P. R. Wells; \$4,300.

Park Avenue, nr. Market. O. B. Myers; A. I. Lenzen;
C. A. J. McIlwain; \$3,500.

San Rafael—Two-story frame. O. Mrs. E. Kennedy; A.
B. J. Clinch; C. J. McElroy; \$4,400.

Berkeley—One-story frame. O. Mrs. D. Corrick; A. B.
J. Clinch; C. A. Kocheischwang; \$2,000. Two one-story
frames. O. W. A. Fredericks; A. Schmidt & Havens;
C. J. Parker; \$4,000.

Milpitas—Tanks and tank frames. O. Alms House; A.
Jacob Lenzen & Son; C. E. A. Van Dolen; \$2,000.

Evergreen—Wine Vaults. O. Wm. Burns; A. Jacob
Lenzen & Son; C. J. Carter; \$1,000.

Dixon—One-story frame. O. James Porter; A. N. D.
Goodell; C. Covell & Landrum; \$1,500.

Sacramento—H Street, bet. Eleventh and Twelfth. Alter-
ations. O. James Farria; A. N. D. Goodell; C. Siller
Bros.; \$1,500. F Street, bet. Ninth and Tenth. Two-story
frame school, ten classrooms. O. City of Sacramento; A.
N. D. Goodell; C. Thos. McCaffrey; \$15,000.

San Mateo—Two-story frame. O. A. Hayward; A. Percy
& Hamilton; day's work; \$30,000.

Oakland—Center Street, cor. Eighth. Two-story frame.
O. C. O. Brigham; A. Geo. A. Erdwell; C. F. W. Kern;
\$3,500. Center Street, cor. Eighth. Alterations. O. J.
C. Happe; A. Geo. A. Erdwell; C. F. W. Kern; \$6,500.

Contra Costa—Two-story frame. O. Mrs. J. Gallagher;
A. J. Marquis; day's work; \$4,000.

Temescal—Alterations. O. Jas. Eva; A. J. Marquis;
day's work; \$1,000.

Menlo Park—One-story frame. O. Episcopal Church;
A. J. Marquis; day's work; \$1,000.

Woodland—Two-story frame. O. Milton Enyard; C.
W. H. Winne; \$3,800. Walnut Street. One-story frame.
O. Warren Ford; A. W. H. Carson; C. Glenn & White;
\$3,000. Sixth Street. One-story frame. Woodland Winery
Association; capital for buildings and outfitting; \$15,000.

Main Street. Improvements on Woodland Flaming Mill.
O. and B. S. Caldwell; \$1,000. Main Street. Two-story
frame. Improvements. O. F. W. Brendel; C. Gammel &
Boas; \$1,000. North Street. One-story frame. O. M.
Zirker; \$1,000. Elm Street. Two-story frame mill. O.
and B. Glenn & White; \$4,500. North Street. One-story
frame. O. & B. John Daniels; A. Gilbert & Son; \$1,000.

Capay—One-story frame. O. P. Everett; day's work; \$1,800.

Madison—One-story frame. O. M. Farlen; C. Amesbury
& Davis; \$1,000.

Yolo—One-story frame. O. Henry Kast; C. G. W.
Cooper; \$1,200.

Winters—One-story frame. O. W. J. Cannedy; \$1,000.

EASTLAKE, INDESTRUCTIBLE GLOSS PAINT,

Especially adapted to the climate of California.

Durable, Easy Working, Economical.
MIXED READY FOR USE AS PUT UP.
No turpentine, benzine, gum or rubber. Works as easy as if
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In use in San Jose for three years.

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with THE BEST OF TOOLS
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Superior Workmanship.

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**AND
MACHINISTS'**

TOOLS.

The California Architect and Building News.

VOLUME VI.
NUMBER 9.

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THE
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AND
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nishing,—plumbers' materials, and the Arts and
Trades in harmony with the general charac-
ter of THIS JOURNAL.

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tect, p. 155; Present Taste in Decoration, p. 155;
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B. Exchange, p. 160; Building Intelligence for Sep-
tember, pp. 160-162.

Our Building Reports.

OWING to unexpected interruptions in the
management of this Journal, occurring in
June last, which were not anticipated nor the
contingency to any extent provided for, very
naturally imposed temporary difficulty, which
has required a little time and some effort to
rectify and arrange; and, perhaps, some prac-
tically immaterial inaccuracies in figures in
connection with the building reports, have
occurred. But these being now all overcome,
from this issue and onward, the reports in this
Journal may be relied upon as more nearly
correct than can be found through any other
source. Our annual report and summary will
be prepared with every possible care, so as to
show the transactions for the year as nearly
perfect as unequaled facilities and earnest at-
tention can make them.

Architects, contractors, builders, owners,
and others will confer a great favor by fur-
nishing the editor of this Journal with infor-
mation upon points of error of any character,
in whatever connection found, as we desire to
have every item and every statement appear-
ing in the columns of this Journal, scrupu-
lously correct and reliable.

SUMMARY FOR SEPTEMBER.

118 New Frame Buildings.....	\$509,050
8 " Brick.....	73,550
43 " Alterations.....	163,590
169 buildings.....	\$746,190

These figures show a considerable increase
in building activities over the preceding
month. A careful review for the twelve
months may develop some inaccuracies, and if
so, the necessary corrections will be made.

NOTICE.—The name of this Journal having
been used by parties not in any manner con-
nected with this office, to obtain building in-
telligence and information intended for its
columns, architects, contractors and others
will hereafter please assure themselves before
furnishing same, that the party canvassing is
properly authorized to represent us. Author-
ized canvassers will be supplied with sufficient
evidence upon this point.

When stained glass windows are used in
private houses, it should be remembered that
the effect of the colored glass upon the light
coming through it is to give to it its own tint,
and should this chance to fall upon furniture,
carpet, or wall, whose color, may be, is affected
unpleasantly by that of the window, the re-
sult would be perpetually disagreeable. In
churches, cathedrals, or public buildings,
where colored windows are introduced, it will
be noticed that their surroundings are plain,
generally the stone or marble of the building.

The Present Building Outlook.

THERE is a singular anomaly in the present
aspect of building activities. The general
expressions in commercial and business circles
is, "Times are exceedingly dull," "business is
poor," "aren't clearing expenses," etc., yet the
erection of buildings goes on as lively as might
be expected under the most prosperous and
active condition of general trade and com-
merce, with but little, if any apparent increase
in the number of buildings to let. One year
ago or more, it was generally regarded and
stated that "building was being overdone,"
and that an early grand collapse was inevitable
in this connection; still a monthly addition
has been made since then, of about one hun-
dred houses, representing well-nigh two hun-
dred new places of abode, or homes for families,
many of the contracts reported representing
"flats" of two and three stories, and single
buildings sometimes containing six or more
family apartments. Still the number of un-
occupied houses and tenements has increased
but little, if any, and architects and builders
continue to be busy, with but little signs of
abatement.

Much new work is now in course of prepara-
tion in the offices of the architects, and a good
fall business is assured. The low cost of ma-
terial has and has had much to do with this
state of things; but in addition to this the
"common people,"—small traders, mechanics,
laborers, and wage earners,—have, as a rule, ac-
cumulated and saved money sufficient to en-
able them to secure lots and improve them,
and wisely, very many of them are pursuing
the safer course of investing in real estate,
rather than jeopardizing their earnings by in-
vestments in stocks and uncertain securities.

Notice to Correspondents, Subscribers, and
Patrons of this Journal.

A CHANGE HAVING OCCURRED IN ITS MANAGEMENT, GEO. H.
WOLFE RETIRING.

All Parties in Business Relations, Corre-
spondent, Financial, and Otherwise,

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JAMES E. WOLFE,

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from the publishers, at \$3.00 per copy.

Discussion on the Mechanics' Lien Law.

THE subject of discussion before San Francisco Chapter of Architects at its special meeting held the 14th inst., was the Mechanics' Lien Law of the State of California.

Mr. T. A. Eisen led the discussion, in a review of the several sections of the law as amended at the last session of the Legislature of this State, pointing out its many defects, inconsistencies and illegalities, and showing up its inharmonies with well-known principles of common law, the law of contracts, and the decisions of the Supreme Court of California. Also exposing the private interests sought to be favored, on the part of those who at their own cost and expense employed a well-known "limb of the law" to concoct the amendments as passed, knowing that after passage the cruel thing could not be again amended until the next session of the law making body, and that during that period at least, some personal benefits might be derived, through the cumbersome and in some respects obscure working of the law as it stands, by which advantages may be taken of technicalities, and owners, rather than pay the cost of appeal to the supreme court, may be made to pay monies for which they could not be holden, under a fair and equitable statute, in keeping with the constructions and ethics of law as heretofore announced by the court of last resort, on former appeals. The views expressed by Mr. Eisen were indorsed by all the members present, and for the purpose of more fully considering the subject, its further discussion was continued, to be taken up at subsequent meetings of the chapter.

There cannot be any question as to the palpable illegality of some of the provisions. That compelling the filing of contracts with the county recorder is a violation of personal right, which will be set aside whenever that question is submitted for final decision. A contract is private property, an agreement between the parties of the first and second part, and it cannot be removed and held from the possession of the rightful owner by any process of law. Its recording might possibly be required, but it would be just as reasonable to say that no deed of trust, transfer, conveyance, etc., should be valid, unless filed—stowed away in the safe keeping of the officer of records. And the gentleman who framed that section not only doubted "whether it would stick," but knew that it was an extravagant stretch of legal tactics that would not be sustained when passed upon by the proper tribunal. But aside from this view of the section referred to, it is a most unnecessary provision, serving no good purpose—is impractical, because never availed of—and is troublesome and expensive.

The preposterousness of the proposition is shown by its practical application: for instance, an owner residing in San Francisco determines to erect a building costing over \$1,000, in any county of the State, it may be

the most distant from this center, and there being no planing mills, dealers in building materials, nor competent mechanics in that locality, as a matter of necessity all materials would be forwarded from San Francisco or some other place distant from the improvement contemplated; and the contractor as well must, and naturally would in such cases, be found in this city. So that every party in interest would be in San Francisco. But the law demands that before any work is commenced, or any material furnished, the contract must be filed with the county recorder of the county in which the work is to be executed; and unless so filed before commencement, the contract to become void, and all parties then to have recourse on the owner under the rule of day's work.

Consequently, if a building or other construction is contracted to be built in Sierra County, and the owner does not send the contract beyond his reach for filing in the county recorder's office, of the county named, his contract rights cease. And further, all parties furnishing material, etc., if they desire to examine the original contract which is the pretext upon which the obnoxious amendment is based, must go or send hundreds of miles from the place of his business to see the document, which in all reason should be in the owner's or his agent's possession, and a copy in the possession of the contractor. The concoction is an overreach which fails both in fairness and justice, and is useless to those perpetrating it, except so far as the "little joker" may in some cases prove the winning card, over the right and left bowers of right and justice; and it is questionable whether, while the arrangement holds, and subjects thousands of owners, architects, and contractors to the annoyances and expense of filing contracts, a single one of those who have been instrumental in imposing the hardship, or others in their line, will ever avail themselves of the protection proposed by the amendment.

The delay of thirty-five days after the completion of the building or works for the payment of the twenty-five per cent of contract money held for that period, is another foolish and oppressive provision. The argument that responsible contractors can afford to wait, is fallacious, for experience proves that the penniless scrubs can secure credit from material men which places them practically upon equal footing with the best. Consequently the good and bad can go on just the same, whether the monies of the contract are paid at completion or at any other deferred period; and the objectionable amendment or any other of like character fails to effect the purpose contemplated. But somebody must under the law be all the same kept out of monies due them for thirty-five days. As long as business facilities and favors are extended to the impecunious class of contractors, by material men, planing mills, etc., there will be a way found by them to practically nullify all enactments of character and intent such as that under review.

Science in Architecture.

(Written for this Journal by F. Hillert, architect and mechanical engineer.)

SCIENCE is the interpretation and knowledge of the laws of nature, and the forces governing the same. Man is commanded to investigate and use them for his moral and intellectual welfare, his health and material benefit.

Science has no nationality, but is the collective and aggregate accumulation of the intellectual work of men, both of the past and the present. Its information is extensive, and is found applied in all occupations of men—probably unknown to him—its singular laws governing not one but all of them. The study of the sciences and their investigations cannot be too much recommended.

SCIENCE ON HEAT AS APPLIED IN DOMESTIC ARCHITECTURE.

Heat is a power used for domestic purposes, for mechanical and industrial work. Heat produces work, and work can be converted to heat. Heat must be attached to a medium, and by the abstraction of the same therefrom, work is accomplished.

Heating is the judicious transmitting of heat to fluids or solid bodies; to the air for domestic warming purposes, to the changing of fluids to steam and vapors, to be used at the place of creation for the desired work, or to be conveyed hence to a more convenient place for the abstraction of its work. The necessary heat, therefore, is to be first created by the combustion—a chemical process of uniting the chemical elements of the fuel with oxide—developing heat and light—of fuel on or in a fire-place arranged to collect the heat created, and to admit the atmospheric air required therefor, and the product therefrom, as fire gases by natural or artificial current or draft to be conveyed off, so as not to become obnoxious to men and its surroundings.

The fuel used for home and industrial purposes is in general the wood fiber—a carboniferous hydrate—a combination of carbon with hydrogen and oxygen (H₂O) in the same proportion as in water.

Carbon and hydrogen are the heat-producing elements, oxygen and nitrogen the heat-absorbing elements. The first, therefore, gives the real value to the fuel.

Combustibility of fuel is the greater and smaller capacity by which the same can be ignited and made to continue to burn, requiring therefor a certain high temperature, and is dependent on the condition and composition of the same; fuel being porous and containing a large quantity of hydrogen, has a larger combustibility than fuel, being dense and containing a smaller amount of hydrogen.

The heat developed by the perfect combustion of fuel—the changing of the carbon and the hydrogen contained in it to carbonic acid (CO₂) or water (H₂O)—can be measured in a double relation: by the quantity of heat developed and the degree of temperature (intensity) produced.

Since for heat there is no certain measure

we must be satisfied to give the relative quantity of the same, that is, how much more—quantity—heat is developed from the one fuel than from the other. If the comparative values of heat are referred to the unit of volume, we obtain the specific effect of heat, but when referred to the unit of weight we obtain the absolute heat, or caloric. Both valuations are dependent on the composition of the fuel, the specific heat of the fire gases created by combustion, the outer condition of fuel, its degree of moisture, and the quantity of ashes left as residue.

The heat felt by the sense of feeling and measured by thermometer, does not give the same as quantity.

By actual measurement it has been found by perfect oxidation that

1 unit of weight of carbon heats 8,080 weights of water.
1 unit of weight of hydrogen, 34,462 weights of water.

From 0° (centidegree) to 1°; the comparative figures thus obtained we call "caloric," or units of heat. In the same way the effects of heat are obtained for

Carbon changed to acid of carbon..... 8,080 cal.
Carbon changed to oxide of carbon..... 2,474 "
Carbonic acid to acid of carbon..... 2,413 "
Fire-damp..... 13,063 "
Petroleum (raw), our future fuel, and now extensively used in Russia on the Black Sea and its tributary rivers for navigation purposes..... 11,773 "
Wood, air dry..... 3,600 "
Peat (loose) existing in the tule lands..... 3,000 "
" pressed..... 4,300 "
Coal (mineral)..... 6,000—8,000 "

To give an estimate, how much measurable heat is bound or lost and named "caloric," mix 1 lb of ice with 1 lb of water of 75° temperature, we obtain 2 lbs of water of 0° temperature, 75° of temperature having been consumed by melting of 1 lb of ice.

For hydrogen and its combinations in the fuel, the values given above do not give the exact effect of heat, a portion of the same developed by combustion is lost and used for the evaporation of the water produced; but in consideration that water (H₂O) is composed of 1 atom of hydrogen and 16 atoms (8 molecules) of oxygen, making 9 units of water, and that in CH₂ and C₂H₄ are contained respectively 1/4 and 1-7 of hydrogen—and, further, 600 units of heat are required to change and evaporate 1 unit of water—we obtain the corrected effect of heat, namely:

For hydrogen..... 34,462—9,600=29,062 cal.
For fire-damp..... 13,063—9,460=11,713 "
For olefiant..... 11,358—9,760=11,087 "

And in round numbers for future application:

Oxide of carbon... CO..... 2,400 cal.
Hydrogen gas... H..... 29,062 "
Fire damp..... CH₄..... 11,710 "
Olefiant..... C₂H₄..... 11,090 "
Butelyn..... C₂H₆..... 10,840 "

The results for carbon are obtained from the solid carbon of the charcoal. The combustion of a denser constituted carbon furnishes smaller results: Coal from gas retorts, 8,017 cal.; coal from sugar, 8,040 cal.; natural graphite, 7,844 cal.; graphite from furnaces, 7,785 cal.; diamant, 7,770 cal.

The absolute effect of heat can be calculated by the amount of water evaporated, namely: One unit of weight of water changed to steam of 150° temperature require 652 caloric, hence:

1 unit of solid carbon, giving $\frac{8080}{652} = 12.4$ units of steam.

1 unit of hydrogen, giving $\frac{34462}{652} = 52.9$ "

Chemistry is the science of exact quantities, and uses at her experiments, scales and weights, and when the component elements of the various fuels are known, quantitatively, the effect of heat of the fuel can be calculated from the effects of the components, namely:

Air-dry wood is composed of 0.39 C + O, 40 H₂O, 0.015 ashes and 0.95 water. The effect of heat can be calculated with the assistance of the formula for the effect of heat: 8,000 C + 29,060 H—680 H₂O—600 W. Inserting the quantitative values of the elements we obtain the effect of heat: 8,000. 0.39 + 29,060. 0—680. 0.40—600. 0.15=2,731 cal.

FUEL.	C	H	H ₂ O chemical water.	Hydro-scopedical water.	Ashes.	Effect of Heat.
Air-dry wood.....	0.39	0.01	0.40	0.105	0.015	2,731
Air-dry peat.....	0.35	0.01	0.29	0.25	0.10	2,743
Siluminous coal.....	0.50	0.015	0.205	0.20	0.08	4,176
Mineral coal.....	0.8	0.04	0.09	0.13	0.04	7,433
Charcoal.....	0.8	0.0	0.03	0.16	0.06	7,034
Coke.....	0.8	0.06	0.015	0.15	0.06	7,065

The effect of heat from gaseous fuel, which is more economical, and a better combustion can be obtained—can be found with more certainty—when the component elements are known.

One unit of this gaseous fuel contains: H units of hydrogen, CH₂ of fire-damp, C₂H₄ olefiant, C₂H₆ Butelyn, CO oxide of carbon, CO₂ acid of carbon, N nitrogen. Formulating a formula as above, the effect of heat will be: 29,060 H + 11,170. CH₂ + 11,090 C₂H₄ + 10,840. C₂H₆ + 2,400 CO. And for the different gases:

	H	CH ₂	C ₂ H ₄	C ₂ H ₆	CO	CO ₂	N	Effect of Heat
Of illuminating gas.....	0.05	0.54	0.10	0.08	0.15	0.08	0.08	11,113
Furnace gas from coal.....	0.01	0.04	0.02	0.02	0.22	0.05	0.50	1,509
Furnace gas from charcoal.....	0.01	0.01	0.01	0.01	0.36	0.06	0.63	897
Furnace gas from coke.....	0.01	0.01	0.01	0.01	0.35	0.01	0.64	840
Generator's gas from wood.....	0.01	0.01	0.01	0.01	0.34	0.12	0.63	1,107
Generator's gas from peat.....	0.01	0.01	0.01	0.01	0.22	0.14	0.63	819
Generator's gas from charcoal.....	0.01	0.01	0.01	0.01	0.34	0.01	0.65	816
Generator's gas from coke.....	0.01	0.01	0.01	0.01	0.34	0.01	0.65	816

Since the combustion of fuel is the chemical process of oxidation, taking the oxygen, therefore, from the abundant surrounding atmospheric air, which is a mechanical mixture, or diffusion of 77 parts of nitrogen and 23 parts of oxygen gas; and when the amount of atmospheric air required to burn 1 unit of fuel is 10/3 times larger than the amount of oxygen consumed, and when the amount of the latter can be calculated from the known composition of the fuel, the atomic weight of carbon being 12, of hydrogen 1, of oxygen 16; when, further—1 unit of carbon and 1 unit of hydrogen is used for their change to acid of carbon and to water respectively $\frac{32}{12} = \frac{8}{3}$ and $\frac{8}{2}$ parts of

oxide, than for 1 unit of fuel composed of C units of carbon, H units of free hydrogen, H₂O of chemical water, W units of hygroscopical water, and A units of ashes, we obtain the amount of atmospheric air required by $L = \frac{100}{23} (\frac{8}{3} C + 8 H)$.

To obtain the amount and composition of the fire gases created from the burning of one unit of solid fuel, such as carbonic acid = Ac; units of water Aq; units of nitrogen and A units of ashes we use the formulas:—

Ac = $\frac{1}{3} C$; Aq = 9 H + H₂O + W, and N = L + 1 — A — Ac — Aq.

And for one unit of gaseous fuel, containing, besides nitrogen, H units of hydrogen, CH₂ units of fire-damp, C₂H₄ units of olefiant, C₂H₆ units of Butelyn, CO units of oxide of carbon, and CO₂ units of acid of carbon:—

$L = \frac{100}{23} [8 H + 4 CH_2 + \frac{2}{3} (C_2H_4 + C_2H_6) + \frac{1}{2} CO]$

Ac = $\frac{1}{3} C$; CH₂ + $\frac{2}{3} (C_2H_4 + C_2H_6) + \frac{1}{2} CO$ + CO₂.

Aq = 9H + $\frac{1}{2} C_2H_4 + \frac{1}{2} (C_2H_6 + C_2H_4)$.
N = L + 1 — Ac — Aq.

The atmospheric air required to burn up one unit of solid fuel is generally larger than L and equal up to 2 L and over, and can be set = m L; than will be the quantity of weight of the fire gases created from 1 unit of solid fuel fire gas = (m — 1) L + Ac + Aq + N.

If the mixture of the surplus of air, carbonic acid, nitrogen, and vapors (the moist containing in it) is of such a small quantity as not to bear any considerable effect on the state of condition of the fire gases. To investigate the action and condition of them in the fire channels and the smoke stacks, the density d and the specific heat e of the gas mixture must be known.

The density d of the mixture can be calculated from the density of its compounds; when

(m — 1) L units of surplus air = density = 1.
Ac = carbonic acid = 1.529.
Aq = vapors = 0.623.
N = nitrogen = 0.971.

Then the fire gas mixture will have a density of

$$d = \frac{(m-1)L + Ac + Aq + N}{1.529 + 0.623 + 0.971}$$

The specific heat of the fire gases could as easily be computed from the specific heat of the compounds, if the same, for instance for carbonic acid and vapors, for the different high temperatures would be constant, for they with sufficient correctness for all practical purposes would be set equal to 0.24.

$$e = \frac{0.24 (G = Aq) + 0.18 Aq = 0.24 (1 + \frac{Aq}{G})}{G}$$

With the assistance of the above given formulas and the previous components of the different fuels given, the quantities of air necessary for a perfect combustion of one unit of solid fuel, the quantities and conditions of the fire gases can be computed, and are given in the next following table.

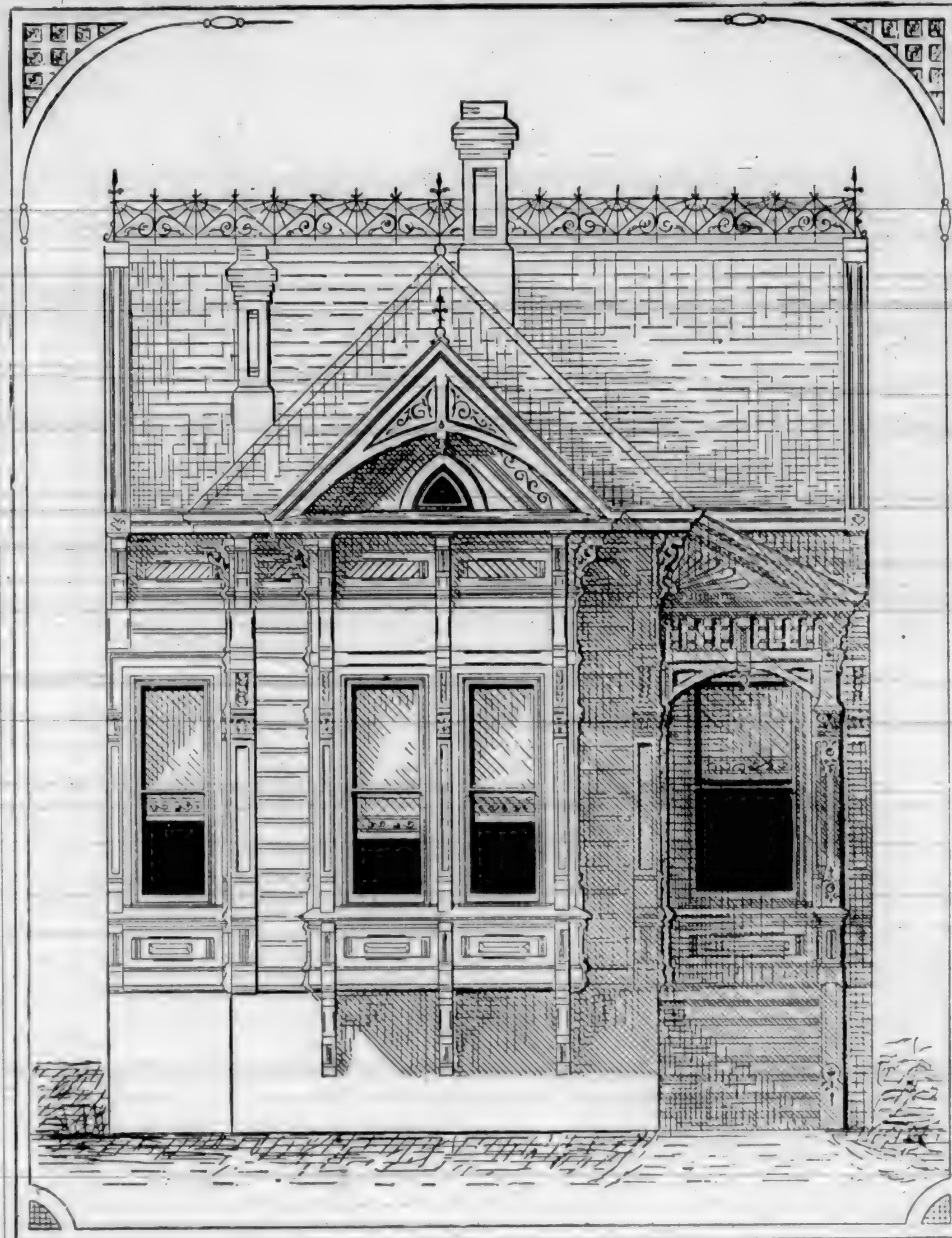
Mineral coal composed of 0.80 C, 0.04 H, 0.09 H₂O, 0.03 W., 0.04 A.

White Lead and Its Substitutes.

THERE has been much written about this leaden subject, and as the metal is of large production, its consumption is increasing in volume, we may venture a few logical suggestions about its manipulation by the corrodors of white lead. In speaking of lead when acted upon chemically, we must speak of the acids as formed and the acetates in many of its compounds. The old Dutch process is now admitted to be the best method of corrodng pure metallic lead, namely: After the lead has been corroded in the form of thin sheets laid over pots containing acetic acid, the carbonated portion of these sheets is separated and ground in a bath of water to free it from acetic acid, and if so done the white lead will be found in the form of a compound of hydrate and carbonate, as one to two as named; and when ground in about twelve per cent of linseed oil, to the proper grade of fineness, it is then run into packages and branded as the pure white lead of commerce. Now, if the foregoing process is not carefully done the result will be too much acetate of lead combined with the carbonate for a free, limpid, working lead. In such cases the lead is found to be lumpy, or drying solidly *en masse*, if kept in store for any lengthy period. The acetate, or sugar of lead, is a good dryer, and for that reason should be all taken out, so that the carbonate and hydrate will form a smooth, soft paste of lead.

The "stencil" mark of pure white lead is a misnomer, as there is no lead in packages but what bears the mark of pure lead. No person can tell whether the lead is pure without the maker's name is attached to certify to the contents. As there are large quantities of these fictitious brands (*no name*) sold in our markets, the buyers should beware of pure white lead that has only a brand to recommend it. The intentional impurities of white lead are very numerous. The Kremnitz White, or Flake White, are among the purest found in any market. In Europe there is the Venice, which is composed half and half, one part sulphate baryta and one of white lead. Then there is the Hamburg White, which has only one-third pure white lead, and the remainder is made up of sulphate of baryta. The Dutch White is only its inferior by having only one-fourth white lead and three-fourths, by weight, of sulphate of baryta. What is this baryta? It is only one of the simple earths, called by Bergman *terra ponderosa*, or heavy spar. The mineral is reduced by a chemical process to a heavy white powder, not very opaque in body, and hence its employment in adulterating white leads which have great body or covering qualities. What has been said of those foreign brands is largely improved upon in the United States, for they beat the Dutch so bad that there is scarcely left a trace of white lead in some of the fancy brands which read "25 lbs. Pure White Lead."

The competition between manufacturers is so great, with large trade influences, that vast



ELEVATION ONE-STORY COTTAGE.—PLATE 1.

quantities of inferior brands of white lead are sold at so low a rate that the better brands of pure white lead, which sell for a slight advance in price, are limited in sale to the better class of painters. This is the true state of the case. While we have lead mines all over the Western States by the thousand, capable of producing millions of tons of pure ore, our American white lead manufacturers import cargoes of baryta and make up fraudulent brands of pure white lead and continue to impose upon a long-suffering public for the almighty dollar. One of the consequences of this system of manufacture has led to the birth and growth of a twin evil to the trade, and that is the making of ready-mixed paints, canned goods in all colors of dope, hermetically sealed in tin, good in any climate. In most cases these infallible mixtures are free from pure lead, being adulterated with the heavy-weighted baryta, not to improve their color or purity, but to give

bulk and weight and less in quality. There are hundreds of factories in the United States that have their own peculiar mixtures, all warranted to be superior to any other, in having fine color and a durable gloss that will outwear any other brand of mixed paint. Thus it will be seen, that to afford capital an opportunity to make its investments profitable the substitutes must have their day. But the trade, house, sign and carriage painters, must educate the young apprentice to know what pure white lead will do, and the technical uses of pure pigments of every grade, and thus protect the trade from these abuses.

J. E. W. C.

Builders' Guide.....	\$ 2.00
Album of Mantels.....	8.00
History of Architecture.....	15.00
Building Superintendence.....	3.00
American Cottage Homes.....	3.00
Village and Country Homes.....	5.00

Architectural Competitions.

IF there is anything connected with the practice of architecture more fruitful of corruption and scandal than competitions we have yet to discover it. A recent sensation is reported from El Paso, Texas, where there was a competition a year ago for a Court House and jail, to which twenty-five architects, so-called, responded. One came in person all the way from Chicago only to see the prize captured by a San Antonio rival. After the usual difficulties with competition, drawings, making changes, supplying omissions, etc., the work was let somewhat informally for the sum of \$135,000. The jail was finished last March, and the Court House was ostensibly progressing properly when a disagreement with a subcontractor led to charges before the grand jury and to a series of ineffectual attempts to secure an investigation, which has compromised the standing of a judge and other county officials, and produced great excitement among the taxpayers. Indignation meetings have been held, funds subscribed to force an inquiry, and the commissioners who had repeatedly evaded the charges were compelled to give them a hearing.—*The Inland Architect and Builder.*

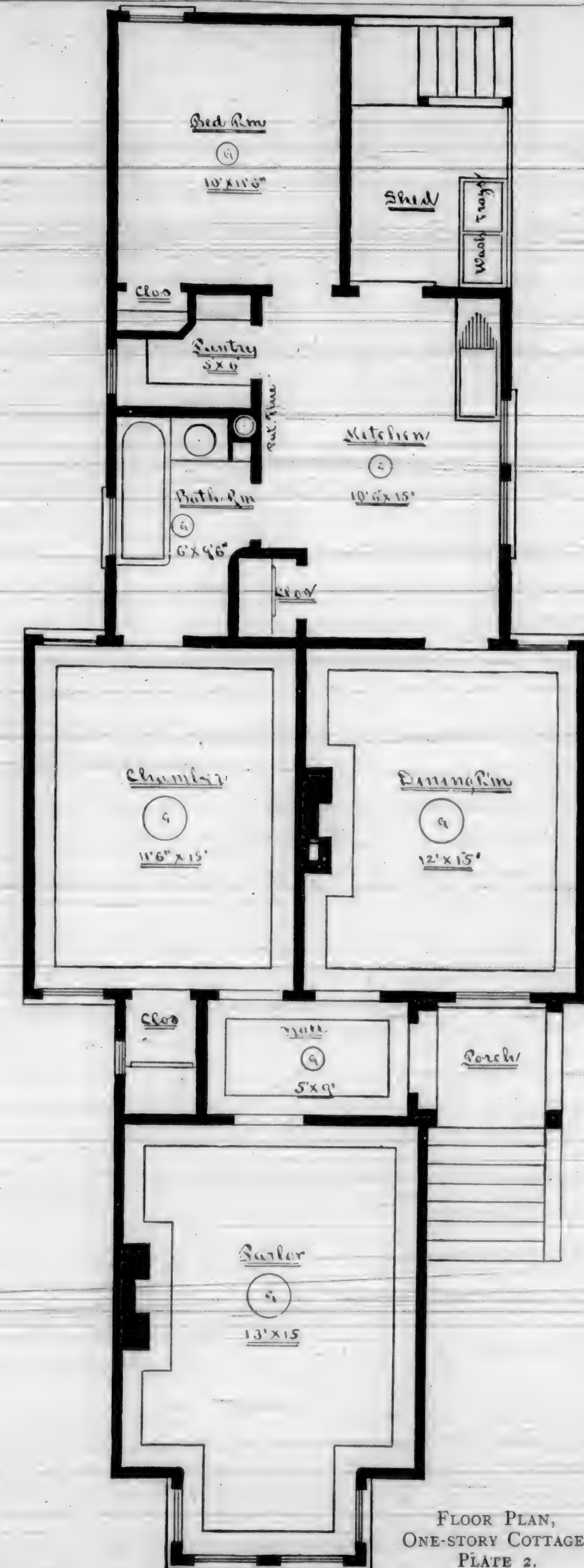
Our Illustrations.

CUTS Nos. 3 and 4, a moderate cost cottage for country, with a total of nine rooms, bath-room, halls, closets, pantries, etc., as shown by the plans. It can be built for about \$3,500, according to the economies practiced.

Cuts Nos. 1 and 2, elevation and plan of one-story cottage with five rooms, bath-room, closets, etc., can be built at a cost of \$2,000 and upward. The space above ceiling of main story will permit the making of four loft rooms, by placing suitable windows in the respective gables.

Queer Origin of Words.

THE word "pamphlet" is derived from the name of a Greek authoress, Pamphylia, who compiled a history of the world into 35 little books. "Punch and Judy" is a contraction from Pontius and Judas. It is a relic of an old "miracle play," in which the actors were Pontius Pilate and Judas Iscariot. "Bigot" is from Visigotha, in which the fierce and intolerant Arianism of the Visigoth conquerors of Spain is handed down to infamy. "Humbug" is from Hamburg; "a piece of Hamburg news" was in Germany a proverbial expression of false political rumors. "Gauze" derives its name from Gaza, where it was first made. "Tabby cat" is all unconscious that her name is derived from Atab, a famous street in Bagdad, inhabited by the manufacturers of silken stuffs called atabi or taffety, the wavy markings of the watered silks resembling pussy's coat. "Old Scratch" is the demon Skratzi, who still survives in the superstitions of northern Europe. "Old Nick" is none other than Niker, the dangerous water demon of Scandinavian legend. The lemon takes its name from the city of Lima.

FLOOR PLAN,
ONE-STORY COTTAGE.
PLATE 2.

Knights of Pythias in San Francisco—Their Prospective New Castle Hall.

A PUBLIC meeting of the members of the order was held in B. B. Hall, Eddy Street, August 31, for the purpose of enlisting a more general interest on the part of the members in the movement now on foot to raise, by sale of capital stock of the Hall Association, the necessary funds to begin at an early day the erection of a

NEW CASTLE HALL.

Large and commodious, and in every way suited to the wants and necessities of the order, not only as providing lodge rooms for the valiant knights in San Francisco, but a grand headquarters—a home where the membership universal on this coast, personally and collectively, may repair and enjoy all the benefits and advantages to be derived from fraternal intercourse and fellowship.

The lot is an eligible one, fronting 77 feet along the northerly side of McAllister Street, opposite the Hall of Records, by a depth of 137 feet 6 inches. It has increased in value a hundred per cent. during the past few years, and the property in time will rank among the most valuable in the city, off from the great main streets, which will forever command and hold pre-eminence.

An incorporate Hall Association has been organized, composed of intelligent, capable, and honorable members of the order, who are working hard to set in practical operation, measures calculated to consummate the desired end. The capital stock of the Association is fixed at \$100,000, divided into ten thousand shares of the par value of \$10 each. The lodges in San Francisco have already taken well on to \$20,000 worth of the stock, which sum will be materially increased from the same sources as necessity requires. The enterprise is one that should not and will not be allowed to fail of success, as it presents many inducements to both lodges, as such, and individual members personally, to become shareholders.

AS AN ORDER MOVEMENT.

With a view to securing and owning meeting-rooms for its lodges and associating therewith in the shape of a grand assembly hall, library, chess room, drill room, and all the modern conveniences and comforts known in connection with buildings of this character, it commends itself to most favorable consideration; and.

AS A BUSINESS PROPOSITION.

It is an investment that should meet a hearty response from every member of the order, as its incomes and profits are assured from its inception, by rental from lodges under Pythian jurisdiction, in addition to large prospective receipts from its grand assembly hall, from organizations other than Knights of Pythias, and other incomes that have crowned the successes of other orders less numerous in membership, who have secured to themselves buildings of their own.



ELEVATION COUNTRY COTTAGE.—PLATE 3.

An interesting review of prospective cost and income was given by P. C., T. F. Bachelor, who was followed by G. C., Geo. B. Katzenstein, P. G. C., John H. Harney and W. H. Bodfish, and by P. C., A. K. Stevens, James Patterson, F. H. Farrar, Dr. N. J. Bird, and others. The assemblage was not numerically as great as was hoped for, but this was made up by the hearty enthusiasm and interest manifested by those present, and the individual subscriptions to the capital stock.

The importance of the matter being more than local, it is expected that every lodge of the order within the jurisdiction, and every member who can afford it, will aid the enterprise by becoming shareholders.

Building Report—Woodland, Yolo County.

DURING the past three months, mechanics generally have been well employed, and material dealers fairly busy, the only drawback experience being a scarcity of coin, as three-fourths of the building business is conducted here on a cash basis. The prosperities have been such that no one should feel discouraged should there be less work done during the remaining months of the year. Still there are a number of first-class buildings and improvements on the prospective state, for early commencement, and good reasons to anticipate a good ending and showing for 1885.

The list of building improvements of all classes for the third quarter of the year is as follows:—

CITY OF WOODLAND.	
35 Frame buildings, value.....	\$102,000
3 Alterations and repairs, value.....	3,000
38 buildings.....	\$105,000
YOLO COUNTY.	
16 Frame buildings, value.....	\$30,875

4 Brick buildings, value.....	25,000
20 buildings.....	\$55,875
A total for the third quarter of 1885, of.....	\$160,875
Corresponding periods in 1884, 29 buildings and improvements of the value of.....	97,400

Gain for 1885 over 1884 of.....\$63,475

In the preparation and prosecution of the figuring, the services of architects are fully up to, if not greater than any previous time, thus demonstrating the fact that our people intend to build wisely and well, observing true and correct taste and principles. Many of the cities and towns in this State are noted for the good judgment, refinement, and æsthetic taste displayed by owners, architecturally and otherwise, in the improvement of their property—a most commendable ambition, which should be practiced in all cases. Good judgment should never be influenced by bad examples, nor inconsistencies and incongruities accepted and duplicated, because other have so far erred as to practice abominations in the name of architectural science. Architecture is susceptible of almost endless treatment and variation, and any community of people may beautify their surroundings, by the exercise of good judgment, and the adoption of styles in buildings calculated to incite and inspire sentiments of admiration. In this view of the case, all artisans and mechanics should be careful in the style and character of the work presented by them for public criticism, so that it may reflect credit and prove worthy of imitation by others. GILBERT & SON.

Woodland, Sept. 5, 1885.

Plaster, How to Make It.....	\$1.00
Shavings and Saw-dust.....	1.50
Lumberman's Hand-Book.....	2.00
Practical Geometry.....	1.00
Architects' Companion.....	2.50

Crowded Out—Exchanges—Future Enlargement.

THE quantity of original matter appearing in present issue, has crowded out a number of valuable articles from the columns of several of our highly-esteemed, and ably edited and conducted exchanges. To meet this condition of things, and provide for the utilization of the vast volume of interesting matter received monthly, through the piles of Eastern and foreign contemporaries, arrangements are being perfected by which this journal,

IN JANUARY, 1886, WILL BE GREATLY ENLARGED AND IMPROVED.

Giving much greater space for both reading matter and advertisements. A number of able and intelligent, scientific and mechanical writers and correspondents will be added to its staff editorial, and nothing that personal devotion and means can accomplish, will be left undone, to place it still higher in public esteem and confidence, and render it a journal of still greater reputation and merit. To this end, we ask the hearty co-operation of every present patron and subscriber, in assisting to

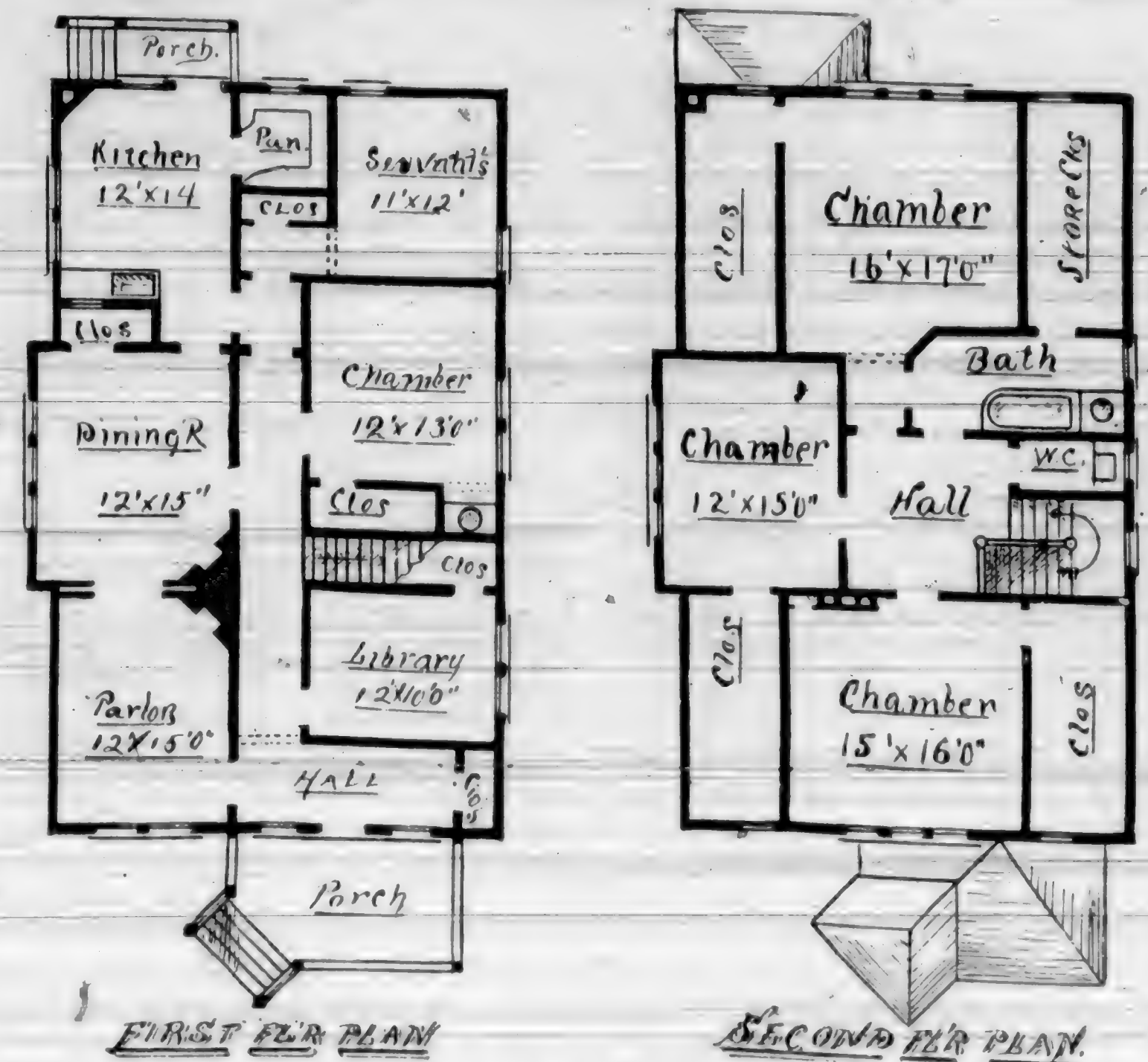
INCREASE ITS SUBSCRIPTION LIST.

Every new, and renewed subscription gives encouragement; encouragement stimulates ambition; ambition, effort; and well-directed, intelligent effort never fails of accomplishing the end and purpose aimed at.

THE BLACK DIAMOND.—The first number of the first volume of a new monthly journal, bearing the above title, is before us, edited by T. I. Jervis and H. A. Bischoff, with C. W. Collins as manager. It is published in Chicago. Very neat, clear, and readable in typographical execution, and its columns well filled with matter interesting to the general reader, as well as to those specially interested in the coal interests, to which it is particularly devoted. We bid it good speed and prosperity, and welcome it to our already plethora exchange list, and hope the number of its subscribers on the Pacific Coast may be large. Our hand, brothers, hoping that while the base of the interest you represent is black, smutty, and not to be handled with white kid gloves, your success may ever be bright and cheerful, and never smoky, even though you may have to replenish the fires of your ambition with earnest effort.

A verdict has recently been given by an English jury, which is of considerable interest. The tenant of a house in Croydon brought an action against his landlord for damages resulting from the death of his wife, from diseases caused, he claimed, by defects in the drainage and plumbing. The lady had possessed an income of \$5,000 a year, which "died with her," and for this substantial loss the husband asked compensation.

He showed that he had rented the house on representations of the landlord that it was in perfect sanitary condition, and that its plumbing and drainage had been done under the



FIRST AND SECOND FLOOR PLAN OF COUNTRY COTTAGE.—PLATE 4.

supervision of the Croydon Local Authority. But the state of the house was bad, sewer-gas escaped from the joints of the soil-pipe and from a broken trap, and a drain in the rear of the house was stopped. Before the death of the wife, the cook, the gardener, and the stepson of the plaintiff were ill. The landlord showed that he had reason to believe at the time that his representations about the condition of the house were true, as the local authority of Croydon had inspected the house, which was a new one, and had not found fault with any arrangements. But the jury, nevertheless, found for the plaintiff, awarding him \$10,000 for the damages sustained in the loss of his wife, and \$1,140 additional for expenses which he had incurred by reason of the insanitary arrangements.

In a circular issued by the Board of Health of Bridgeport, Conn., the following directions about diet and cleanliness in cholera seasons are given:—"As regards special precautions against cholera, great care should be used in the matter of food and drink. Wholesome meats and vegetables, and ripe fruits, may be used freely; in fact the free use of acids in fruit or otherwise is supposed to act as a preventive. But under no circumstances should any decayed or stale vegetables, unripe fruit, or tainted meat be allowed to be sold or used. The liability of water in the wells to become polluted by the contents of sewers and vaults, even if placed at a distance from them, should forbid the use of well-water for drinking purposes in all thickly settled places. Indeed,

during a time of threatened cholera no water should be drunk until it has first been boiled to destroy germs. It may afterwards be cooled by placing in contact with ice, but not by the addition of ice. Milk should be boiled before using for the same reason. The use of cathartic medicines should be entirely avoided except under the advice of a physician."—Sanitary Engineer.

In no part of economy are we divorced from wire. It is our slave, and an ever-present master. Sleeping, we repose on wire mattresses. Eating, we see food which has passed through sieves, and which is sheltered from insect appetite by wire covers. Calling, we pull wires to ring curled wire gongs. Traveling, we are conveyed by cable or electric railways, hoisted by elevators hung on wires and hurried over wire bridges. We announce our coming by telegraph or telephone wires, and we tread our way by night through streets lighted by means of electric cables. Across our fields are strung thousands of miles of barbed wire. Our clocks are set by wires, our watches run by wires, our books are stitched by wires, our pictures hung by wires, and our politics managed by wires. Forty years ago there was not a telegraph office in existence. To-day they number over 60,000. Ten years ago the telephone was not in existence. To-day there are 330,000 in use in the United States alone.—Electrical Review.

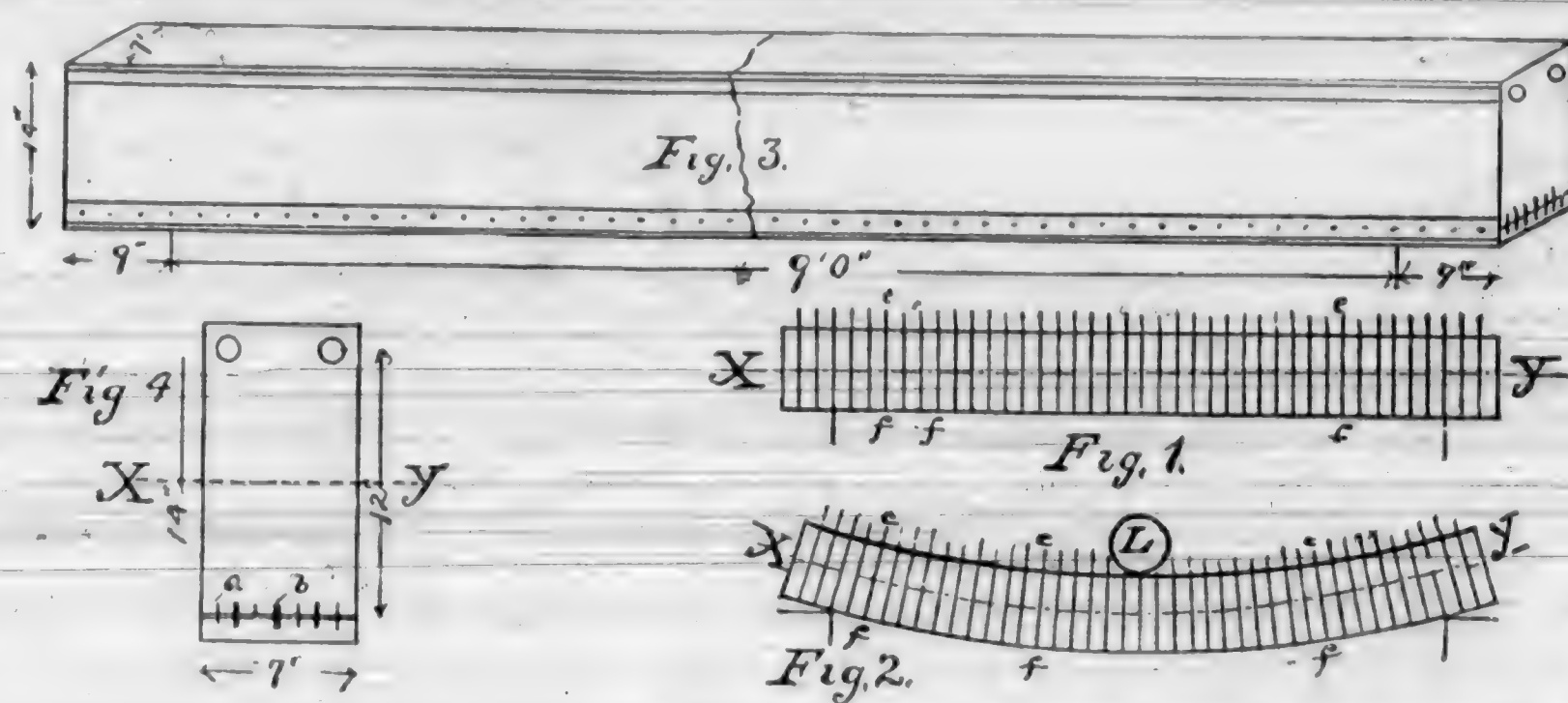
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Concrete.

AN interesting experiment was made on the 31st of August in the presence of several architects and scientific gentlemen at the Industrial Iron Works, No. 233 Beale Street, by Mr. P.H. Jackson, to demonstrate the strength of a Portland cement-concrete beam combined with iron of a kind invented by Mr. Thaddeus Hyatt and largely experimented on in London, in 1876. One of the objects of the invention is that they may be used in part as beams or girders to support sidewalks, floors of buildings, as well as walls, etc. The advantage claimed by the construction is that the sidewalk, floor, or wall aids in its own support, in furnishing all the compressive resistance requisite in the part usual above the neutral axis of a beam. The concrete-combined-with-iron part of the beam is cemented to the bottom part of the wall or sidewalk to be sustained, and is required to furnish only the tensile strength, or that part of a beam below the neutral axis.

These concrete beams or girders are straight and are made of Portland cement and gravel, and with a small quantity of iron or steel bars built on the bottom of the concrete body, sufficient to resist the tensile strain due to the load, the sidewalk or wall to be supported to which it is cemented, furnishing the remaining part of the beam or girder above the neutral axis in resisting compressive force. These bars may be of any shape with their surfaces roughened, corrugated, serrated, or other than a regular surface to hold on to the surrounding cement and prevent its slipping or sliding when under strain. Trials have proved that smooth bars with their ends fastened pulled through. These bars may be either singly or in combination; the latter are threaded to each other by $\frac{1}{4}$ -inch round rods, the width of the beam, passing through their centers, which stiffens the structure in its width. Also the concrete beam may be separately employed in resisting compression as well as tension, performing the entire function common to all beams. One of this kind was the subject of the trial. In this case the iron or steel ties furnish the tensile strength to that part of the Portland cement-concrete which is comparatively very weak in resisting tension below the neutral axis, to balance the strong compressive-resisting property of this material above the neutral axis. In General Gilmore's work on the strength of artificial stone he found by experiment that a mixture of 1 volume of Portland cement to 2 volumes of sand the ratio of the crushing to the tensile strength will generally be found between the limits of 14 to 1 and 19 to 1. With cement 1 and sand 4 it reaches as high as 25 to 1 and 29 to 1. With cement 1 and sand 5, as high as 35 to 1.

An explanation of the forces exerted on a single beam is as follows: When a straight beam or girder is subjected to a bending stress, it becomes more or less curved, by virtue of which the lower part is lengthened and the



upper part shortened in proportion to the depth of the beam and the difference in length between the radii of the curves. Were the beam made of horizontal layers the effect of the stress would be to cause these to slide one upon the other, but the beam being solid, the particles are held together by their own cohesion, the shearing strains being thus opposed by the cohesive force. The primary strains in the beam on the lines of compression and extension being upon curved lines, the disturbed particles must of necessity tend to arrange themselves in harmony with the radial lines of circles, all below the neutral axis seeking extension and all above compression. An illustration referring to figure 1 represents the side view of a straight beam or structure to be subjected to transverse strain when loaded and resting on end supports, the line $x y$ representing the neutral axis when loaded, being the dividing line between where the compression force ceases and the tensile strain begins, the greatest force and strain being at the extremes from the neutral axis. The imaginary vertical lines are at right angles with the bottom of the beam. The distance from any two of the lines at the top from e to e is the same as from f to f at the bottom. The length of the beam at top and bottom is equal.

Figure 2 represents figure 1 subjected to severe bending stress curved by the load L , which has caused great deflection. The vertical imaginary lines e, f figure 1 have become radial lines in figure 2, radiating from a center to the curve of the bottom of the beam. The distance from f to f at the bottom of the beam in figure 2 is greater than in figure 1, the thrust force causing the disturbed particles to extend the greatest at the bottom, and gradually diminishing up to the neutral axis where it ceases, and from there the compressive force begins and gradually increases till the top surface is reached, which is the greatest, and the distance from e to e has shortened, the neutral axis line $x y$, being the original length of the beam, providing the two opposite forces have been equal in resistance. It is evident that when the beam is loaded and the imaginary lines e, f are held in their vertical position and not become radial lines, there can be no deflection of the beam, and its integrity remains intact. Mr. Hyatt, knowing

the great compressive-resisting strength of Portland cement, and the great disparity in its comparative feeble tensile resistance, united iron or steel in such a way as to bind them to the weak part of the concrete body, in resisting separation along the bottom of the beam or structure, so as to furnish all the tensile strength needed below the neutral axis to balance the great compressive resistance above the neutral axis. The beam in question tested at the Industrial Iron Works, had iron longitudinal bars connected together by small cross rods and in the manner that the places of juncture would be at equal distances as represented by the vertical lines at f, f , as in figure 1, which in this instance was 3 inches centers as shown by the dots at the bottom of figure 3. These cross-rod were $\frac{1}{4}$ -inch diameter as shown in figure 4, representing them passing through the 7 vertical bars, thereby holding the concrete to the beam every 3 inches in the manner of the vertical line at f, f , figure 1.

Referring to figure 3 is a longitudinal view of the beam tested. Figure 4 is a cross section, 7 inches wide, 14 inches deep, 10 feet 6 inches long. Distance between supports, 9 feet, $x y$ representing the neutral axes. At $\frac{1}{4}$ inch up from the bottom was built in 3 of $\frac{1}{4} \times 1$ inch and 4 $\frac{1}{4} \times 1$ inch wrought bars, extending the length of the beam, and at every 3 inches $\frac{1}{4}$ inch round iron rods extended through these 7 bars, some as shown in cross section figure 4 and longitudinally as in figure 3. The total weight of the wrought iron was but 46 $\frac{1}{2}$ pounds; this resisted the tensile strains until the beam was broken. The area of cross sections of these wrought iron ties to resist the tensile strain of the beam, after deducting the holes for the $\frac{1}{4}$ inch rods, is less than a bar of wrought iron 1 inch square, or the bottom flange of a wrought iron beam 8 inches wide by $\frac{1}{4}$ inch thick.

Without due consideration, Mr. Jackson informs me, larger pieces of cast iron, as shown in figure 3 near its top, were used than the necessity of the case required to make up in compressive resistance what the beam above the neutral axis might be deficient in, hence are larger than required. These were 2 of $\frac{1}{4}$ -inch diameter cast iron rope mouldings built in near the top, weighed 36 pounds; the compressive resistance of cast iron is 93,000

pounds per square inch. The beam was five months old.

The load was of pig iron, piled uniformly over the length of the beam, ending in a line over the inside of the supports.

When laid on	deflection 1-16 in.
15 $\frac{1}{2}$ tons 30,989 lbs.	3-32 "
18 " 33,589 "	1/8 "
19 " 35,703 "	1/4 "
20 " 36,045 "	3/8 "
21 " 38,113 "	9-32 "
22 " 40,956 "	1/2 "
23 " 42,062 "	5/8 "
24 " 44,077 "	1 "
25 " 45,678 "	1-1/8 "
26 " 46,115 "	1-1/4 "
27 " 47,018 "	1-1/2 "
28 " 47,996 "	1-3/4 "
29 " 49,001 "	2 "
30 " 50,054 "	2-1/4 "
31 " 52,062 "	2-1/2 "
32 " 52,692 "	2-3/4 "
33 " 53,654 "	3 "

The pig iron was closely piled, and was 7 feet 6 inches above the beam.

The broken beam is now in front of 231 First Street. The gentlemen present exhibited great interest in the great strength of the construction, and when it is considered that this construction is called upon to act a part of half a beam, when supporting brick or cement work, the part to be supported acting in one-half of its own support, the invention may prove of great value.

The great strength of this beam, being but 7 inches wide, and considering the compressive resistance of the cast iron acting relatively to the wrought bars below, makes the distance in height but 12 inches. (See figure 3.) Therefore, computing the strength of this compared to a wrought-iron beam, of an area of bottom flange equally the area of all the ties in the concrete beam, we have as the breaking distributed load:—

$$\frac{1 \text{ in. area of bottom } 12 \times 180}{9 \times 12} = \frac{17.8}{10} \text{ gross tons.}$$

Or 19 $\frac{9}{10}$ net tons. Excess of this concrete combined with iron beam over a wrought iron beam computed by the formula is 7 tons, or above one-third. This may be attributed to the solidity of the Hyatt beam compared to the web of a wrought iron beam, which is subject to lateral deflection, also from the punched rivet holes weakening the iron, and from what other causes is a subject for consideration.

Symmetry of line came in place of the extravagant contours which had prevailed, resulting in an inspiring transformation, the influence of which has been felt in all succeeding times. Even now, with the many combinations of styles in this most fruitful period of art, the Louis XVI. style receives in furniture, architectural woodwork and mural decoration very full recognition. There is an abundance of detail in present styles of ornamentation, more probably than at any former period, but there are abundant evidences that so far as simplicity of general aspect can be combined with rich and graceful elegance, designers, guided in part by advanced public tastes, will not be found wanting.—*Exchange.*

The Architect.

Of all professional men the architect should have the broadest and deepest knowledge—that is if we are to judge by the standards of the past.

Pythius, in his commentaries, the oldest work on architecture that we have any record of, says "that an architect should have that perfect knowledge of each art and science which is not even acquired by the professors of any one in particular."

Vitruvius tells us that an architect "should be a good writer, a skillful draughtsman, versed in geometry and optics, expert at figures, acquainted with history, informed on the principles of natural and moral philosophy, somewhat of a musician, not ignorant of the sciences both of law and physic," etc.

The great Hindu authority, "The Maushyalaya Chandica," gives it as a law that "an architect should be conversant in all sciences; ever attentive to his avocation; of an unblemished character."

One thing is true, that all those who intend to follow architecture as a profession should pass through some solid and rational system of instruction—drawing, geometry, motives, materials, and the machinal skill necessary to use them; "a philosophical study of the history of architecture in its relation to various phases of civilization," the causes of its development or decline, etc. The moral side should also be taught—more particularly the personal responsibility of the architect. Unless something of this kind is done we cannot hope to have able and skillful architects.—*Art and Decoration.*

In Chicago, the cry of the people for open spaces and parks has not become so intensified as it is in London, or even in New York. Yet there is pending an action in the city council which threatens to hasten the time when this cry will be bitter enough. The lake-front park is a magnificent open space, directly facing the lake in what will soon be the busiest section of the city. An effort is being made to secure the opening of streets in this park, and an ordinance is ordered drawn up for the purpose. This is but the entering wedge which it is expected will secure this valuable land for commercial purposes. It is a great mistake. The commercial interests of Chicago should be made to pay something for the hygienic influence which the preservation of this park will exert in the future.—*The Sanitary News.*

The ancient city Smyrna, now called Ismir, the only city on the western coast of Asia Minor, which has prospered, commercially, from the time of its foundation by Alexander the Great to the present, has always been defective in sewerage. Through an oversight of its architect, no provision was made for sewers, and the effects were so pronounced fifteen hundred years ago that Strabo speaks of them in his writings. The city has always been the seat of pestilence and plague.

Present Taste in Decoration.

The general abandonment of wainscoting is all in favor of a more effective display of furniture. The beautifully patterned styles of wall paper now supplied ordinarily in subdued tones and neutral tints, with no one color unduly predominating, make, when judiciously chosen, a more effective background than one partly of wood and partly of paper. This and the fact that wainscoting is a sort of walling up, has driven it out.

The selection of the tone and pattern of paper may be properly made with reference to the intended hue and tone of the furniture and of the carpet. No arbitrary rules can be laid down in this matter. A general harmony, however, is quite consistent with strong contrasts, only these contrasts demand greater art to manage than closely analogous colors. In carpets, for instance, we now see admirable patterns in which a light field is traversed by bright and dark bands; so also in upholstery textile coverings of chairs, sofas, lounges, and fauteuils. The truth is that improved taste has set in against tameness; more inspiring effects than mere neutral colors themselves will yield are looked for. Hence the abundance of gilded and colored metal ornaments in all sorts of quaint forms, which it is now the fashion to introduce, brilliant coloring extends even to lamp-shades, in some of which mosaic colored glass is introduced; in others, opalescent hues.—*Art and Decoration.*

The competition for the new Chamber of Commerce in Cincinnati, which has just been decided, presents several points of interest. Its general character, the high reputation of the architects invited to compete, the universal excellence of the designs submitted, and the final decision of the committee, all mark it as a great advance on methods formerly in vogue in competitions for public work. In issuing their invitations, the real estate committee of the Chamber of Commerce, composed of gentlemen of unimpeachable integrity and standing, selected six representative architects, whom they offered to pay about what sketches necessary for a fair presentation of designs for the building would cost. The original circular from the committee reserved for them the rights, first to retain as their property all plans presented, and second, to pay the successful architect \$2,000, and employ another man to make working drawings and complete the building. These two clauses the committee, in response to strong representations from Mr. Richardson, and Burnham & Root, finally modified, specially agreeing to return all plans except the one premiated, to use no features peculiar to any one of these designs, and virtually conceding that the architect presenting the accepted design should be chosen to finish the drawings and superintend the building.—*The Inland Architect and Builder.*

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