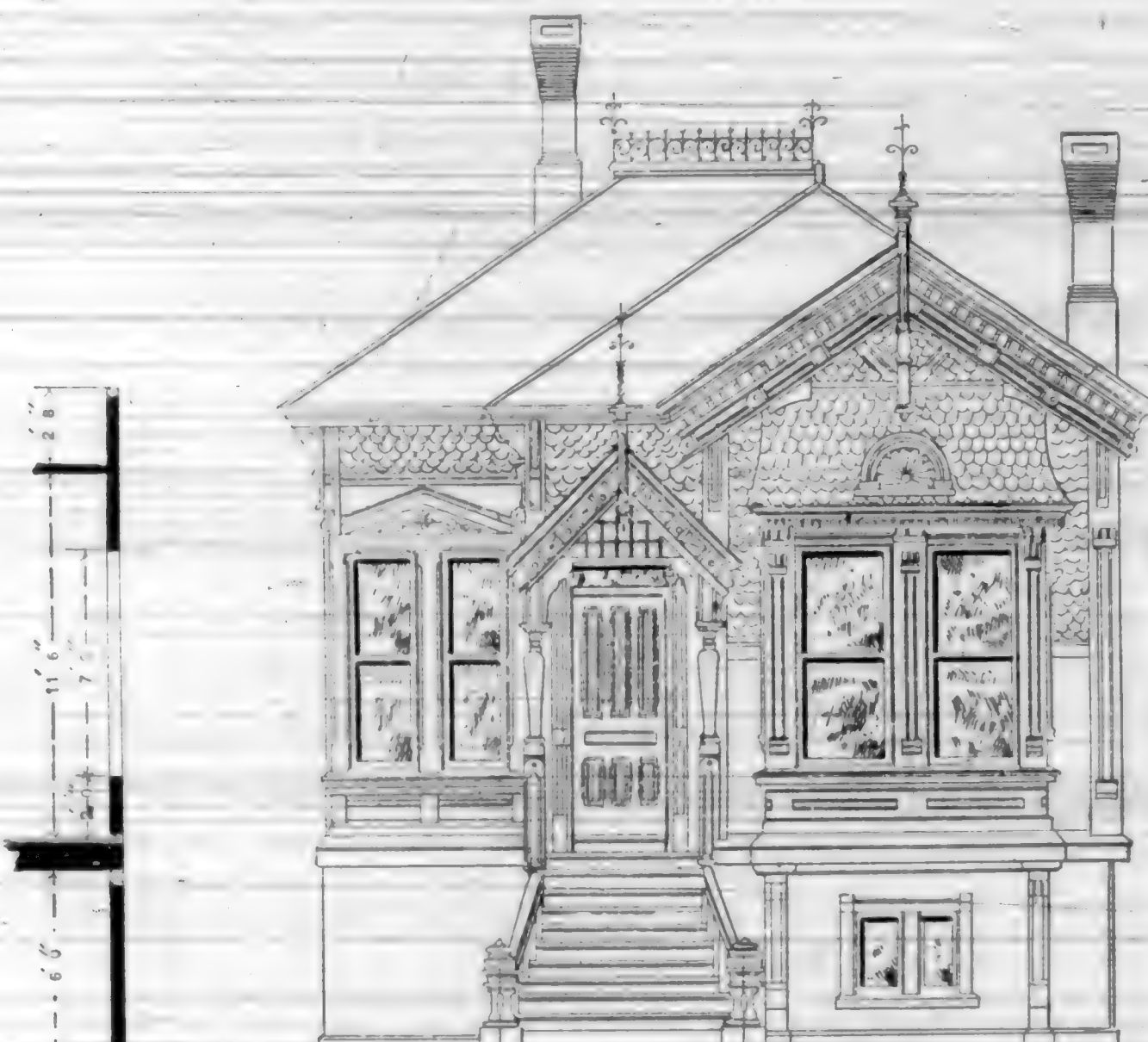
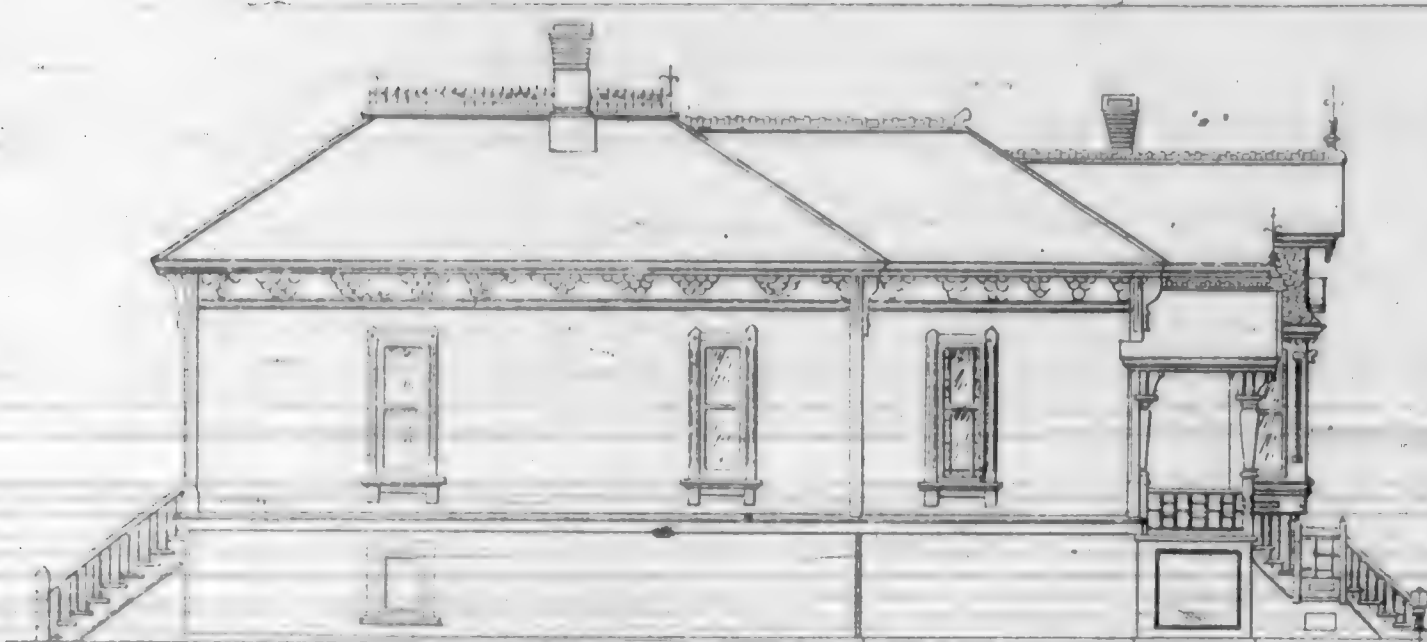




"PRECITA." Front and Side Elevation of Suburban Cottage.

Photography in the Draughting Room.

H. T. BESTOR.
No. 1.

THE time is not far distant when every well appointed architectural draughting room will have a full apparatus and facilities for the reproduction of drawings by the aid of photography.

Some of the processes in use are comparatively inexpensive and easily worked; the more complicated formulas being more economical than the old method of tracing.

Singular as it may seem, the first attempts to utilize the action of light in the formation of pictures was for the purpose of making copies of line drawings and writings.

It was not long before the possibilities of the art had become so extended that the experimentalists of that period diverged into two main lines or branches, each with a definite object in view.

One set of experimentalists followed the original course, and endeavored to perfect the methods for the reproduction of drawings, more especially for the purposes of the engraver and etcher.

The result being that almost every class of engraving has profited by the use of the art.

The other branch of experimentalists worked with the desire to produce and fix the pictures from nature with all the gradations of light and shade, and to print the same, retaining the delicate half lights and shades.

That this was also successful may be seen in portraiture and views.

The "blue print" and some other process for making duplicate drawings, lay dormant for thirty or more years and then resumed.

In certain instances where processes were declared of no practical utility, they have been improved upon and made practical.

In some of the methods in use, the operator can procure paper already prepared, which is very convenient, but it is often useful to know how to prepare it when required.

Some of the processes tried during the earlier periods of the art as curiosities, are now being revised and experimented with by capable persons, and one in particular, the platinum, may be the process of the future.

Nearly all photographic formulas and instructions are based upon the supposition that the reader has already attained to some knowledge of the subject.

The object of these articles will be for the instruction of those who do not know. Even at the risk of being tedious the various manipulations and modifications required for office work will be described in detail.

Not a ray of sunlight can fall without modifying the structure and properties of the substances exposed to its action, and under certain conditions appears to impart to bodies some power by which they more readily enter into chemical combination with others.

Surfaces prepared in a manner to hasten their mutual reactions under the influence of light are termed sensitive or sensitized.

The science and art of photography deals with such changes for the production of pictures.

Such being the case, we will first consider the light, its quality and intensity being of the utmost importance.

The theory of optics will be considered only in relation to the subject before us.

The theory is that the blue or violet, and of the spectrum has the most intense actinic influence, a red or even a yellow light being used to light the "dark room," with the introduction of bromide, sensitive surfaces it was found that the yellow did not sufficiently retrain the actinic rays, and red lights were substituted for the yellow. Recently surfaces have been prepared, which are sensitive to the influence of both yellow and red rays, as red light does not afford the necessary protection, the question remains unanswered, how to light the dark room?

Heat hastens chemical action, therefore, it is not improbable that the red or heat rays assist in the chemical reactions under the influence of light.

Some have advised that the printing should be done under blue glass—no particular advantage appears by so doing.

For camera work and for printing, where the more delicate half lights and shades are to be brought out, the light may be graded to suit the work in hand.

For most printing from line drawings, a full strong sunlight is best, and in all cases the rays of light should strike the glass perpendicular to its face.

When the drawing is made upon paper, the light will work under the lines and mar the effect, more especially when the light falls obliquely upon the glass.

For blue prints, the best effects are produced by strong, direct sunlight, when the drawing is made upon paper unprepared. Indirect light is unreliable, when the drawing is on linen, or on paper made very translucent; an indirect light, as from the sky in an area may give fair results.

When such conditions exist, or when any combination of circumstances interfere with the direct rays of the sun, a series of experiments should be made, noting the time of day, appearance of the sky, whether clear or cloudy, how the light appears upon any surface which may reflect upon the work, noting at the same time the material upon which the drawing is made.

These experiments should be noted in a small book kept for the purpose, and hanging against the wall near the printing window.

In experiments to ascertain the proper time of exposure for printing, the following method will be found useful:

Take strips of the different materials used for the drawings, and make a few lines upon the face with the same ink as is used for the drawing; put these strips in the printing frame properly, set to strips of sensitive paper as used; expose in whatever light available, say, five minutes, then cover a portion of each strip with a heavy cardboard; expose five minutes longer, then slide the cardboard so as to cover another portion; continue these partial exposures till half an hour or so has passed; then remove from the frame, wash and fix.

It will be seen at once, what exposure to make, under existing circumstances.

If the chloro bromide process is worked, diffused light is to be preferred; in fact, it requires a few seconds only by gaslight.

It will be seen by the foregoing remarks, that whatever the conditions may be as regards light, some process can be worked even with gas or candle light.

Architecture as a Profession.

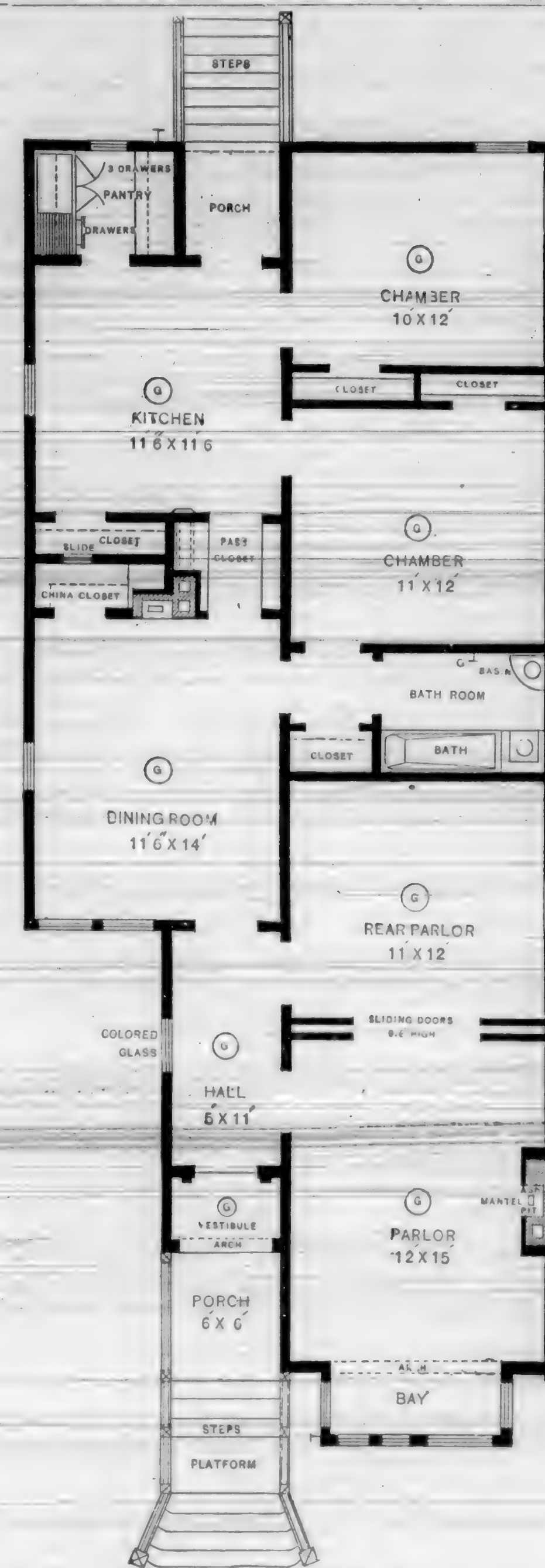
ONLY eagles and reptiles can attain to very high places, was the epigram of the witty Frenchwoman who in her day was also confronted with the idea contained in the saying, "There is plenty of room at the top." This, says the *Building Budget*, is perhaps the most grimly oracular remark ever uttered and misunderstood by the young, in whose bright lexicon there is no such word as fail, and has undoubtedly caused more heart breakings over misapplied lives than can be even approximately estimated. All professions are crowded with men, who dazzled by the prizes of wealth and fame, gained sometimes at a sacrifice of everything that makes life enjoyable, still struggle blindly on, though every one but themselves can see that they are forever doomed to disappointment. The only profession, if it may be so called, in which a man at once realizes his unfitness is that of the prize fighter. In this country there is one frequent cause of failure, viz., the short time which is requisite for a man to obtain a smattering of law, medicine, architecture, etc., so that a young man is everything by turns and nothing long, and after spending considerable good material, say for an architect, and just as he is really becoming of some use, thinks that the law or medicine is his forte or else thinks himself capable of setting up as a full-fledged architect, to the damage of the profession in general.

A youth wishing to become an architect in England has first to find a vacancy for an articled pupil in the office of some first-class architect, to whom his parents and guardians pay a premium, sometimes as high as five thousand dollars, and agree that the boy shall do all that may be considered as lawfully pertaining to the business of an architect, at the command of his employer, for the space of five years, frequently without any compensation whatever, excepting the use of the library, etc., found in all the important offices. During this time he has to support and clothe himself in the manner becoming a professional man, and accustom himself to doing whatever he is told without question. Knowing that at the end of his term he will have invested five of the most valuable years of his life, as well as several thousand dollars, he is naturally impelled to be diligent and to profit all he can by what he sees, hears, and reads—knowing that, if he does not, he will never reimburse himself for his outlay, and also that he cannot enter any other profession except at an equal expense of time and money, and that after a few years he will be considered to old to begin anything. This system has its advantages as well as its disadvantages. One advantage is that it renders a parent very careful to find out as far as possible if the bent of the boy is well defined, otherwise, at the end of the time, it will be so much thrown away.

The disadvantage is that an idle pupil who does not care to improve his opportunities goes away at the end of his apprenticeship, and throws, to a certain extent, discredit upon the office where he was supposed to have studied. English architects have become so impressed with this fact that many of them openly advocate the entire abolition of articled pupils, and prefer the encouragement of technical schools, where the old motto over the college door will be strictly enforced, "Learn or depart." America, in this respect, as in many others, has the advantage of profiting by the experience of the old world, and never having adopted the articled clerk system, now that it has proved unsatisfactory after years of trial, can, untrammelled by tradition, bend her attention to fostering those very technical schools which she already possesses, and which are advocated as a remedy for the evils of the older system by those who were once its strongest supporters.

Hints to Mechanics.

In hanging a number of doors which are of the same size, the time expended upon measuring the correct position of the hinges may be saved in a very simple manner, which is as follows: Take a lath and mark upon the top and bottom, the exact position where the hinges should come; drive in at these marks sharp pointed brads, and you have a gauge which may be used in hanging all doors of the same size. In using it all that is necessary is to place it against the edge of the door with the top of the lath on the level with the top of the door, give it a sharp tap of the hand, when the brads will mark the exact position of the hinges. The same gauge lath may be used in marking out the position of the hinges of the style of the door frame, excepting that a nail should be driven in the bottom of it, so that there may be sufficient room left at the bottom to allow proper play of the door; the use of a gauge lath in the case referred to, is an example of its use. It is of equal utility in hanging many other pieces, such for instance, as inside and outside blinds, shutters, etc.



Plan of "PRECITA."

Highly Interesting.

"A TIN ROOF" is the title of a little book just issued by Messrs. Merchant & Co., 517 Arch street, Philadelphia. The purpose of the publication is to supply to builders, architects and the general public some exact information as to the best methods of constructing a tin roof and as to the right materials to be used to secure satisfactory and permanent results. We especially recommend the book, which is intended for gratuitous distribution, to mill-owners. They are very apt to entrust the matter of roofing wholly to builders and they usually know really very little about the character of the tin used or the excellence or defectiveness of the job. This pamphlet will help them to protect their interests. It is very explicit, perfectly comprehensible, and we think wholly trustworthy. It is quite profusely illustrated and the cuts indicate processes of applying tin roofing which insure excellence.

Why Two Saws That Are Alike do not Always Run Alike.

BY "SUPERINTENDENT."

TAKE two saws from the same maker that are alike in size, gauge, speed, feed and hammering, and running in the same kind of timber. One saw works well when often the other will not work at all. They, being alike, should certainly run near enough alike that neither should be condemned. What can be the trouble? To take the theory of some saw makers, we cannot get out of the trouble, they claiming that no two saws can be made to run alike, same size, etc. We take it for granted that they allow us the discrimination, or the assertion would not be made; so, where we find that two saws do not run alike, there is a vast difference in the saws somewhere. When we take into consideration temper, teeth, etc., we find often why two saws made to run alike do not. We hear a great deal said about more teeth, the ones being set forth claiming the more teeth the saw has, the more feed it can stand, and make better lumber. To show how a great many are thus deceived when certain conditions are not considered. I know of a man who has a good mill, making good lumber, running on four-foot feed in pine. This idea of teeth struck him and he concluded to increase his capacity by adding more teeth. He made an allowance in his estimation of how much more he could cut, and cut the allowance in half. He was running fifty teeth in the saw, but concluded to order ninety teeth. He ordered of the same saw maker, and the saw came, hammered to speed. It was tried. It wouldn't go straight. Several trials were made, but the saw heated so badly on the rim that it was impossible to run it. So it was sent back to the saw maker and he couldn't tell why the saw did not go. The trouble was the saw had too many teeth, and the feed (four-inch) was not sufficient for each tooth to cut a chip but cut, or rather scraped the dust so fine that it escaped on each side of the throat of the teeth, and binding between saw and board, heated the saw. If the saw could have had the feed increased to eight inches it would have worked well. Both saws were alike. One run well; the other would not run at all. But, says one, they were not alike, one having forty teeth more than the other. We will then take them of the same number of teeth, speed, feed, gauge, timber, etc., hammered alike, and yet, one saw will run well and the other will not, one being of a milder temper than the other. The milder temper is soon condemned, the higher temper running well. The trouble is this: The milder temper expands more from centrifugal force, and from the start it is weaker on the rim and soon lets down; the higher temper remaining more firm, has slightly changed in its adjustment. The other is laid aside or sent back to the saw maker. The mill man is impressed that saw making is a kind of guess work, and that occasionally they make a good one. I am not claiming the high temper to be the best of the two.

When certain things are taken into consideration, the milder temper might have suited him best; speed might have been high enough to crack the higher temper, then the milder temper would have been the best saw. Two saws can be made to run exactly alike even when there is a slight difference in the temper. There are saw makers that claim to make saws to run alike, and so they do.

This little difference in temper is considered something, and the saw is hammered a little more open, and when a man jumps up twice as many teeth on the same saw, the saw maker notifies him that the saw will not work satisfactorily and explains why; and if a saw is sent to him he does not blame the saw maker if it does not go right.

There can be a little more deviation to this teeth business when a man is sawing soft timber, but in hard wood the teeth are confined to a limit. — W. W. Mechanic.

AN American machinist, who went to Japan to put up some machinery, says that the Japanese are excellent workmen and only too faithful copyists. One of them made a pulley pattern from a drawing; and to make sure of having it a solid pulley the draftsman made a wavy line over the center line in the drawing, to indicate, of course, that it was erased. What does the Japanese workman do but make a special saw to cut the pulley in two parts, exactly as indicated by the wavy line!

The Relation of Owners and Builders to Plumbing.

A. D. KEARNS, a St. Louis plumber, has addressed some very sound remarks to one of the city papers, which will make good reading outside of St. Louis, and we take the liberty of reproducing them:

"In order to bring before the public some of the evils that are present at all times with us, it often becomes necessary to open up matters of a personal nature, and ill feelings arise in consequence; yet, the opinion of all, individually and collectively, to a generous, democratic mind, should not encounter this biased feeling, where the object to be attained is for the good of the public, and for the advancement of the city's interests. Although it is a fact that one of the greatest sources of danger from our house drains is by bad workmanship, yet, too often is our worthy plumber censured and condemned for bad work when the real cause of the trouble is found in badly-constructed appliances and poorly-made pipes, which are forced into the market by unscrupulous dealers and jobbers.

"The allied interests of the dealer and plumber have of late years affected a wonderful combination throughout the United States, and so carefully are the lines drawn that this 'combine' works very advantageously for the people in many ways. Still, competition, sharp and unscrupulous, has been the means of forcing strict honesty out of the market, and we find miserable substitutes for what once were reliable and perfect appliances. It is to the use of such goods that our poorer people owe so much misery and sorrow.

"That the manufacturers of such goods are not wholly to blame for the deplorable state of such things can be argued from the fact that our wealthy capitalists and our builders, in the endeavor to cheapen their work, often neglect the needs of the plumbing system, put more money into embellishments that 'catch' the eye of the ignorant.

"This same cause of complaint can be charged to many of our best architects, and too often it has been said of our noble homes that 'they are beautiful sepulchres.' Why this condition of things should go on is a question of serious importance to us all. To whom is the blame due?

"The public need homes. Knowing this, capitalists, in the hope of gain erect these homes. Should not these wealthy speculators be responsible for the construction of the houses they build? It would appear so.

"The difference in the cost of a good system of plumbing, with safe, reliable appliances and materials is not very greatly in excess of a like system with poor fixtures and poor piping. The work of the plumber is precisely the same. In the end the poorer materials will cost far more than the good ones, for repairs are always necessary, while a perfect system, with good care, will last as long as the house of which it is a part.

"The remedy, then, of our trouble lies with the owners and builders of our homes, and it becomes their duty and is to their benefit to make our houses what they should be—safe, secure, and clean in so far as they are able. In return for money spent in a good, safe plumbing system, it is not extravagant to say such good results will come by reason of our healthier, happy homes, that the time is not far off when cheap, miserable, filthy retaining appliances, now so generally used, will be discarded.

"Our capitalists, householders and our builders should take all possible precautions and care with the house drain. The material for piping should be extra heavy cast-iron piping, free from defects such as sand-holes or improper casting. The whole piping system should be carefully tested by the hydraulic or water test, and inspected carefully in every part to note the minute leaks that sometimes escape notice. The appliances such as closets, basins, etc., should be of earthenware, and free from all concealed and filthy collecting parts. Each fixture should have a trap which should be self-cleaning and non-siphonable. All outlets from sink, basin or closets should be so constructed that the waste-pipe be filled "full bore" while in operation in order to insure thorough flushing. The entire system must be simple, well at top and bottom, and when all the fixtures have been attached the peppermint test will show the merits or demerits of the joints.

"Thus, with conscientious builders and careful plumbers the house-drainage system will soon prove a more profitable investment to the householder and owner, and in return for the money spent will come clean, well-ventilated and happy homes not only to the poor and lowly, but to the rich and prosperous, who now suffer like the poor from old and wretched appliances."

THE "WILLER" SLIDING BLINDS.

THE "Willer" Sliding Blinds, manufactured by William Willer, Milwaukee, Wis., have been in the market but a few years, but in that short period they have become so generally known amongst architects, builders, and the building public in general, that a detailed description of them here is unnecessary. The catalogue shows some 20 different classes or 20 distinctly different ways of arranging these blinds in the windows. For illustration we select Class E, this class being universally used for buildings of medium cost, on account of its simple construction and moderate price. This class consists of three separate sections of blinds, covering the entire window, and running in a guideway containing three grooves, one for each section of blind, all within the space of the window-opening, no pockets being employed at the bottom or top of the window.



Class E. Three Sections to the Window.
No Pockets.

The other classes in the catalogue show windows fitted with blinds of two, four and six sections, without pockets and with pockets at either the bottom, top or both ends of the window.

The "Willer" Blinds have rolling slats of a new construction throughout all sections, or in as many divisions of the blinds as may be desired; the springs are of the latest pattern, and the only springs adapted to hold the blinds in place. The blinds are handsomely trimmed with full sets of hardware, finger-plates, drop-handles and lifts, in Berlin or Genuine Bronze. Each set of blinds is finished complete, varnished, rubbed and polished as desired, and when fitted to the window is ready for use.

The "Willer" Blinds on account of their superior quality and merit, and their adaptability to windows of every description, have been selected

in preference to all others and accorded the first rank in all parts of the country. They are now being placed in the residence of the widow of the late Emil Schandeln, Vice-President of the Philip Best Brewing Co., of Milwaukee, erected at a cost of over \$300,000. Mr. Schandeln had examined all forms of Inside Blinds, and had given these the preference over all the others.

A public school house in Denver, Col., has lately been fitted with these blinds, the total order for the purpose amounting to nearly \$6,000.

award, made to any exhibitor of Sliding Blinds, and although there were others on exhibition, none of these has received any award, diploma or medal whatever. In their report the jury said: "awarded on account of excellent workmanship," etc. We print herewith an illustration of the Willer exhibit at the above Exposition, taken from a photograph; also a fac simile of the medal.

The firm employ a force of 150 men, of whom 110 are employed exclusively in the manufacture of these blinds. Their sales of their blinds for 1888 amount to over \$100,000. The blinds are in use in all parts of the country, from Maine to California and Manitoba to Texas. Over \$10,000 worth have been sold in Canada alone.

The firm will send their No. 8 Catalogue of 1888, free of charge to any architect or builder, etc., upon application.

They have now in press their new catalogue of 1889-1890, which will be issued about May, 1889, and from an advance description we have received from the same, it will be the most artistic and complete catalogue of its kind in the country.

They also make a specialty of fine stair work, of which line they will issue a separate catalogue in the spring.

Mr. Willer is introducing these blinds all over the Pacific Coast, and hundreds of owners can testify to their merits. Mr. G. H. Van Houten has the agency for Oregon; A. W. Young that of Sacramento and northern cities of California; S. E. Baur in Seattle, W. T.; D. D. McDougall in Spokane Falls, W. T. For the present all information for this City can be obtained at the office of this Journal.

Does it Pay to Own a Home?

A GREAT many people go on year after year renting a house in which to live and bring up their families. They move from place to place as the whim seizes them, and of real home life in its best sense, they know nothing. They do not stay long enough in any house to "take root." There are none of the hallowed associations about their domiciles which hang about the "old homestead," and so they go through life, wandering from house to house, and never finding a home until they reach that narrow house which becomes their final resting place.

Ask such a man as this why he does not buy a place and settle down, and he will reply, "Oh, it doesn't pay to own a house in the city." And no amount of persuasion can induce him to change his views. He urges the bugbear of taxes and insurance as a reason for not investing in a home, seemingly oblivious of the fact that his landlord has to pay all these expenses from his rental and still make a comfortable profit.

If the housekeeper would only look into the matter a little more closely, he would quickly ascertain that the only true economy lay in owning his own home. Aside from all the associations connected with the home, it is a money making proposition for a man of family to own his roof-tree.

The average business man who lives in a good locality must pay anywhere from \$50 to \$100 a month rent for a comfortable house. Say that he pays \$75 a month. That means an outlay of \$900 a year, or 10 per cent. on an investment of \$9,000. Every one who rents knows very well that few homes built for renting cost more than half that sum. In the course of ten years the renter will have paid out \$9,000 and have nothing to show for it but a pile of landlord's receipts. In twenty years (and many a man in this city has stood a drain of this size for longer than that,) he will have paid out over \$18,000, with nothing to show for it. And that by no means represents the whole truth. The man, who ten years ago, undertook to buy a house and lot in a good locality worth at that time \$9,000, finds himself to-day, with a property rising, worth from two to four times as much.

The man who exercises common prudence in purchasing a home in San Francisco will not only save the amount which he would have paid out for rent, but in the course of ten years his property will have increased in value by at least as much more.

In the meantime the expense for repairs, taxes and insurance will not possibly have been in the aggregate as much as one-fourth of the amount that would have been paid for rentals.

The home buyer thus, aside from mere considerations of sentiment (which are not to be overlooked by any means,) will find that in buying a home he not only does a really economical thing, but puts himself in a position to reap a large profit where otherwise there would have been a total loss.

The experience of home buyers in San Francisco abundantly bears out this assertion.

Exact Reproduction of the Willer Exhibit at Cincinnati, 1888, taken from a Photograph.

As a further attest to the superior quality of these blinds over all others, the firm has been awarded the Bronze Medal at the late Centennial Exposition, held in Cincinnati, July to November, 1888. This Bronze Medal is the highest and the only

Loggers' Fare in the Woods.

The first requisite necessary to obtain all the work from men of which they are capable, when working in the woods, is to provide an abundance of well cooked food. Second: to provide ample and comfortable sleeping accommodations. Without these two necessities, no man can do a full day's work satisfactory either to himself or his employee. When a man eats a hearty breakfast after a night's restful sleep, he enters upon his day's duties feeling fresh and satisfied, and is ambitious to do his share. Having performed all that is required of him during working hours, he naturally feels like having a rest. By giving the sleeping quarters a home-like appearance, furnishing late papers and magazines, providing a large stove by which the house can be kept warm, many of the visits to the tavern by the cross-roads will be dispensed with. Men who work must have recreation, and when it is provided for in the camp, the small expense attending the same will be more than returned by the extra work done by the men.

We do not think that in any part of the country, men in logging camps are better provided for than they are on this Coast. Manufacturers of lumber vie with each other in having their camp called the model camp. In fact, some of them induce their men to build their own houses near the scene of their daily labor. A school teacher attends to the education of the children. Religious services are held weekly. A doctor is located near by, whose services are gratuitously given to those who work in the camp, the "boss" paying him a stated monthly salary so as to have a physician always near.

All in all, the men who work in the woods on the Pacific Coast are as well fed and as comfortably housed as any working at the same occupation in any part of the globe.



CITY BUILDING NEWS.

Bay and Mason, three-story frame. Owner, Henry Wreden; architect, Henry Geilfuss; contractor, F. Klatt; amount, \$6,930; signed, February 9; filed, February 14. Payments: Framed, \$860; roofed, \$860; partitions set, \$860; brown coated, \$860; white coated, \$860; completed, \$860; \$1,770, 35 days.

Bartlett, near Twenty-Third, repairs. Owner, Hannah Armstrong; architect, M. J. Welsh; contractor, F. Sullivan; cost, \$4,350; signed, Feb. 27; filed, Feb. 27; limit, 70 days; \$1,087.50 framed; \$1,087.50 brown mortar; \$1,087.50 finished; \$1,087.50, 35 days.

Blazome between Fourth and Fifth carpenter work for two-story brick warehouse. Owner, Mrs. M. F. S. Searles; architects, Schulze & Meeker; contractor, Thomas H. Day; cost, \$7,560; signed, Jan. 28; filed, Feb. 7; sureties, C. S. Holmes and C. Hanson; \$2,500 limit; April 15, 1889; \$2,000 gallery joists and second story joists are in position; \$2,116 roof is on and tinned; \$1,548 completed; \$1,890, 35 days.

Blazome between Fourth and Fifth, brick and iron work. Owner, Mrs. M. F. S. Searles; architects, Schulze & Meeker; contractor, Edwin R. Shain; cost, \$5,999; signed, Jan. 28; filed, Feb. 7; sureties, P. Degan and W. C. Dougherty \$2,000; limit May 1, 1889; \$1,772 brick done to underside of second story joists, \$1,128 brick done to underside of ceiling, \$1,599 completed, \$1,500, 35 days.

Bush and Sansome, plumbing. Owner, First National Bank; architect, Wright & Sanders; contractor, Fritz & Kean; amount, \$5,050; signed, January 30, filed, February 14, limit, May 30, 1889. Payments: Installments on first day of each month to value of 75 per cent; balance, 35 days.

Bush street, Nos. 224 and 226, additions. Owner, estate, C. D. O'Sullivan; architects, Chas. J. I. Devlin; amount, \$1,845; signed, Feb. 19; filed, Feb. 21; limit, 30 days; 75 per cent. as work progresses; balance, 25 per cent. when completed.

Buchanan, near Turk, two-story frame; Owner, C. Whelton; architect, M. J. Welsh; contractor, R. Parker; cost, \$3,500; signed, March 1; filed, March 1; limit, 70 days; \$875 framed; \$875 brown coated; \$875 finished; \$875, 35 days.

Bartlett near Twenty-First, two-story frame. Owner, J. W. Williams; architect, M. J. Welsh; contractor, M. C. Lynch; cost \$3,775; signed, Feb. 20; filed, Feb. 23; limit, 65 days; framed, \$943.75; brown coated, \$943.75; completed, \$943.75; 35 days.

Castro corner Nineteenth, addition. Owner, George Dawson; contractor, M. Sherman; cost, \$2,500.

Collingwood and Seventeenth, two two-story frames. Owner, Mr. Gimble; contractor, B. Dryer; cost \$6,000.

Collingwood between Eighteenth and Nineteenth, four one-story frames. Owner, Mr. Schrieber; contractors, Spellman & Son; cost, \$4,000.

California and Octavia, carpenter work. Owner, Clinton Jones; architect, J. H. Littlefield; contractor, R. P. Hurlbut; amount, \$21,500; signed, February 5; filed, February 13; sureties, F. Joost and J. F. Kennedy; limit, June 25, 1889. Payments: 75 per cent. from time to time as work progresses; balance, 25 per cent. in 35 days.

California and Octavia, painting. Owner, Clinton Jones; architect, J. H. Littlefield; contractor, James Larsen; amount, \$1,635; signed, February 5; filed, February 13; surety G. Ammerup; limit, without delay. Payments: 75 per cent as work progresses; balance, 25 per cent in 36 days.

One and all are perfectly welcome to our reading room. We will be pleased to have you call and look over our exchanges. Rooms open from 9 A. M. to 4 P. M.

Our Reading Room.

Our Exchanges.

We have added to our office a large Exchange rack, to which any one, whether they subscribe or not, can have free access. We will be pleased to have you call, as the office is open from 9 A. M. till 4 P. M.

MANUFACTURER AND BUILDER.—This Journal is printed at 83 Nassau street, New York; it is one of the best of its character published. Lately, many new improvements have been made. The new design for the title page is very attractive. We have published many articles taken from its columns, and have always been pleased to credit the Journal from which they were taken. Brother Gerard, we wish you success, and only hope that soon a ton of paper will be necessary for each issue.

THE ART AGE.—The February number of this Journal presents a pen and ink supplement, entitled: "An Autumn Morning" by Bruce Crane. In addition, there are many designs given of buildings, notably that of the Grolier Club, Chas. W. Romeyn & Co., Architects. The price is but \$2.50 per year.

CANADIAN ARCHITECT.—Our friends across the line are determined not to be outdone, and so present a Journal as well edited and illustrated as many of those in the United States. We heartily congratulate the editor on the greatly improved appearance of his Journal.

California and Octavia, plumbing etc. Owner, Clinton Jones; architect, J. H. Littlefield; contractor, Fritz & Kean; amount, \$2,360; signed, February 5; filed, February 13; sureties, Wm. Little; limit, without delay. Payments: Sewerage completed, \$885; completed, \$885; \$590, 36 days.

California and Gough, two-story building. Owner, Daniel Meyer; architect, Jacob Lenzen & Son; contractor, Peter Crichton; amount, \$19,800; sureties, C. S. Holmes and C. Hanson, \$5,000; filed, February 5; signed, January 31; limit, six months. Payments: First story and joists are on, \$3,000; framed, \$3,000; roof completed, \$3,000; brown coated, \$3,000; completed, \$3,000; \$4,800, 35 days.

Capp, near Twenty-Fourth, one-story building. Owner, Marie S. C. Hundt; architect, S. G. Worden; contractor, S. G. Worden; amount, \$1,660; signed, Feb. 9; filed, Feb. 16; \$160 chimneys built; \$400 floors; laid \$400 completed, \$400 35 days.

California and Octavia, excavations and brick work of six dwellings. Owner, Clinton Jones; architect, J. H. Littlefield; contractor, James O'Sullivan; amount, \$2,675; signed, January 5; filed, February 13; sureties John Hammond; limit, without delay. Payments: 75 per cent. from time to time as work progresses; balance, 25 per cent, 36 days.

Devisadero, near Ridley, two story frame. Owner, H. E. F. Williams; architect, M. J. Welsh; contractor, A. J. Ahren; amount, \$3,808; signed, Feb. 20; filed, Feb. 27; limit, 90 days; \$952 framed; \$952 brown coated; \$952 completed; \$952 35 days.

Devisadero, near Ridley, two-story frame. Owner, H. E. F. Williams; architect, M. J. Welsh; contractor, A. J. Ahren; cost, \$3,880; signed, Feb. 20; filed, Feb. 28; sureties, W. A. Meeker, \$1,000; limit 90 days; \$970 framed; \$970 brown mortar; \$970 finished; \$970, 35 days.

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Elgin Park, near Ridley, two-story and basement frame. Owner, Wm. Becker; architect, Bernard Dreyer; cost, \$3,300; signed, March 2; filed, March 2; limit, June 1, 1889; framed, \$825; brown mortar, \$825; white mortar, \$825, 35 days.

Ellis street, No. 321, without delay, plastering. Owner, Wm. Wolfe; architects, Salfeld & Kohlberg; contractors, C. C. Morehouse; amount, \$1,175; signed, Feb. 6; filed, Feb. 11; sureties, John T. Grant, \$1,175; \$500 brown coated; \$375 completed; \$300 35 days.

Eight and Clementina. Owner, Leopold Jusic and wife; architect, O. E. White; contractor, O. E. White; cost, \$4,459; signed, Feb. 4; filed, Feb. 7; sureties, Chas. F. and Frank P. Doe \$2,000; limit 60 days; \$1,000 enclosed; \$1,344 brown coated; \$1,000 completed; \$1,115, 35 days.

Eighteenth, near Dolores, two-story building. Owner, Michl. Kane; architect, Chas. J. Devlin; contractor, A. A. Willis; cost, \$4,340; signed, Feb. 21; filed, Feb. 25; sureties, C. S. Holmes and Behrend Joost; \$3,000 limit, 90 days; \$500 framed; \$600 roofed; \$640 brown coated; \$500 plastered; \$700 ready to paint; \$215 completed; \$1,085, 35 days.

Eureka near Eighteenth, one-story frame. Julius Haug; contractor, August Discher; amount, \$1,500; signed, February 15; filed, February 21; limit, 90 days. Payments: Framed, \$375; first coat of plaster on, \$375; completed, \$375; \$375, 35 days.

Ellis, No. 321, without delay, excavations. Owner, Wm. Wolfe; architects, Salfeld & Kohlberg; contractor, Patrick Fitzsimmons; amount, \$695; signed, February 8; filed, February 13. Payments: Foundations in, \$300; completed \$395.

Ellis, No. 321, carpenter work. Owner, Wm. Wolfe; architects, Salfeld & Kohlberg; contractor, Henry Rohling; amount, \$6,450; signed, February 8; filed, February 13; sureties, J. J. McKinnon and F. Joost; limit, 90 days. Payments: Framed, \$700; roofed, \$1,200; inside finish on \$1,100; completed, \$1,830; \$1,620, 35 days.

Ellis street, No. 321, plumbing, etc. Owner, Wm. Wolfe; architects, Salfeld & Kohlberg; contractors, L. Ickelheimer & Bros; amount, \$1,175; signed, Feb. 9; filed, Feb. 13; limit, without delay; \$400 rough work done; \$475 completed; \$300 35 days.

Fulton and Scott, building. Owner, W. West-erfeld; architect, H. Geilfuss; contractors, Schmitt & Kreeker; cost, \$9,985; signed, Feb. 25; filed, Feb. 26; \$1,250 framed; \$1,250 roofed; \$1,250 partitions set; \$1,250 outside finish is on; \$1,250 inside finish is on; \$1,235 completed; \$2,500, 35 days.

Fifteenth, near Church, one-story frame. Owner, Wm. Nicol; architect, H. T. Bestor; contractor, Wm. J. Peters; amount, \$1,800; signed, Feb. 15; filed, Feb. 15; \$300 rustic on; \$300 brown coated; \$400 glass and sash on; \$350 completed; \$450, 35 days.

Folsom, between Tenth and Eleventh, three-story frame. Owner, Cal. Medical College Building Association; architect, John J. Clark; contractor, R. O. Chandler; cost, \$11,995; signed, Feb. 9; filed, March 1; limit, 120 days; \$2,375 framed; \$2,375 partitions set; \$2,370 inside finish is complete; \$4,875, 35 days.

Filbert near Powell, frame building. Owner, Carlo Casassa; architect, Wm. Mooser; contractor, G. Damkroeger; amount, \$4,100; signed, Feb. 8; filed, Feb. 11; sureties, Herman Mattern and W. J. Trott; limit, 90 days; 75 per cent. as work progresses; balance, 25 per cent., 35 days after.

Geary and Kearny, May 28, 1889. Constructional iron work. Owner, M. H. DeYoung; architects, Burnham & Root; contractors, Dearborn, Foundry Co; amount, \$63,000; signed Nov. 26; filed, Feb. 11; sureties, Christopher & Ed. Christy; 75 per cent. payable up to completion of work in proportional payments the 25th of each month, according to amount of work done.

Golden Gate Avenue and Lyon street, frame dwelling. Owner, R. L. Conn; architect, S. Hatfield; contractors, Farnum & Thornton; cost, \$2,400; signed, Feb. 6; filed, Feb. 9; limit, 81 days; \$550 roof boarded; \$415 brown coated; \$415 windows in; \$420 finished; \$600, 35 days.

Green, between Webster and Buchanan, two-story frame. Owner, Edward J. Duffield; architects, Copeland & Banks; contractor, John A. Shepard; cost, \$4,906; signed, Feb. 28; filed, March 1; sureties, T. H. Jones and J. P. Shepard; limit, 90 days; \$1,000 fram d; \$1,000 brown coated; \$682 white coated; \$1,000 completed; \$1,224, 35 days.

Haight corner Webster, three-story frame. Owner, John Cordes; architect, B. E. Henriksen; contractors, Rountree Bros; amount, \$7,755; sureties, JThos. Richardson, John Coop; signed, February 16; filed, February 19. Payments: roofed, \$1,454; outside finish on, \$1,454; sashes glazed and hung, \$1,454; trimmings on, \$1,454; \$1,939, 35 days.

Harrison and Fifth, stable. Owner, J. L. Moody; architect, Chas. I. Havens; contractor, F. W. Kern; cost, \$5,295; signed, Feb. 26; filed Feb. 27; sureties, Behrend Joost and O. W. Nordwell; limit, 40 days; \$1,000 roof rafters on; \$1,200 roof complete; \$1,595 completed; \$1,500, 35 days.

Howard, near Fourteenth, alterations, etc. Owner, L. Dumas; architect, M. J. Welsh; contractor, C. E. Dunshee; amount, \$1,691; signed, Jan. 31; filed, Feb. 11; limit, 40 days; \$600 rustic on; \$600 ready to plaster; \$491, completed.

Henry, between Noe and Ridley, additions. Owner and builder, P. N. Williams; cost, \$2,000.

Henry between Noe and Ridley, one-story cottage. Owner, Mrs. Ford; contractor, Mr. Brown; cost, \$1,300.

Jackson, near Fillmore, building. Owner, Katie Jacobs, et al; architects, Salfeld & Kohlberg; Contractor, John T. Grant; amount, \$5,087; signed, Jan. 20; filed, Feb. 13; sureties, C. S. Holmes & C. Hanson; \$5,000 limit, 90 days; \$800 framed; \$1,000 roof on; \$1,000 brown coated; \$1,287 35 days.

Jackson, near Mason, two-story frame. Owner, M. Hartmann; architect, Henry Geilfuss; contractor, L. M. Weissmann; amount, \$3,050; signed, Jan. 28; filed, Feb. 14; \$450 framed; \$450 partitions set; \$450 brown coated; \$450 white coated; completed, \$765 35 days.

Jones and Pleasant, frame building. Owner, George Whittell; architect, Clinton Day; contractor, C. A. Parker; cost \$4,475; signed, Feb. 1; filed, Feb. 8; \$900 ready to shingle; \$800 brown coated; \$800 stairs ready for painter; \$856 completed; \$1,119, 35 days.

Kearny and Post, shelving, glazing, etc. for store. Owners, Roos Bros; architect, Henry Geilfuss; contractor, George R. Bowles; amount, \$2,250; signed, Feb. 8; filed Feb. 15; \$1,687 50 set up; \$562 50 35 days.

Lyon, near Grove, two-story frame. Owner, Julia A. Campbell, architect, Chas. I. Havens; contractor, John G. Adams; cost, \$3,929; signed, Feb. 25; filed, Feb. 27; sureties, S. H. Harmon and F. Joost; limit, 90 days; \$700 enclosed; \$700 brown coated; \$750 outside primed; \$779 completed; \$1,000, 35 days.

Liberty, near Guerrero, two-story frame. Owner, D. W. Parkhurst; architect, A. J. Barnett; contractor, Brennan Bros; cost, \$5,800; signed, Feb. 4; filed, Feb. 28; sureties, Frank P. Latson and Martin Connor, \$3,000; limit 90 days. Payments to be made as work progresses, at the rate of 75 per cent. of value of work done, balance 35 days after.

Market, between Ninth and Tenth, repairs. Owner, Mrs. M. F. S. Searles; architects, Schulze & Meeker; contractor, John T. Grant; cost, \$2,800; signed, Feb. 2; filed, Feb. 9; \$1,000 boiler house is built and main building roofed and tinned; \$1,100 completed; \$700, 35 days.

Market cor Gough, repairs. Owners, Will & Finck; cost, \$1,200.

Mission, near Thirteenth, two-story frame. cost, \$1,800.

Market, near Noe, two-story frame. Owner, Dennis H. Boyle; architect, A. J. Barnett; contractors, G. W. Farnum and R. R. Thornton; cost, \$3,666; signed, March 1; filed March 1; sureties, Hugh B. Jones and Matthew Harris, \$2,000; limit, 60 days; \$800 main roof on; \$945 brown coated; \$1,000 completed; \$915, 35 days.

Market near Fourth, concrete work. Owner, California Academy of Science; architect, Percy & Hamilton; contractor, George Goodman; amount, \$3,294; sureties, Jeremiah Mahoney and Calvin Nutting; signed, February 2; filed, Feb. 2; limit, 30 days. 75 per cent. on first Saturday of each month as work progresses; balance, 25 per cent., 35 days.

McAllister near Lott, two-story frame. Owner, Ed. E. Cook; architect, Wm. H. Wharff; contractor, F. A. Williams; amount, \$4,739; signed, Feb. 21; filed, Feb. 21; limit, 90 days; sureties, H. C. Smith, \$2,000; \$700 framed; \$700 enclosed; \$700 brown coated; \$700 outside carpenter work done; \$754 completed, \$1,185; 35 days.

McAllister, near Gough, two-story frame and barn in rear. Owner, G. Ammerup; architect, H. Geilfuss; contractors, Von Borstel & Conrad; amount, \$5,350; signed, Feb. 18; filed, Feb. 19; \$800 framed; \$800 floor laid; outside finish on \$800; inside finish on \$800; completed, \$1,350; 35 days.

New City Hall contracts for the plinth course let to Antonelli & Doe. Value, 14,500; for finishing rooms, to McCann & Riddle; cost, 5,700.

Nebraska, near Sonoma, altering cottage and building new one. Owner, Henry Kohler; contractor, Thomas F. Mitchell; amount, \$1,914; signed, Feb. 18; filed, Feb. 19; \$638 old house is raised and frame of new one up; \$800 brown coated; completed, \$634.

Oak and Franklin, three-story building. Owner, John F. Schroeder; architect, H. D. Mitchell; contractor, Richard Sinnott; amount, \$12,300; signed, February 11; filed, February 12; sureties, H. C. Smith and W. J. Adams. Payments: First floor, \$2,000; rustic on, \$2,000; outside frames set, \$2,500; framed, \$2,500; 2,300, 35 days. Limit, June 15, 1889.

Powell, near California, additions, cost, \$500.

Pond, between Sixteenth and Seventeenth, two-story frame. Owner, Wm. Schottler; contractor, C. H. Murasky; cost, \$2,800.

Plymouth avenue, near Patton street, one-story frame. Owner, Mrs. M. K. O'Brien; architect, M. J. Welsh; contractors, L. Cuneo & Co; amount, \$1,725; signed, Feb. 13; filed, Feb. 14; limit, 70 days; \$400 roofed; \$400 brown mortar on; \$400 completed; \$525 35 days.

Point Lobos Ave. and Tenth avenue, two-story frame and barn in rear. Owner, Chas Callahan; architect, C. I. Havens; contractors, Chas. Johnson and R. J. Andrew; amount, \$4,400; signed, February 6; filed, February 19; sureties, A. F. Johnson and Geo. A. Hartman; limit, 112 days. Payments: framed, \$800; brown coated, \$800; outside primed, \$800; completed, \$900; \$1,100, 35 days.

Pacific, between Gough and Octavia, two-story building; Owner, Alice and Edith Hastings; architects, Percy & Hamilton; contractor, J. C. Bateman et al; amount, \$6,997; signed, February 1; filed, February 5; limit, 10 1/2 months. Payments: 75 per cent. on first Saturday of each month, of the value of work done; balance, 25 per cent, 35 days.

Sanchez and Ridley, two-story frame. Owner, D. McSweeney; architect, A. H. Daley; contractor, N. R. Ellis; cost, \$4,000.

Sixteenth, between Noe and Castro, two-story frame. Owner and builder, Mr. Hyde; cost, \$4,500.

Sixteenth, between Noe and Castro, two-story frame. Owner and builder, Martin Dempsey; cost, \$5,000.

Sixteenth, between Noe and Castro, two-story frame. Owner and builder, Mr. Smith; cost, \$4,000.

Second corner Frederick, three one-story and one two-story frames. Owner, R. Hughes; day work; cost, \$5,000.

South Park between Second and Third, three-story frame. Owner, Henry Joost; architect, Casper Zimierlein; contractor, Casper Zimierlein; cost, \$7,635; signed, Feb. 5; filed, Feb. 9; sureties, J. F. Kennedy; limit, 90 days; \$1,500 enclosed; \$1,500 brown mortar; \$1,500 white mortar; \$1,225 completed; \$1,910, 35 days.

Seventeenth, near Poud, one-story frame. Owner Mr. Henry; contractor, A. J. McKee; cost, \$1,700.

Stockton, near Sacramento, brick building. May 1, 1889. Owner, James Goetz; contractor, Rhody Ringross; architect, T. J. Welsh; amount, \$10,000; signed, Feb. 20; filed, Feb. 20; sureties, W. P. Doherty and Charles L. Hinckle; \$2,500 basement is built, \$2,500 columns set; \$2,500, 3d story is up and joists set; \$2,500 completed; \$3,775 35 days.

Sacramento, near Lyon, two-story frame. Owner, B. B. Dobbas; architects, B. McDougall & Son; contractors, P. J. and M. Brannan; cost, \$5,500; signed, Feb. 9; filed, Feb. 9; \$900 frame up; \$900 floors laid, etc.; \$1,000 brown coated, etc.; \$1,325 completed; \$1,375, 36 days.

San Jose avenue and Army street, grading and brick work. Owner, F. Kaufman; architects, Townsend & Wyneken; contractor, I. H. Wilson; amount, \$1,550; signed, Feb. 9; filed, Feb. 11; limit, 35 days; \$500 raised; \$600 brick work done; \$390 35 days.

Steiner and Sacramento, building. Owner, Georgette Bitter; architect, Wm. Mooser; contractor, J. H. McKay; amount, \$3,350; signed, Feb. 2; filed, Feb. 12; sureties, E. Depiere; limit, 90 days; 75 per cent. as work progresses; balance, 25 per cent. 35 days.

Seventeenth, between Mission and Howard, two-story building. Owner, Jacques Puchen; architect, Wm. Mooser; contractor, J. J. Lunn; amount, \$3,837; sureties, Behrend Joost, C. S. Holmes; signed, January 31st; filed, February 5th; limit, 90 days; Payments: 75 per cent. as work progresses; balance, 25 per cent. 35 days.

Twenty-Eight, near Church, one-story frame. Owner, G. Rolando; cost, \$800.

Twenty-Eight, near Church, two one-story frames. Owner and builder, R. Bergfeld; cost, \$3,600.

Twenty-Eighth, near Church, one-story frame. Owner, Winder; contractor, K. Taylor; cost, \$1,800.

Twenty-Second, near Fair Oaks, double tenement, frame. Owner, James C. Blair, et al; architect, H. F. Bestor; contractors, Doyle & Son; amount, \$2,950; signed, Feb. 14; filed, Feb. 16; \$175 rustic on; \$600 brown coated; \$600 doors, sashes and glass in; \$525 completed; \$740, 35 days.

Tehama, between Fifth and Sixth, additions. Owner, Caroline K. Bowes; architect, R. H. White; contractors, Moore Bros.; amount, \$1,865; signed, February 11; filed, Feb. 13; limit, 60 days. Payments: Ready to lath, \$700; white coated, \$600; completed, \$565.

Twenty-Fourth street, between San Jose and Guerrero street, May 1, 1889, two-story frame. Owner, Charles Thompson and wife; contractor, Christian Peterson; architect, Christian Peterson; amount, \$2,850; signed, Feb. 20; filed, Feb. 20; \$550 foundation in \$600 framed; \$600 partitions set; \$600 primed on outside; \$500 completed.

Texas, between Solano and Mariposa, two-story frame and basement building. Owner, J. Gardiner; architect, Wm. Fyffe; contractor, John M. Robertson, et al.; amount, \$2,600; signed, January 27; filed, February 2. No payment given.

Third and Stevenson, two-story and basement, brick. Owner, G. W. Beckh; architects, Schmidt & Shea; contractor, Chas. H. Ackerson; cost, \$20,850; signed, March 1; filed, March 2; sureties, C. Hanson and C. S. Holmes; limit, 100 days; \$10,000 ready for roofing; \$5,600 completed; \$5,250, 35 days.

Vienna and Naples, two-story frame stable. Owner, Wm. G. Loeme; architect, Emil John; contractor, Adam Miller; cost, \$5,300; signed, Feb. 25; filed, March 2; limit, May 1, 1889; framed \$100; outside boarded, \$1,000; upper floors are laid \$975; finished, 1,000; \$1,325, 35 days.

Washington and Baker, two-story frame. Owner, H. C. Firebaugh; architect, J. E. Kraft; contractor, W. Plums; amount, \$6,700; sureties, D. Wormser and F. Joost; signed, February 4, filed, February 5; limit, 105 days. Payments: Roof on, \$1525; brown coated, \$1,500; completed, \$2,000; \$1,675, 35 days.

AN ENGINEER'S SUIT His Claim for Inspecting the Plans of the City Hall Commission.

Calvin Brown has commenced an action against the New City Hall Commissioners to recover the sum of \$1,900, which he claims is due him for services rendered the city. The complaint sets forth that the plaintiff is a civil engineer, and was employed under a resolution adopted by the Commission in August, 1888, to make a scientific examination of the plans proposed for the new main tower, and the foundations of the McAllister street wings. He alleges that he performed the work and furnished the Commission with his views. He now asks for payment for his time and labor.

CURTIS vs. BENNETT.

A complaint filed in the Superior Court by John M. Curtis, sets forth that complainant and A. A. Bennett, on the 15th of February, 1883, formed a partnership for two years, as architects, under the firm name of Curtis & Bennett; that during the existence of said partnership they drew plans and specifications for a court house and jail to be erected at Eureka, Humboldt county, under a contract with the Supervisors of that county, for a remuneration of 5 per cent on the contract price for buildings, less \$400 paid on adoption of plans and specifications. The architects superintended the work on the building until October, 1885, when Bennett, as Curtis alleges, assumed the entire superintendence of the work without the consent of Curtis. The firm partnership was dissolved on the 15th of February, 1885, and their business affairs were settled between them,

except the Eureka contract. The contract price of this work was \$141,580, and it is charged that Bennett received \$7,079, of which he paid Curtis \$448, instead of one-half, which he claims to be entitled to. Curtis prays for an accounting and judgment for the amount found to be due him.

OAKLAND AND VICINITY.

Oakland mechanics are busy, and although the price of lumber has advanced slightly it is still within bounds, and sales are larger than ever.

The number of houses built since the opening of the year is 130. Not including the cost of the several large business blocks now building, the cost of new structures will aggregate \$430,000. At the present rate of growth Oakland will see an accession of fully 1,000 homes during the year, at a cost of nearly three million of dollars. From the bay to the foothills the signs of improvements are visible. The cottage predominates in numbers, and is an indication of ownership. Probably a larger proportion of the population of Oakland own homes than that of any city of like size in the United States. This evidence of thrift and prosperity is gratifying. Oakland will have a population of 100,000 by the year 1893. And this growth is mainly due to the ease with which homes are secured, by reason of the moderate rates for real estate and the facilities for purchase on the installment plan given by builders and dealers.

A larger number of contracts has been made and is being let or considered than in any previous first two months of the year in the history of Oakland. All mechanical branches are active, while the recent rains give great encouragement to hopes for a prosperous year in agricultural matters. Cities and towns will share in the prosperity.

W. T. Veitch states that he has a large amount of work in view and that the growth of Oakland is more steady and healthy than that of towns he has visited, where spasmodic increase was followed by a corresponding depression.

Mrs. T. B. Simpson is building a modern residence of eleven rooms on the northwest corner of Telegraph and Simpson avenues. Two-hig & Moore, contractors; Charles Mau, architect. The cost will be \$6,000.

A cottage of seven rooms, costing about \$2,000 is going up on Seventh and Alice streets. It is for the Kreyenhagen estate, and W. N. Concanon is the contractor.

A. P. Patridge is building an eight room residence on Ninth street, between Chester and Center streets, to cost \$2,000.

Mr. Edwards is building two cottages, one to cost \$2,500, the other \$2,000, on Tenth street, between Magnolia and Union.

J. N. Paul is building a cottage of six rooms on Jones street, between Telegraph and San Pablo avenues, to cost \$1,500. McCracken, contractor.

V. W. Gaskill is building two cottages on Twenty-seventh street, near Grove, each to cost \$1,300.

The * California * Architect * and * Building * News

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inches in width.

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SAN FRANCISCO, APRIL 15, 1889.

On Wednesday, May 1st, 1889, at the regular monthly meeting of the San Francisco Architectural League, an interesting stereopticon exhibition on "Scenes through Italy," will be delivered by Frank Shea, Esq., architect.

San Francisco Chapter American Institute of
Architects.

Never, since the first formation of the Chapter, has there been such a meeting of architects and students, as was witnessed on the evening of April 5th, at the new rooms 408 California street. In addition to a large percentage of the membership of the Chapter, many of the students of the Architectural League, and several draughtsmen from the various offices were in attendance.

George E. Voelkel was proposed for membership as a Fellow. Referred to Committee, Percy, Babson and Pissis.

Mr. Bestor remarked that E. J. Molera could not be present owing to unavoidable detainance, but it was the desire of the latter named to request the Mechanics' Institute to have at their next exhibition and to offer premiums for the best exhibit of building materials. In order to properly have the matter come before that Institution, it was proposed to have a committee appointed by the Chapter to confer with committees from other associations and decide on some course of action. He would, therefore, make a motion to that effect. Committee appointed, Bestor and Percy. The communication from the Builders' Association in regard to the appointment of a committee on "Legislation" was favorably received and on motion S. Babson and J. E. Wolfe were appointed as such Committee. Mr. Sanders then began the reading of a most interesting paper on the subject, the "Age of Iron." The speaker gradually traced the different formations, through the various geological periods; from the mine to the foundry; from the manufactory to the bridge and building where the material was to be used. The whole paper was beautifully illustrated by dissolving views. The views of various bridges throughout the world was the most complete ever seen in the city. Beginning with the massive structures of ages past, the various developments in construction were successfully shown, until the modern iron bridge with its long spans, its light and airy grandeur combined with wonderful strength, was shown in all its grandeur. All the details of construction were successfully pictured on the canvas. Turning from the subject of bridges, the speaker portrayed the uses of iron in the construction of roofs.

The lecture was listened to with profound attention, and the beautiful illustrations brought forth murmurs of applause. At its close, the speaker was tendered a vote of thanks by the Chapter and the paper was ordered printed in full in the CALIFORNIA ARCHITECT.

Many of those present were in the new rooms for the first time and expressed themselves as well pleased with the arrangements. It is already necessary to enlarge the meeting room and a further space of sixteen feet will be added, making the room sixteen feet wide by fifty-four feet in length. This will be ample for some years to come. Students' room is also on the same floor.

The next meeting will be held on Friday, May 3d. Visiting architects are always welcome to the rooms and to the meeting of the Chapter.

Venice and Rome.

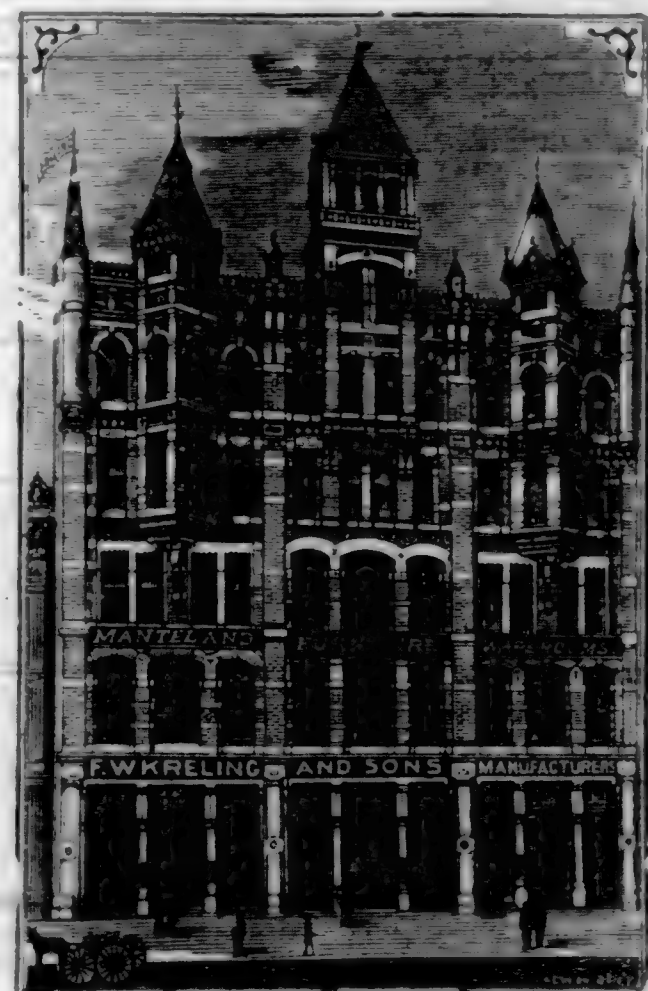
Lecture Delivered by Miss Jewett, Before the San Francisco
Architectural League.

The regular monthly meeting of the league was held Wednesday evening, April 3, 1889, at their rooms, 408 California Street, with Vice-President J. F. Wieland in the chair, and eighteen members present. Messrs. Smith, O'Brien and Wetmore elected members, and Messrs. Bugbee, Larsen and Pass were proposed as members of the league.

After the business of the evening was completed a very interesting lecture on "Venice and Rome" was delivered by Miss F. Jewett, the well known High School teacher, who was introduced to the league by President Louis Stone.

Miss Jewett, who recently returned from Europe, described her impressions of Venice and Rome very clearly. Her remarks were illustrated by a very fine collection of large photographs, which added greatly to the interest of her hearers.

In entering Venice, you arrive by train, in the northwestern part of the city, and are taken by gondoliers through the Grand Canal, which passes southeasterly through the city, and is two miles long, and varies from forty to sixty yards in width. She spoke of the luxuriousness of the gondolas, which glide along so quickly, and with so little apparent motion that it seems to go by magic. Especially is the feeling intensified as the gondolier stands behind the passengers, and one does not see the actual



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SAN FRANCISCO, CAL.

motive power. The lady described the "Rialto Bridge," and "Bridge of Sighs," which span the Grand Canal in single arches, and are entirely built of marble. She was greatly impressed with St. Mark's Church, with the beautiful Mosaic work, of which there is 47,000 square feet in the building, and of the magnificent effect of the afternoon sun upon the gilding, and the rich mosaic work in the spandrels of the arches. The Doge's Palace and Palace of Desdemona were also described, with their beautiful gothic tracery, and immense variety of carved capitals, every one being different. A large number of photographs of the Campanile, Doge's and Desdemona's palaces, St. Mark's Church, the many bridges and other points of interest were passed around among the members, who manifested great interest, and asked many questions. From Venice, Miss Jewett carried her audience to Rome.

Rome is entirely surrounded by a wall fifty feet high and eighteen feet wide, which is complete and in excellent condition. Miss Jewett, in describing the "Strangers' quarter" in Rome, said that the streets of that part reminded her of the new portion of New York City, as there are many five-story apartment houses of modern construction, of much the same appearance. She described the monastery of the Capuchin monks, and exhibited a photograph of the interior, showing the walls and ceilings decorated with skulls, vertebrae and other parts of the bodies of monks who died there.

From describing Rome generally, she came to the center of attraction, the great church of St. Peter's and the Vatican. She was one of the 90,000 people who occupied St. Peter's during the Pope's jubilee, last June. At the jubilee, invitations were issued only to fill the nave and the transepts, or 120,000 people could have been placed in the body of the church. She spoke of the great size of the Vatican, with its 13,000 rooms, and vast retinue of servants.

The splendid photographs of the St. Peter's, Arch of Constantine, the Roman Forum, Colosseum, the many temples, statuary and fountains, were especially interesting to the league.

At the conclusion of the lecture a vote of thanks was tendered Miss Jewett for her kindness in consenting to lecture before the league.

On the 17th of this month there will be a lecture delivered on "Chemistry," by Mr. D. C. Stone, who will illustrate his subject with a number of experiments.

The following is a list of the San Francisco Architectural League's membership and its officers:

MEMBERS.

Lionel D. Deane, Geo. H. Sanders, Augustus Borradale, J. F. Wieland, Geo. P. Wetmore, Obert F. Simpson, Joseph W. Rowell, Samuel Benson, Sylvester W. Hemenway, C. Herbert Hastly, Victor Monet, Carl Hilpisch, F. Rabin, R. M. Turner, Smith O'Brien, W. C. Mahoney, Louis Stone, Alfred Owen, J. Brady, M. G. O'Brien, H. J. Van Vlack.

BOARD OF DIRECTORS.

Louis Stone, President; J. Farley Wieland, Vice-President; Lionel D. Deane, Treasurer; S. W. Hemenway, Secretary; William Shea, Augustus Borradale, R. M. Turner.

SEMI-ANNUAL COMPETITION

.....OF THE.....

San Francisco Architectural League

Open to all draughtsmen and students in City of San Francisco. Subject, "Town Library," with requirements as follows: Entrance Hall, Library proper to accommodate 20,000 volumes, Librarian's and Reference rooms, Newspaper and Periodical room, Ladies' and Gent's Toilets. Location—Center of square. Material—Stone, Brick or Terra Cotta.

All drawings are to be designated by motto and accompanied by letter with name of competitor. They must be sent to S. W. HEMENWAY, Secretary of the League, room 6, 418 California Street, not later than May 14, 1889.

A committee of three prominent architects will be appointed by the League to decide the competition.

First prize, gold medal; second prize, silver medal.

S. W. HEMENWAY, Secretary. LOUIS STONE, President.

An Examination for Architects.

It would seem needless, after the experiences of the last few years, to urge upon our lawmakers the necessity of an examination for architects. I am not pleading for the "regulars," neither am I opposing the "quacks," but as an architect, looking after the interests of my clients and the public welfare, I must advocate measures which, in my opinion, will tend to remove the cause of many building disasters.

Our profession is made up of three distinct elements: First, students from technical institutions; second, students from the offices of architects; third, those who have "picked up" the business. Of the first element—technical students—there are two classes: those who have taken the regular four-year course, and others who have been put through by telegraph in two years. Although the number of practicing architects who have taken the four-year course is small, they exert an elevating influence upon the profession, and such a course will be the rule instead of the exception in a few years. The two-year course of the "specials" does them no harm, and when supplemented by a few years in the office of a skilled architect, they become sufficiently familiar with the profession to practice without injurious results.

Those composing the second element who have been fortunate enough to get a liberal education, and have made themselves familiar with the standard architectural work, have an aptitude for the work, and who have been connected with an architect for three or more years, have thus far proven the most successful architects. Aided by able and intelligent papers like the *American* and *CALIFORNIA ARCHITECT*, these architects have brought the standard of the profession to its present elevation, and are working hand in hand with the institute graduates to raise it still higher, and at the same time are educating the public to understand the difference between good taste and abjectness.

The third element, those who have "picked up" the business, have shown excellent judgment in choosing something to "pick up;" they display commendable ambition in seeking to elevate themselves by their own bootstraps. They certainly are not to be blamed for wishing to ally themselves with a profession, the members of which prosper only as their fellow men prosper, and the history of which is the world's history. But have the public no rights in the matter? Are important questions of construction and design to be intrusted to those who, like Miss Wozenham's relatives, have "failed in pick?"

We can liken the standard of architecture to that of literature, and the public will say, "All books can be published, why cannot all styles of buildings be erected?" But the public cannot be compelled to read all the vicious or absurd works which get into print; but we are absolutely obliged to look upon abortions in architecture, because they surround us on every side. Yet this is, perhaps, the least of the evils resulting from "picking up" the business.

That many human lives have been sacrificed because of ignorance of the principles of construction, who can deny? That today many important buildings are being erected in a manner discreditable to this age, and false in nearly every principle of construction, is a fact, which, if the matter is honestly investigated, must be acknowledged. True, our building laws are good, and our inspectors intelligent and watchful; but a skillful and conscientious architect is better than both put together.

Light, heat, and air, upon the proper distribution of which every human being is dependent, are all utterly ignored by this "picking-up" genius in architecture, as he goes blundering through the world, making life shorter and more disagreeable by his ignorance of the principles of the profession upon which he wished to grow financially fat. But, it will be asked, may not some of the first two elements be also incompetent? Are they as likely to be? And will not the examination be a fair test of the abilities of all?

We need an examination for architects. The first element does not object to it, the second will welcome it, and the public safety requires that no one ignorant of the principles of construction should be allowed to construct.

W. H. M.

We are in receipt of the advertisement of the Dunning Boiler which appears on page three, with a very suggestive motto which is strikingly peculiar, as we do not know of any other steam heating boiler having such an established record. The motto is "The sun never sets upon the Dunning Boiler because it is in use all over the world." Read advertisement and apply for catalogue with full information as to its merits.

OUR ILLUSTRATIONS

The California Hotel and Theater.

THE California Hotel and Theatre Building, situated on Bush street near Kearny in San Francisco, will be one of its representative structures and in fact may be put down as the first strictly modern hotel and theatre building in this city. As the accompanying cut in this month's issue of the *ARCHITECT* indicates the style of architecture, of the front is in the modern Romanesque and the object of the architect has evidently been to produce a building which would attract notice more on account of its dignity, lines of proportion and symmetry, rather than the elaboration of ornament and the crowding the front with projecting excrecences so common to San Francisco architecture. The two lower stories of the front are of rock faced Arizona brown stone. Above that point the remaining stories are in red pressed brick and red terra cotta. A description of arrangement of the front would hardly be necessary as the accompanying cut gives a perfect idea of the front when finished, but it might be well to state that the arches at main entrance to theatre and at the hotel entrance are richly carved. The interior of the hotel, as well as the entrance to the theatre will be finished in the Romanesque school of architecture. The interior of the theatre in the East Indian. The hotel will be supplied with every adjunct of a strictly modern and first class hotel. It will be heated by steam and lighted throughout by the incandescent electric light. In general arrangement and finish the hotel will be second to none in this country, and San Francisco can not only speak with pride of the elegant cuisine of its restaurants as it is noted for this, but will soon be able to boast of a cafe whose surroundings will aid its patrons to a better enjoyment of the good things served. Regarding the theatre, one of its most important features is the absolute safety to its patrons. It stands by itself detached from any other building, with exits and iron stairways on all sides. It has four independent exits on each floor from the auditorium and two from the stage, the aggregate width of exits being seventy-four feet. Next to the question of safety to patrons is the one of perfect lines of vision and on this point it can be definitely stated that there is not a single seat even in the back of Proscenium boxes, that do not command a view of the entire stage. The question of ventilation has been thoroughly considered, and the architect guarantees a change of air in the house every fifteen minutes, and says that the question of acoustics has given him no uneasiness as he has built nearly fifty theatres and holds the indorsements of the most prominent stars of the profession, regarding the perfection of the acoustic of every theatre. The stage is fitted with every modern appliance and it will be supplied with an equipment of scenery unexcelled for variety and modern effects by any theatre in the eastern metropolitan cities. The comforts of the profession has not been neglected, as an addition has been added to the building which is devoted to their use, furnishing fifteen dressing rooms, each having a window opening on to the open court and supplied with hot and cold water, marble make-up stands, etc., with toilet room on each story of addition. There are also commodious scene rooms, property rooms, etc., a carpenter shop sixty feet long disconnected from the stage.

The entire theatre is supplied with the Barnes Automatic Fire Extinguishers and with stand pipes and thirteen hose reels in plain sight and so distributed through the auditorium and stage, and adjusted that an incipient fire could be extinguished instantly without the aid of the fire department. To operate this apparatus there will be at all times in the building during an entertainment, firemen detailed by the fire warden. The theatre will be supplied with ladies' retiring and toilet rooms, and gents' smoking and toilet rooms. The opera chairs, carpets and draperies were designed expressly for this house and everything in the line of architectural design, decorations and furnishings will be thoroughly East Indian. The entire building will be practically fire proof. The building is being erected by Mrs. Kate M. McDonough who left with her family for Europe before it was commenced and whose interests are represented by her attorney, Mr. E. F. Preston of this city. The architecture and superintendence of the work was entrusted to Mr. J. M. Wood of Chicago, upon the recommendation of Messrs. Booth & Barrett, the eminent artists who will dedicate the theatre on the evening of the 13th of May, 1889, and there is no doubt

but that it will be one of the greatest events in the history of San Francisco. Mr. Wood is now building the Benhawk theatre of Los Angeles, California. The Loring of Riverside, California. The Tacoma theatre of Tacoma, W. T., and is completing plans for an elegant theatre and business block at Portland, Oregon. A magnificent theatre and bachelor apartment building at Denver, Colorado and a hotel and theatre at Lincoln, Nebraska.

CUT-STONE WORK.

The stone of which the front is being built came from Flagstaff, Arizona, and is of beautiful reddish brown color, of a very dense nature and has the property of withstanding the most intense heat. It can be quarried to any size or dimension required for any ordinary purpose. Blocks have been taken out 20 feet long, 10 feet thick and 15 feet broad. Were it necessary to order larger stone, the only drawback would be the means of transportation, as the average railway car only carry a specified weight. The new Court House, now being built by O. E. Brady in Los Angeles, will have two stories of this stone, also the new Post Office in the southern metropolis, as well as numerous other buildings. Since the introduction of the stone about one year ago, the demand for it has steadily increased, until now the proprietors find it onerous to fill the many orders. The stone is handled in this part of the state by O. E. Brady, the gentleman who has put up the cut stone work of our present sketch and from the quality of work performed by Mr. Brady, the fact is evident, that he will be able to point with pride, in the future, to the new California theatre and hotel.

IRON WORK.

The iron work of the California Hotel and Theatre was furnished by the Joshua Hendy Machine Works. Our description of this massive structure would be incomplete without reference being made to the heavy cast iron columns, girders and stairs which form so important a part, and add strength to the building.

This work was performed under a contract with the Joshua Hendy Machine Works, of Nos. 39 to 51 Fremont street, this city, in which corporation the City Iron Works have been merged, and this capacious and admirably arranged foundry is now situated at, and has recently been erected on the block bounded by Kearney, Bay, Dupont and Francisco streets, and where they are prepared to furnish architectural iron work, and light and heavy castings of every description. And the character of the work supplied for the use of this building, attests their ability in this department.

INTERIOR WOOD WORK.

The interior wood work for this elegant structure is being manufactured by the well known firm of F. W. Kreling & Sons, 532 to 536 Market street, from designs furnished by J. M. Wood, the architect, and abound with beautiful ideas. The main entrance will be one of the features, with red oak finishes, beautifully carved. The doors will have elegantly stained glass in upper panels, the lower ones being of metal.

Removal Notices.

Chas. J. I. Devlin has moved from 330 Pine street to 240 Montgomery street. The new offices are very handsome in their appointments.

Chas. Geddes has moved from 528 California street to 415 Montgomery street.

Reid Bros., formerly of San Diego, and architects of the Colorado Beach Hotel, have opened an office in the McCreery Building, 213 Sansome street.

John W. Curtis, so long at 528 California street, has moved to the Thurlow Block, 126 Kearny street.

M. T. Welsh has moved his office to the corner of Market street and City Hall avenue.

Under a New Management.

This journal is now under the control of the "ARCHITECT Publishing Company." All accounts due are payable to the company, at their new offices, 408 California street, rooms 14, 15, 16 and 17.

Iron Beam and Girder Connection.

THE strength and safe bearing loads that rolled iron and steel beams will bear, in the tables of our text-books, are based on loads evenly applied, either upon their top, or equally on each side, as in the support of brick or other arches, so that all the resisting parts of the beam are uniformly employed in support of the load.



Fig. 3

In figure 3, the beams *d* and *dr* form a girder, each bears its proportion of the load of beam *c* on its top, and the compressive and tensile resisting parts of each beam are equally employed in the manner intended in the tables of strengths and safe-bearing loads of beams; deviate from these direct applications and the beams will fail to sustain the loads given in the text-books.

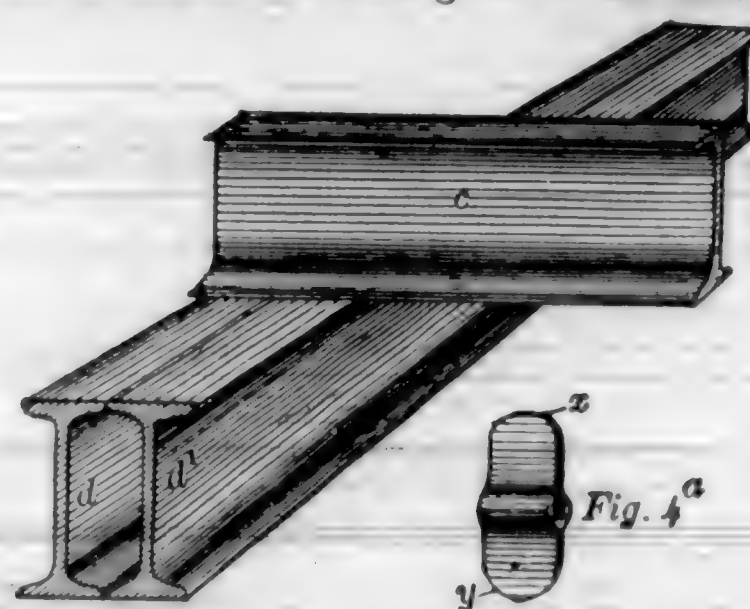


Fig. 4

In many cases this construction (figure 3), with the beam upon the top of the girders is not admissible for want of room, as for the support of vault roofs under sidewalks, floors of buildings and the like, to meet this requirement the faulty construction shown in figure 4 is frequently used.

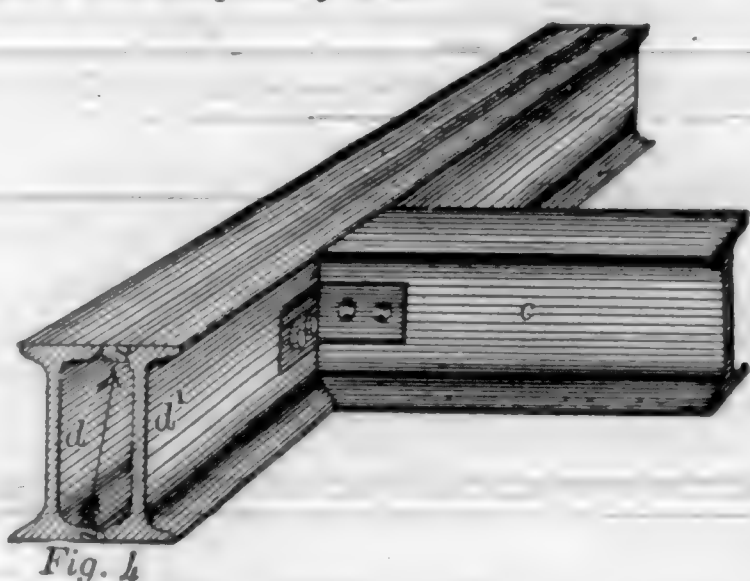


Fig. 5

In figure 4, the beams *d* and *dr* form the girder, and sustain the load of the end of beam *c*, but each beam of the girder is engaged quite differently than in figure 3 as hereafter explained, and it is questionable if the two are much or any stronger than if the girder was but a single beam with the load on its top. In this figure the single beam *dr* of the girder supports the weight of the end of the beam *c*, and to the disadvantage of its strength upon one side, and that upon a single bottom flange. The diaphragm *ga*, when in place, fits between the beams of the girder, and is employed as explained in the next section as a medium to transmit the strength of beam *d* to its companion beam *dr* which carries the load of the end of beam *c*.

The deflection of the beam *d* from carrying the load *c* independently considered, is not directly in a downward direction, but inclines towards the side load it is carrying.

Downward deflection is resisted on the opposite side of the beam to the load, by a diagonal upward resistance or pressure from the bevel top edge *x* of the diaphragm *ga* when in place by pressing under the flange *x* of the beam. This pressure is impelled by the bottom of the diaphragm at *y* resting upon the single bottom flange *y* of the companion beam *d*.

The direction of this assisting diagonal upward force is indicated by the arrow in figure 4, and tends to further distress the already burdened beam *dr* by forcing it abnormally and straining it across the web.

With two solid beams of timber this severe application of the load on one side would not have the same effect.

The treatment of the loaded beam *d*, figure 4 may be compared to the man shown in figure 3b carrying a heavy load in one hand sufficient for two men, bending him over in the direction of the load, and his companion assisting him (an equivalent to beam *d*) by forcing up his shoulder opposite the load, further contributing to double up the loaded man in the direction of the load.

The strength of the assisting beam *d* considered independently, loaded as it is upon the single flange *y* and upon one side, cannot be much in excess of one-half its normal strength when loaded properly on its top as in figure 3. Therefore, the strength of the two beams *d* and *dr* forming the girder in figure 4, may be considered not greater than a single beam girder properly loaded.

One instance of this faulty construction is in the girder beams supporting the vault roof and sidewalk of buildings No. 309 to 317 Market street, this city, beam *dr* of the girder is deflected more than its companion beam *d* from carrying beam *c* with the incumbent vault-roof and sidewalk, and the deflection of *dr* varies in proportion as the sidewalk is loaded, causing it to leak between the beams of the girder whenever it rains.

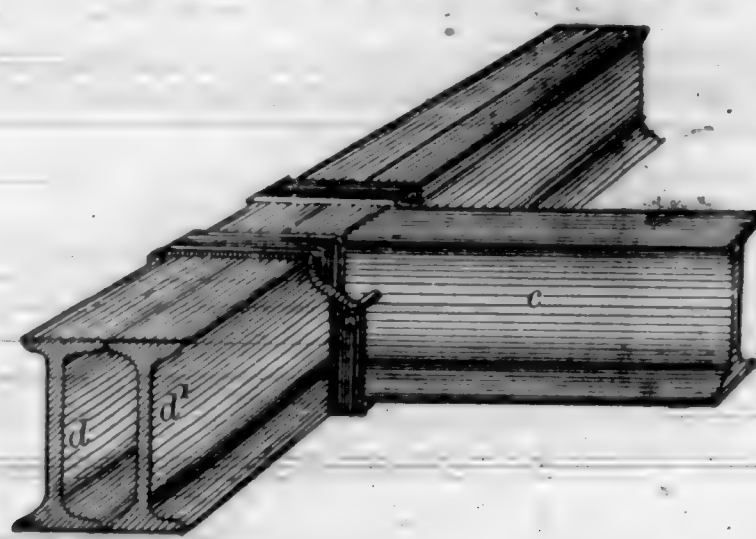


Fig. 6

Figure 5 is the same construction as figure 4, but an effort is made to remedy the fault by using a bridge or stirrup iron, one end of which is secured to the back of beam *d*, and passing over the tops of beams *d* and *dr* and down, receives and supports the end of beam *c*. The diaphragm *ga* is used between the girder beams with the result as described in figure 4.

The supporting value of this stirrup iron in addition to that shown and described for figure 4, is only what weight it will take to bend two strap irons, each a half of five-eighths inch in thickness, across the edge of beam *d*, if for a 10 1/2 inch beam would be at a leverage of 4 1/2 inches the width of *dr*. This will not exceed 250 or 300 pounds. Figure 6 shows the stirrup iron bent from the load.

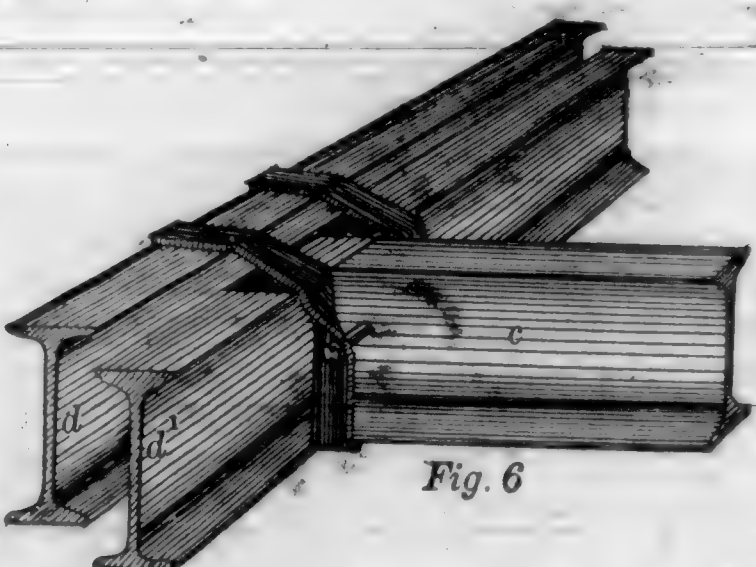
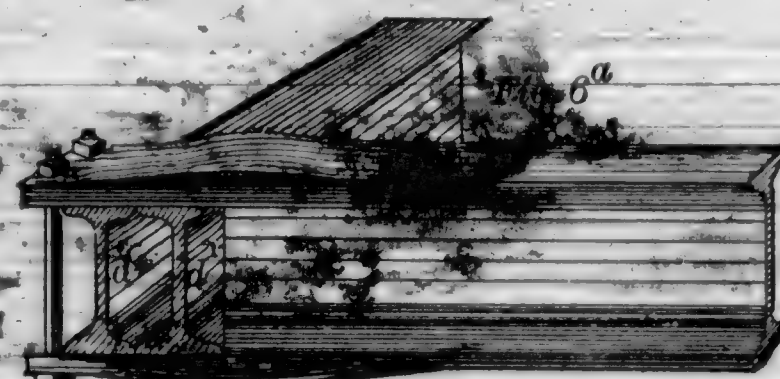


Fig. 7

Roller iron and steel beams are costly, their top and bottom flanges are adjusted to resist compressive force and tensile strain, and are connected by a thin web; with the load applied

in a direct manner they fulfill the intention for which they are proportioned, but deviate from it, and their strength is diminished in proportion to the treatment, and largely in cases of figures 4 and 5. This has been the writer's experience in testing over 700 iron beams and girders by weight and hydraulic pressure for the Department of Buildings of New York City.

The strength of any construction is that of its weakest part. It is evident if the top and bottom flanges at the end of beam *c* (with the web between them cut away) extended above and beneath the beams of the girder, and were bolted to each other at the back, and the junctions of the flanges to the main part of the beam was of increased thickness to provide against any possible bending, as in figure 6a, when employed, it would be the same as if the entire beam *c* laid on top of the girder beams, as in figure 3.



It is evident if the top and bottom flanges at the end of beam *c* (with the web between them cut away) extended above and beneath the beams of the girder, and were bolted to each other at the back, and the junctions of the flanges to the main part of the beam was of increased thickness to provide against any possible bending as in figure 6a, when employed it would be the same as if the entire beam *c* laid on top of the girder beam as in figure 3.

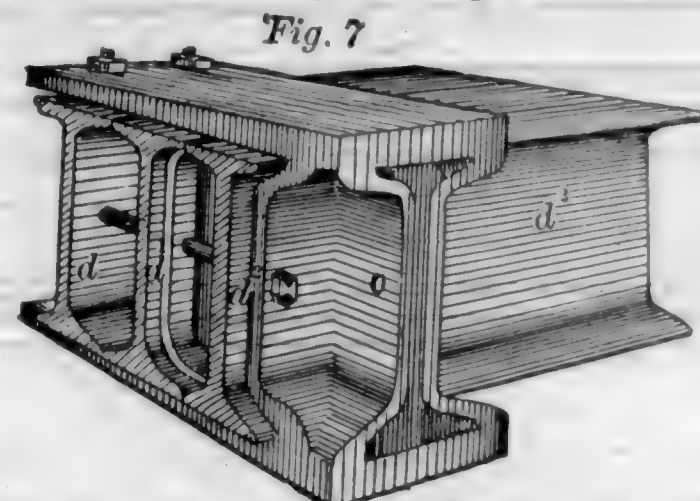


Fig. 9

The writer invented to meet this purpose what is shown in figure 7, a heavy cast iron shoe, which is rigidly secured to the end of beam *c*, and becomes an extended part of it, with heavy top and bottom tongues or flanges (equivalent to the top and bottom flanges of beam *c*, with the web between cut away, as described for figure 6a). These project over the top and bottom of the beams of the girder and are bolted to each other at the extremity. These two flanges are equal to the single top flange of beam *c*, of a combined thickness of both. These combined tongues or flanges bolted to each other from their thickness, width and shortness of span are rigid against bending, and are fully equal as if beam *c* rested on top of all the beams of the girder, as in figure 3.

This met the problem.

The great weight of the cast iron shoe (to be consistent in strength with remaining part of beam *c*) with the bolts, are fully 200 pounds. This, together with the expense of punching holes in the beams, makes them so costly as to forbid their general use in competition with the cheap and frail constructions before described. But they are in use in several prominent buildings in San Francisco.

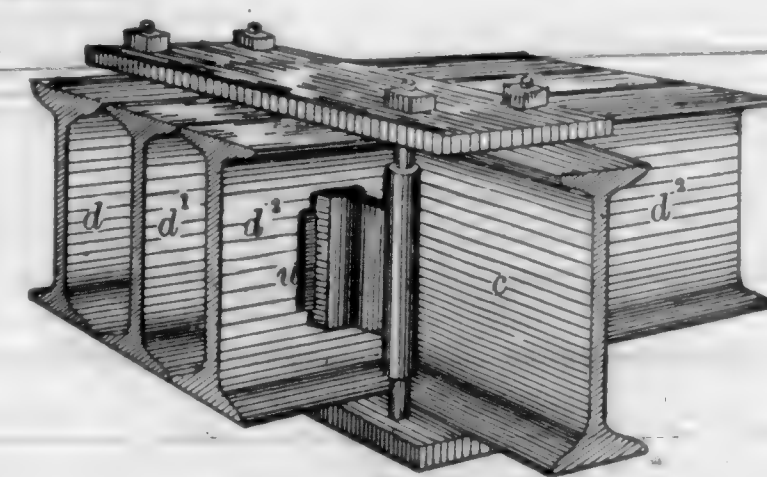


Fig. 10

The writer afterward devised to meet the demand for a cheaper article, a wrought iron shoe, as shown in figure 8, composed of two heavy wrought iron plates, equivalent to the two tongues or flanges described before, for figure 7, of a combined

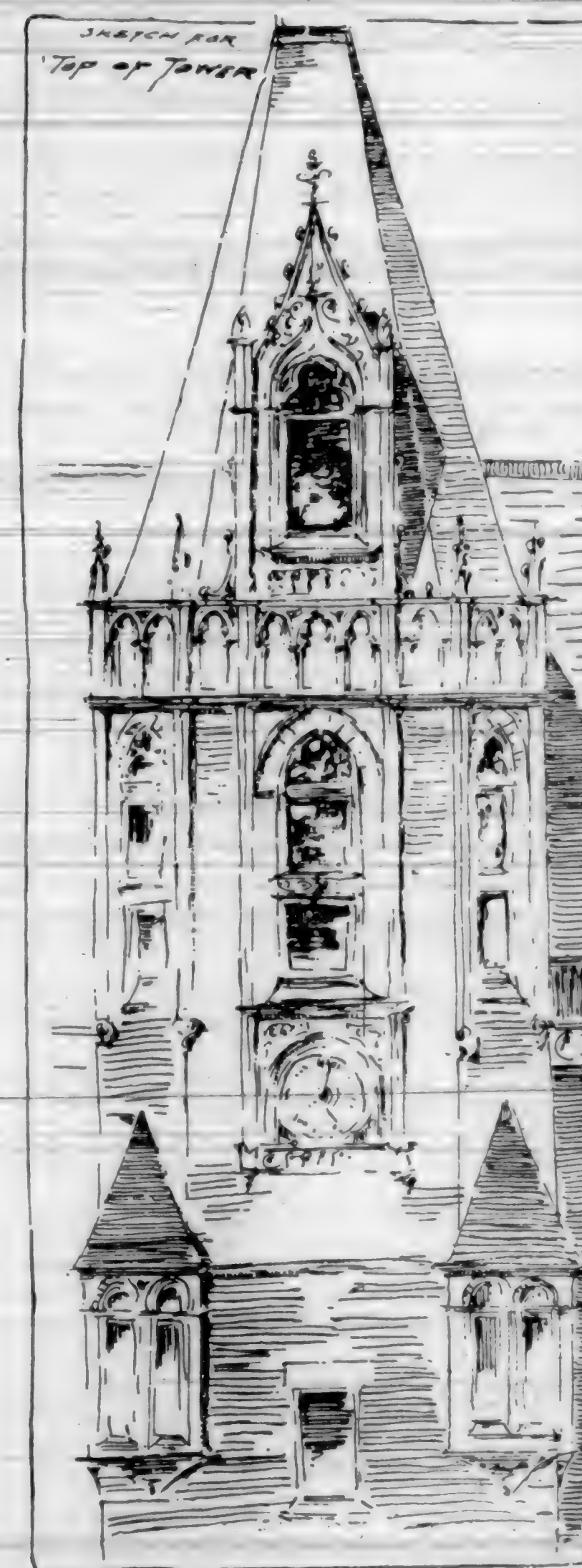
thickness of 1 1/2 inches; these are clamped to the end of beam *c* and to the beams of the girder by heavy bolts and nuts, holding all the beams as if in a vise.

The wrought iron plates being of increased strength compared to cast iron, permitted a considerable reduction in thickness, and were then of equal strength. This construction reduced the cost to nearly one-half of those of figure 7, and at a slight increase cost over the common deceptive as to strength of the kind described. These wrought iron plates are of considerable width, and extend over the top and bottom of the beams of the girder, be they one, two three or more beams (three are shown in the figure 8), and from their thickness and width are rigid against bending.

By this construction, none of the beams require drilling, punching, or other workmanship, but may be delivered direct from the Rolling Mill to the building or structure, and set in place, and the wrought iron plates and bolts are then readily adjusted. The end of the beam *c*, and also where the ends of the beams of the girder meet, is where they abut against each other, are so tightly clamped as to be immovable, a pulling force of tons makes no impression, requiring no fishplates to bind the ends of the beams together. In addition, the wedge pieces *u u* clamp the beams of the girder in a cross direction by forcing them over against the resisting bolts at the back. By this means the beams of the girder are clamped transversely as well as vertically.

Figure 1 shows the application to the best vault construction, in so far as it is all of wrought iron, and is of less depth and less cost than cast iron of equal strength.

P. H. JACKSON.





The Cogswell Technical School, San Francisco.

CHAS. GEDDES, Architect.

Dr. H. D. Cogswell and Caroline E. Cogswell on March 21, 1887, executed a trust deed, setting apart certain real property to establish and endow the Cogswell Polytechnic College. The trust deeds declare the object of the college is to give the boys and the girls of the state of California a practical training in the mechanical arts and other industries.

The college is not designed to teach trades, but to fully prepare the student to enter successfully upon any line of work. The aim is to fully develop the boy and the girl, mentally, morally and physically, thereby producing self-reliant and self-helpful men and women.

This college affords students an opportunity to continue their literary, scientific and mathematical studies and at the same time, to receive a thorough training in the industrial arts.

Dr. H. D. Cogswell thus describes the importance of manual training:

"The education that does not prepare one to intelligently direct his labor is not worthy of a moment's consideration. Most of our boys and girls have no occupation, and are not prepared, to intelligently learn one, when they leave school. They have a certain kind of learning, but no capacity for work. The new education, demanded by the necessities of the nineteenth century calls for the training of the eye and the hand, and stamps such a training as being just as important as the study of language, science or mathematics."

COURSE OF INSTRUCTION.

The course of instruction covers a period of four years. In addition to a thorough course in principles of construction and the literature of the various languages, applied mathematics, applied science, chemistry, phonography, telegraphy, and other branches, the following will show the advantages to be derived by students of the two sexes:

For boys only, a course in mechanical art, including free-hand

and mechanical drawing, carpentering, wood turning, wood carving, pattern making, iron turning, iron finishing, iron forging, iron moulding, copper and brass work, and a thorough course in the principles of machine construction.

For girls only, a course in industrial art, including clay moulding, drawing, designing, interior decoration, china painting, wood carving, metal work, plain and ornamental needle work.

THE OBJECTS OF THE SCHOOL

Are best told in the words of James G. Kennedy. "The theory on which the school is based is that education should correspond to the spirit of the people. That is, in an agricultural district it should be agricultural; in manufacturing and commercial districts it should pertain to manufacturing and to commerce, so that when a boy goes out he may have not only something to do, but be recognized as a superior workman, having intelligence outside of his practical knowledge of the use of tools. For boys we have first, a wood laboratory where they will learn to make all kinds of joints and everything else a carpenter can learn. Second, is an iron shop; third, a forging shop; fourth, a foundry; fifth, assaying laboratory.

"The girls learn first clay modeling—the basis for all kinds of modeling of brackets, chandeliers, etc. Second is drawing, third designing, fourth china painting, fifth *repose* work—hammering out brass, gold, silver and copperwork—sixth wood carving, seventh plain and ornamental sewing. Cooking may come later, but thus far no provision has been made for it. That is merely an outline of the manual work. Of course while the pupils are pursuing their course in handicraft, they are also learning English and either Latin, French, German or Spanish, applied mathematics, etc. We will teach on the principle that it does not take a boy as long to learn the principles of physics and chemistry while working at the bench as it does to

teach him the theory without the practice. We will waste no time on the study of English, but we will study English, spelling, grammar and rhetoric daily with our history or other subjects. It is my hobby that those branches which we use every time we read or talk or write should be inseparably interwoven into all other studies. It will be the teaching of the future. In future there will be no such thing as a separate hour devoted to spelling, one to grammar, one to composition, but all will come in with the study of history or any other branches wherein are to be found words and ideas new to the pupils. These boys will go hence with more sound practical English, grammar, higher mathematics, chemistry, physics (besides a trade they can follow) than any boy graduated from the San Francisco High School. Mind you, I don't say that when they begin they will be as rapid workmen as those who have devoted all their lives to work and work only. But after a little practice they will not only become as rapid in the accomplishment of their work but will be more valuable employees from their knowledge of the relationship their special work bears to other work in the shop. They will be superior in many other ways. I have spoken to leading founders and builders and they encourage me by promising to give the graduates of the college a fair trial after graduation. That is all I shall ask. I know that with but few exceptions the graduates of the Cogswell Polytechnic College will be acceptable in any industry they are taught."

The college buildings are on the southeast corner of Twenty-sixth and Folsom streets, and the main building faces on Twenty-sixth street. The lot fronts 245 feet on Folsom street and 182 feet on Twenty-sixth. The building is three stories in height and from its imposing and substantial appearance is the most notable structure in the southwestern portion of the city. It is seventy-one feet in width by eighty-five feet in depth, not including the projections. On each side is a wing two stories in height, each 35x40 feet. The building is surmounted with a metal roof with handsome cresting on the ridges. In front a high tower rises to the height of 127 feet, the apex topped with a revolving crystal star set in a copper pinnacle. On the face of the tower, above the third-story line, is the dial of a clock, and still lower down the name of the college. The main entrance is spacious and surrounded with a wide porch. On each side of the door is a niche for the placing of pieces of statuary. There are also two side entrances, one for boys and the other for girls. The main entrance porch is approached by a flight of stone steps. The main hallway is ten feet in width, and it opens into a cross-hallway twelve feet wide, which crosses the building from end to end. From the cross-hall stairways lead to the second story; stairs also lead to the stage at the rear and to the front of the assembly hall, in the story above. It will thus be seen that the means of egress are unusually excellent there being three wide doorways from the ground floor to the street and two from the second story to the assembly hall. There are to be ten classrooms, each 28x30 feet, four to be on the main floor and the other six to be on the second story. Two classrooms are already ready. On the first floor also are the offices of the President and Secretary, a reception parlor, a library 16x28 feet, and a museum 20x28 feet, besides a number of dressing and toilet rooms. A spacious assembly hall occupies the entire third story. It is 68x70 feet in size, and will have a seating capacity for 1,000. It will be used for the delivery of scientific and other lectures in connection with the regular courses of study in the school. This hall will eventually be handsomely furnished and provided with a stage, with all the necessary adjuncts for completeness. All the rooms are well lighted and every appliance known to modern skill is introduced to make ventilation perfect. They are lighted with electricity, and electric bells and speaking-tubes are run throughout the structure.

A short distance in the rear of the main edifice is another building in which the shops and laboratories are fitted up. It faces the north and is 152 feet in length by 40 feet wide and two stories in height. The ground floor is devoted exclusively to iron work, both designing and molding, having departments for filing, fitting and chipping. A laboratory is established in a room 35x40 feet and fitted with all the essentials for thorough instruction in polishing, fitting and setting up of various pieces and descriptions of machinery. A machine tool laboratory is 40x40 feet in size and completely equipped with iron laths, a drillpress, planers and rollers, by the aid of which pupils will be instructed in the arts of turning, drilling and planing iron so that they will be qualified to construct tools and small pieces of machinery. A forging furnace and laboratory have also been established and occupy a space 40x40 feet. The founding laboratory will be

35x40 feet in size, and contain a smelting furnace and other necessary appliances.

The second floor will be devoted to the chemical, wood and physical departments. The carpentry department is 40x35 feet, and supplied with an extensive assortment of tools. A wood-turning factory is 40x40 feet, and supplied with lathes, a planer, a circular-saw, a bandsaw, a mortise-machine, a mold and several other machines. The remaining space on the floor will be at the disposal of the physical and chemical departments. One room, 20x20 feet in size, is fitted up with shelving inclosed in a glass front, where all the philosophical apparatus will be kept that is used in experiments in chemistry and physical instruction. The furnaces in connection with this department are in the adjoining room, 40x50 feet in size.

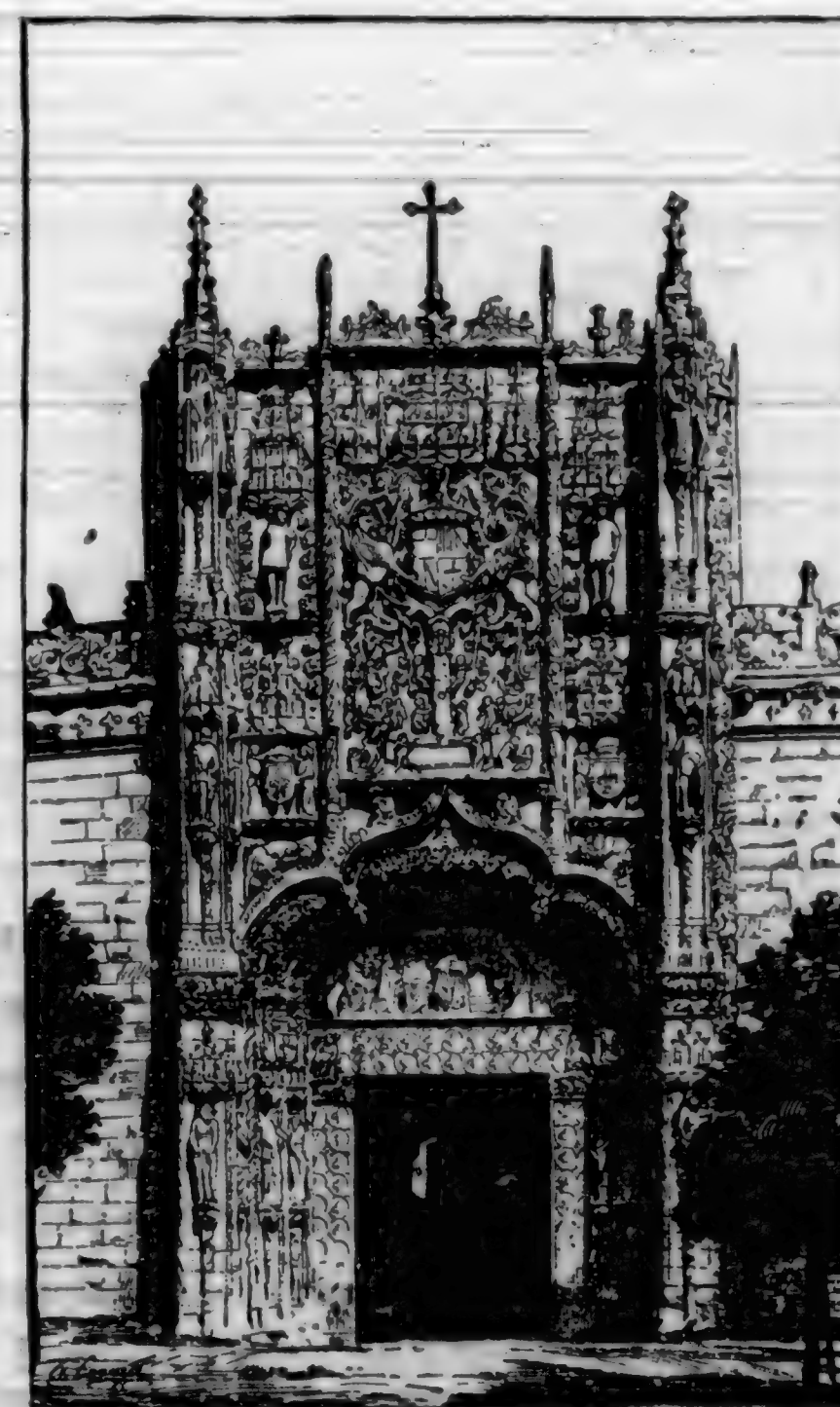
GIRLS' DEPARTMENT.

The department for instruction of girls will be fully as complete in detail as that for the boys. Here instruction will be given in wood and metal carving, sewing, cutting and fitting, as well as other mechanical studies. In the basement are well-lighted lunchrooms for the boys and girls; also rooms for the janitors and others who will reside permanently on the premises. There is also some additional space which may be utilized for classrooms or shops that may hereafter be required or found desirable. All the departments of machinery will receive motive power from a seventy-five horse power horizontal engine, which, together with the boilers, will be of the most approved pattern.

We intend to give the whole subject for which this college is founded, a thorough examination, and will report from time to time, the success, attending the efforts of those who are so nobly endeavoring to prepare the youth of both sexes to be worthy of the future government of the country's affairs.

CORPS OF TEACHERS.

The following named are those selected to preside over the various departments: James G. Kennedy, President; Mrs. Mary E. Arnold, Vice President and Superintendent of Girls' Department; Mr. A. T. Bruegel, M. E. Professor of Mathematics; Mr. Harold Howard, Professor of Modern Languages; Miss M. Van Vleck, M. I. A., Teacher of Industrial Art in Girls' Department; Miss Francis Hotchkisson, Teacher of English; Mr. J. M. Stockman, Teacher of Woodwork. Mr. G. A. Merrill, B. S., Prof. Sciences.



Good Hardware.

WE are pleased to notice an increased demand for good hardware for public buildings and residences on this coast. For the past few years there has been but little attention given to this feature of building—there being so little said in the specifications regarding it. The builder has had but little difficulty in finding locks, etc., good enough to meet the demands of his contract, his greatest difficulty has been to find them cheap enough, as for instance the architect specifies, "Mass face locks," the builder can buy them for \$3.00 to \$3.50 per dozen. Now any one with the average amount of common sense knows that 25 or 30 cents will not buy a lock fit to put into a door. Yet this has been one of the best markets in the United States for that class of house hardware. But property owners from past experience are becoming convinced of the importance of using a higher grade, not only of locks but of "Butts Knobs," and see that constitutes the interior hardware of a building and are treating it as they do any other feature of the structure by going personally and informing themselves in regard to the points of excellence and durability of the different styles and manufactures.

Dunham, Carrigan & Hayden Co. are taking the lead in the matter of urging the use of better goods. They have fitted up a "Bronze sample room," furnished in panels of polished woods representing the products of all parts of the world, particularly California. It would be difficult to find a more beautiful or extensive display of native woods than that which they have introduced into their room.

On these panels they have exhibited a complete line of Hopkins & Dickinson Manufacturing Co's newest designs of bronze hardware, the prominent styles "Colonial," "Grecian" rope molding, "Fluted," French" and "Italian Renaissance" are very handsome, and mark the best of an entirely new idea in the adaptation of interior hardware to the style of architecture and inside finish, harmony and contrast, as to color, size, shape, etc. All these are shown in "Bronze," "Oxidized Silver," "Antique Brass," "Steel," "Old Copper" and "Bower Barff."

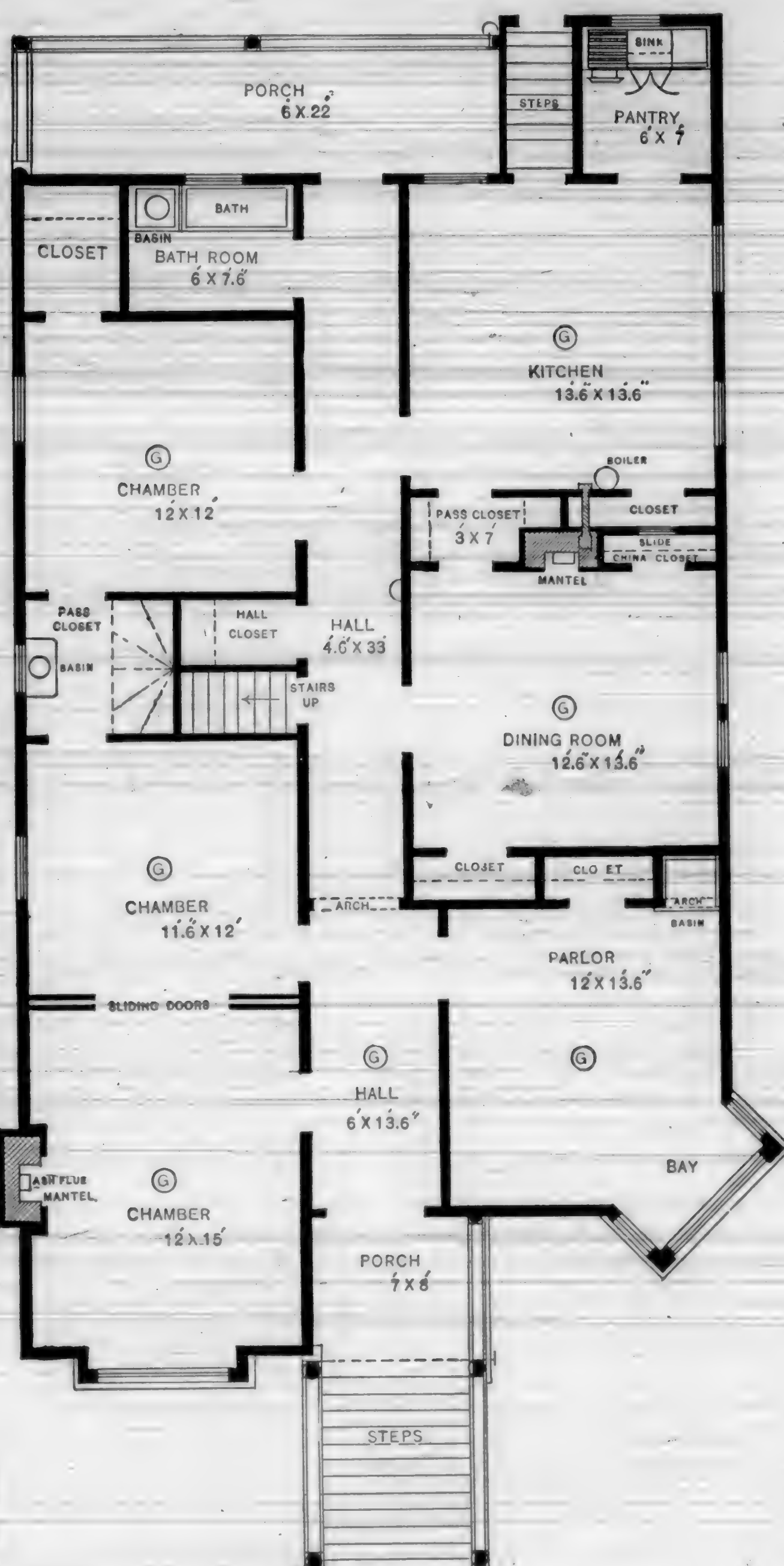
This room is fitted up extensively for the use of architects and builders who desire to take their patrons there and make selections or obtain ideas, and for those building or contemplating building. The room is always open to such, and so valuable an assistance as this to a proper choice of one of the most important features of building ought to be appreciated, and we are sure will.

Among the latest important inventions we notice Hopkins & Dickinson Manufacturing Co's new "office door cylinder locks," with the key above the knob, making key entrance easy. The key is very small and convenient to carry. These features, combined with the strength and durability of the lock, renders it most desirable for office buildings. Another fine thing is their new "hotel communicating door lock," hand made, and of the best quality.

Dunham, Carrigan & Hayden Co. cordially invite all who are interested in building to visit this department, assuring them that all specialties and novelties in their line will be exhibited in the most practical manner possible.

The Iron Age.

The paper read before the San Francisco Chapter, A. I. A., by G. H. Sanders, was ordered printed in full in the CALIFORNIA ARCHITECT. The utmost dispatch was used in preparing the engravings, but, although we delayed publication for a few days of this issue, we found it impossible to present the paper in the artistic manner desired. So, reluctantly, we are compelled to delay the printing the "Iron Age" until our next issue. It will be the best illustrated article that has ever appeared in this Journal.



Plan of "Rio Dell Cottage."

The MAY NUMBER of this Journal will be the best illustrated issue ever presented.

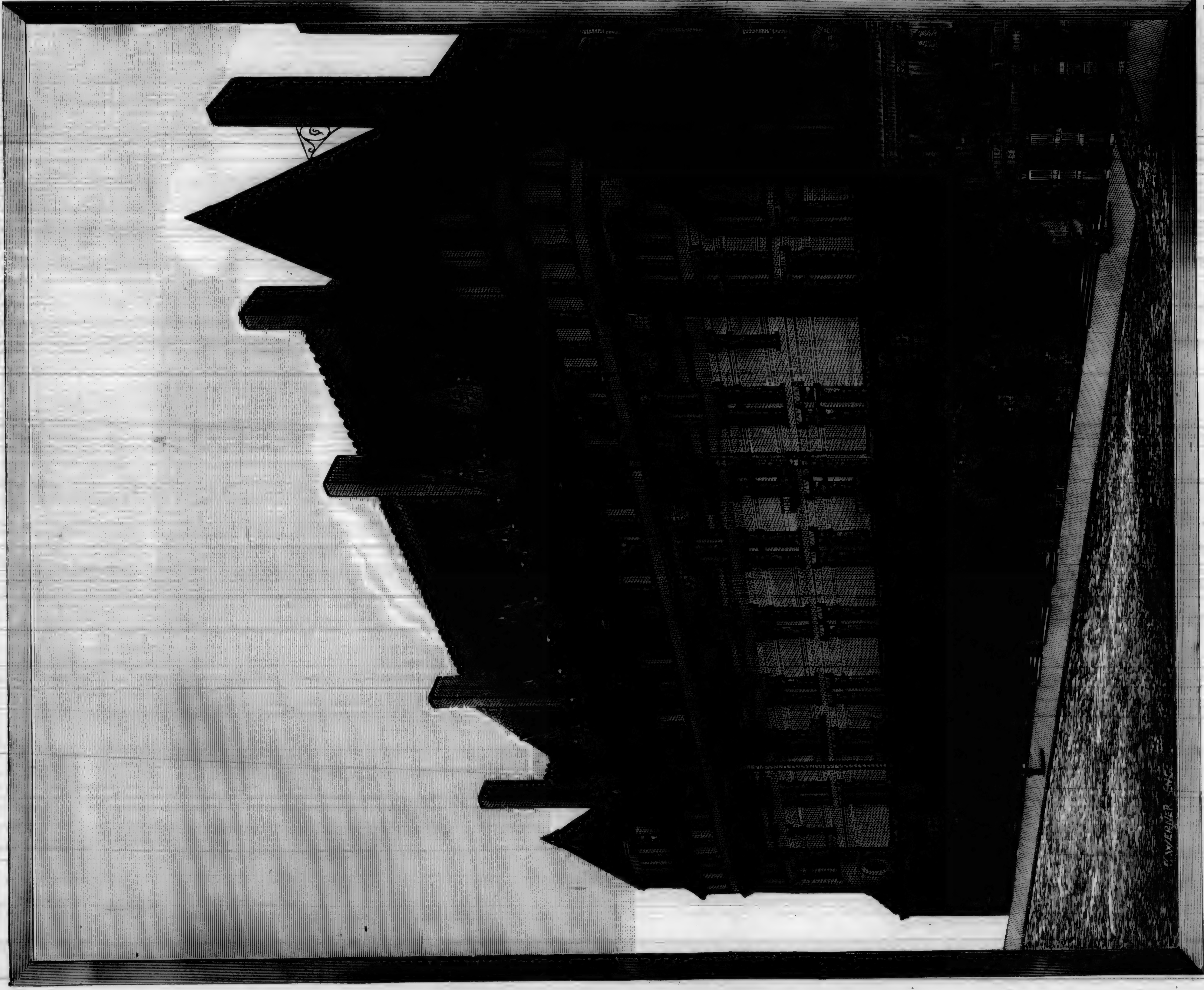
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Elevation and Details of "Rio Dell Cottage."

FOR PLAN, SEE INSIDE PAGE.



Engraved by G. Werner.

Size of Building—157x165.

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THE NEW CALIFORNIA THEATRE AND HOTEL.

Architect—J. M. WOOD, Chicago.

Owner, MRS. KATE M. McDONOUGH.

Terra Cotta Work furnished by GLADDING, McBEAN & CO.

Interior Wood Work furnished by KRELING & SONS.

Cut Stone furnished by O. E. BRADY

Electroliers furnished by California Gas Fixture Co.

Plaster Decorations furnished by KELLETT & McMURRAY.

"Roof" Boilers furnished by Geo. H. TAY & CO.

Plumbing Work by DAVID BUSH.

Decorations furnished by SPIERLING & LINDEN.

MATHER ELECTRIC CO. furnish the Electric Light Plant.

W. J. SLOANE & CO. supply the Carpets, Draperies and Furniture.

C. F. WEBER & CO. furnish Opera Chairs and Brass Work.

Wrought Iron Work by W. J. BRADY.

New Era in Redwood Lumbering.

AN experiment was tried at Balcom & Gibbard's Excelsior mill a short time ago, the result of which is certain to bring about a new era in the manufacture of redwood lumber. The subject of kiln-dried redwood for long shipments by rail has been a matter of discussion for a long time, and various projects, more or less expensive and extensive have been formulated, but not put to working test. The most practical idea heretofore was the maintenance of great lumberyards in the southern end of the state, where the lumber was to be season dried, but this incurred the keeping up of immense stocks, the cost of handling several times and consequent waste; but the project was never extensively entered into. The experiment we refer to will displace all former projects. For the requirements of their factory, Messrs. Balcom & Gibbard have set up a dryer, and a short time ago they placed in the dryer a thousand feet of redwood, fresh from the saw, some of it sawed from sunken logs, and turned on a blast of 220 degrees heat. The object was to test the resistance of redwood against checking by a high degree of heat. The blast was kept up 58 hours, and the lumber was taken out in 72 hours time, the brightest and cleanest redwood that was ever seen, without the slightest suspicion of a check. The lumber upon being placed in the dryer weighed 3,580 pounds, and upon coming out weighed 1,922 pounds, 1,658 pounds of moisture, or nearly one-half of the weight of lumber had been dried out in a little over two days, leaving the lumber in a perfect state as to brightness and grain. It is true that the practice of drying shingles for transportation has obtained for some time past, but now the movement toward kiln-dried lumber is likely to become general, and the operation will just about double the chances for railroad shipments, and the cost for drying is reckoned at from 50 cents to \$1.00 per 1,000 feet. The Excelsior Redwood Company has already received dryers, double and single, to the extent of nine rooms, which are to be set up at once, and which will be equal to nearly one-half the output of the mill. Other mills are following in the same line. Thus it being worked another revolution in the manufacture and shipment of redwood lumber which can never be applied to other timber in so successful a manner, for the same degree of heat applied to any other kind of lumber than redwood would check or warp it entirely out of recognition. This preparation of redwood will open to it many new avenues to profitable markets.—*Eureka Watchman.*

"PICTURESQUE CALIFORNIA HOMES."

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CITY BUILDING NEWS.

Alabama near Twenty-fifth alterations, for owner, Ed. F. Drew; architect, M. J. Welsh; cost, \$1,626; signed, March 6; filed, March 7; limit, 70 days; \$400 framed; \$400 brown coated; \$400 completed; \$426, 35 days.

Bluxome near Sixth, one-story brick warehouse. Owner, Thos. Magee; architect, Chas. I. Havens; contractor, Wm. M. Fletcher; cost, \$10,050; signed, March 4; filed, March 6; sureties, J. F. Kennedy; limit, 40 days; \$3,050 walls ready for rafters; \$4,000 completed; \$3,000, 35 days.

Buchanan and O'Farrell, three-story frame; Owner, Robt. Lorentz; architect, W. Winterhalter; contractors, Borstel and Conrad; cost, \$7,995; signed, March 1; filed, March 5; sureties, Chas. F. and Frank P. Doe; limit, 90 days; \$2,000 framed; \$1,995 roofed; \$2,000 completed; \$2,000, 35 days.

Broderick near Hayes, two-story frame. Owner, Nancy C. Lehman; architect, Geo. Houston; contractor, Geo. Houston; cost, \$3,000; signed, Feb. 27; filed, March 4; limit, 100 days; \$750 shingles on; \$750 brown coated; \$750 doors and windows in; \$750, 35 days.

Broadway near Leavenworth, tenement; owner, Bridget Fitzgerald; architect, Sam'l. Newsom; contractor, John Doherty; cost, \$2,500; signed, March 19; filed, March 20;

\$375 framed; \$375 roofed; \$375 white mortar; \$375 outside primed; \$375 completed; \$625, 35 days.

Broderick, near Washington, two-story and basement, frame. Owner, R. W. Hill, architects, Percy & Hamilton, contractor, R. O. Chandler, amount, \$5,079, signed, March 18, filed, March 25, limit, 90 days, first Saturday of each month 75 per cent. of value of work done, balance, 25 per cent., 35 days.

Broadway near Pierce, two-story frame. Owner, Fred. E. Sharkey; architects, J. J. and T. D. Newsom; contractor, A. E. Aldridge; cost, \$3,500; signed, March 6; filed, March 9; sureties, Harry Downey, John Felix and F. C. Eisen; \$1,000 limit, 110 days; \$500 framed; \$800 outside work done; \$600 plastered; \$655 completed; \$895, 36 days.

San Francisco Will Manufacture Saw Mill Machinery.

The "Vulcan" Foundry of this city is enlarging its base of operations and is reaching out to control its share of the manufacture of lumber machinery.

The Sanhedrin Mill & Lumber Company have recently contracted with the Vulcan Iron Works for the machinery for their new saw mill to cut about 50,000 feet of lumber per day; and have also selected a 60-inch heavy "Vulcan" Gang Edger, a set of heavy "Vulcan" Fractional Screw Head Blocks, also an 8x10, "Campbell" Steam Feed.

There is no reason why the "Vulcan" and the other foundries, should not absolutely control the manufacture of saw mill machinery on this coast. We propose to do what we can to this end

"From East to West."

We have received from Samuel Cabot of Boston, a copy of his book of sketches as above entitled. It contains beautiful designs of architecture as exemplified principally by New York and Boston talent. The names are given on each sketch shown, and certainly they embrace those who stand at the head of their profession. All the houses shown have been actually stained with creosote stains, manufactured by Mr. Cabot. The effect is very pleasing. Mr. Cabot proposes to thoroughly introduce these stains on this coast and has appointed T. J. Bass & Co. as his agents. Mr. Cabot proposes to print new editions of this work every few months and we can safely say that California will be represented in the next edition.

To stain brick red, melt one ounce of glue in a gallon of water; then add a piece of alum as large as an egg, one-half pound of Venetian red and one pound of Spanish brown; redness or darkness is increased by using more red or brown. For coloring black, heat the brick and dip in fluid asphaltum or in hot linseed oil and asphalt.

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Broderick, near Fourteenth, frame. Owner, E. G. Cook; architect, John Marquis; contractor, Richard Mowry; amount, \$4,500; signed, March 26; filed March 29; \$843 chimneys up; \$843 ready to lay; \$843 outside finish on; \$843 completed; \$1,128, 35 days.

Block 595, Western Addition, fence, grand stand, band stand. Owner, John F. Bragg; contractor, Alex J. Wheeler; amount, \$2,700; sureties, Lewis B. Haines and Frank Gardiner; signed, March 28; filed, March 30; limit, April 15, '89; April 6, '89, \$75; April 13, '89, \$675; April 16, '89, \$675; May 16, '89, \$675.

California near Larkin, carpenter work for three-story frame. Owner, C. Franzoe; architect, Wm. Mooser; contractor, G. Damkroeger; cost, \$3,875; signed, March 15; filed, March 16; sureties, H. Mattern and W. J. Trott; \$2,000; limit, 90 days; 75 per cent. of work done, balance 25 per cent. 35 days after.

Castro, north of Fifteenth, two-story frame. Owner, Wm. Buescher; architect, Bernard Dreyer; contractor, Bernard Dreyer; cost, \$3,705; signed, April 1; filed, April 3; limit, June 20, '89; \$926 25 framed; \$926 25 brown mortared; \$926 25 white mortared; \$926 25, 35 days.

Clinton, near Bryant, alterations, etc. Owner, Mrs. F. P. Perry; architect, John J. Clark; contractor, J. McCarthy; amount, \$2,675; sureties, Blythe and Trott and John Coop; limit, 60 days; \$600 enclosed; \$600 brown mortared; \$600 inside finished; \$875, 35 days.

California and Front, artificial stone work. Owner, Moses Rosenbaum; architects, Salfeld & Kohlberg; contractor, Geo. Goodman; cost, \$1,425; signed March 1; filed March 7; sureties, Jno. J. Mahoney and Calvin Nutting \$1,425; limit without delay; 75 per cent. as work progresses; balance 35 days.

Devisadero near Washington, plumbing. Owner, Mrs. M. A. Rainey; architect, T. J. Welsh; contractors, Fritz & Kean; cost, \$1,350; signed, March 4; filed, March 5; \$475 rough if finished; \$475 finished; 400, 35 days.

Devisadero near Washington, four frames. Owner, Mrs. M. A. Rainey; architect, T. J. Welsh; contractor, John Blake; cost, \$14,284; signed, Feb. 26; filed, March 5; limit, 90 days; \$2,500 first story joists up; \$2,500 framed; \$2,200 brown mortared; \$1,250 white mortared; \$1,250 completed; \$4,284, 35 days.

Dale Place, near Golden Gate Avenue, three-story frame. Owner, C. T. A. Langerman; architect, A. J. Barnett; contractors, C. N. Smith and Wm. J. Simon; cost, \$3,358; signed, March 12; filed, March 15; sureties, Wm. Simon, \$2,000; limit, 90 days; \$800 roof boards on; \$850 front finish on; \$868 completed; \$840, 35 days.

Devisadero, between Hayes and Fell, two-story double flat. Owner, A. L. Edwards; architects, J. C. Matthews & Son; contractors, Maloney & Shay; cost, \$3,953; signed, March 11; filed, March 14; limit, June 1, '89; 75 per cent. from time to time as work progresses; balance, 30 days after.

Devisadero near Hayes, two-story frame. Owner, Jas. Weber; architect, M. J. Welsh; contractor, J. H. McKay; cost, \$3,840; signed, March 18; filed, March 20; \$960 framed; \$960 brown mortared; \$960 finished; \$960, 35 days.

Devisadero near Ridley, two-story frame. Owner, Marion O. Hall; architects, Hueme & Everett; contractor, John Martin; cost, \$3,825; signed, March 20; filed, March 21; sureties, Frank P. Latson and Jas. A. Weson, \$3,825; \$956.25 sheathed roof; \$956.25 brown mortared; \$956.25 completed; \$956.25, 35 days.

Dolores, between Fifteenth and Sixteenth, two-story frame. Owner, J. M. Peoples; contractor, Geo. Houston; cost, \$3,123; signed, March 27; filed, April 2; \$775 shingled; \$775 brown mortared; \$775 windows in place; \$798, 35 days.

Dupont, north of San Francisco, two-story frame. Owner, L. Malatesta; architect, Wm. Mooser; contractor, E. Idalgiero; cost, \$3,170; signed, March 30; filed, April 5; sureties, J. Peralto and D. Perrago, \$1,600; limit, 75 days; 75 per cent. as work is done; balance, 25 per cent. 35 days.

Ellis and Jones, plumbing. Owner, Mrs. A. E. Luhrs; architects, Pissis & Moore; contractors, Sweeney & Kearns; cost, \$1,100; signed, March 7; filed, March 8; \$400 rough work done; \$425 completed; \$275, 35 days.

Ellis and Jones, additions, etc. Owner, Mrs. A. E. Luhrs; architects, Pissis & Moore; contractors, Moore Bros.; cost, \$10,900; signed, March 7; filed, March 8; \$1,500 foundations up; \$1,500 framed; \$1,500 first plaster; \$1,500 interior plastered; \$1,500 ready to paint; \$500 accepted; \$2,900, 35 days.

Eddy and Laguna, two-story frame. Owner, August Koerber; architect, H. Geilfuss; contractors, Von Borstel & Conrad; cost, \$4,695; signed, March 20; filed, March 23; limit, 80 days; \$820 framed; \$900 partitions set; \$900 white coated; \$900 completed; \$1,175, 35 days.

Erle, south of Mission, three two-story frames. Owner, Wm. Ede; architect, A. J. Barnett; contractor, O. E. White; cost, \$5,000; signed, March 28; filed, April 4; surety, Chas. F. Doe, \$3,000; limit, three months after foundation walls are completed; \$1,500 main roof on; \$1,500, outside finish on; \$1,500, completed; \$1,500, 35 days.

Fair Oaks, south of Twenty-second, building. Owner, L. J. Evans; architect, S. Hatfield; contractor, P. F. Lynch; cost, \$4,418; signed, April 1; filed, April 2; surety, W. J. Adams \$3,000; limit, 70 days; \$913 50, roof on; \$800 floors laid; \$800, plastering finished; \$800, completed; \$1,105 50, 35 days.

Front, corner California, painting. Owner, Moses Rosenbaum; architect, Salfeld & Kohlberg; contractor, J. F. Sullivan; cost, \$840; signed, March 1; filed, April 4; sureties, Thos. Winters and P. M. Wellon \$840. 75 per cent. as work progresses, in monthly payments; balance, 25 per cent., 35 days.

Front, corner California, terra cotta work. Owner, Moses Rosenbaum; architect, Salfeld & Kohlberg; contractors, Gladding, McBean & Co.; cost \$750; signed, March 9; filed, April 4; limit, without delay; 75 per cent. as work progresses; balance, 25 per cent., 35 days.

Front and California, glazing, etc. Owner, Moses Rosenbaum; architects, Salfeld & Kohlberg; contractors, P. H. Rosenbaum & Co.; cost, \$2,125; signed, March 6; filed, March 7; limit without delay; 75 per cent. when glass is set and accepted; balance 25 per cent. 35 days.

Front and California, plastering. Owner, Moses Rosenbaum; architects, Salfeld & Kohlberg; contractor, C. C. Moorehouse; cost, \$2,340; signed, March 1; filed, March 7; sureties, John Tuttle, \$2,340; limit without delay; \$1,150 brown coated, \$600 accepted; \$590, 35 days.

Front and California, sewerage and plumbing. Owner, Moses Rosenbaum; architects, Salfeld & Kohlberg; contractors, Fritz & Kean; cost, \$2,000; signed, March 1; filed, March 7; limit without delay; \$1,000 rough plumbing in; \$500 accepted; \$500, 35 days.

Front and California, galvanized iron and tinning. Owner, Moses Rosenbaum; architects, Salfeld & Kohlberg; contractor, Jos. Forde; cost, \$1,125; signed, March 1; filed, March 7; 75 per cent. of work progresses; balance, 35 days.

Front and California, cast and wrought iron work. Owner, Moses Rosenbaum; architects, Salfeld & Kohlberg; contractors, Phoenix Iron Works; cost, \$2,110; signed, March 1; filed, March 7; limit without delay; 75 per cent. as work progresses; balance, 25 per cent. 35 days.

Front and California, cut stone work. Owner, Moses Rosenbaum; architects, Salfeld & Kohlberg; contractors, McGowan & Butler, et al; cost, \$12,750; signed, March 6; filed, March 7; sureties, C. A. Warren and C. S. Holmes \$12,750; limit without delay; 75 per cent. as work progresses; balance 35 days; payments on 1st of each month.

Front and California, carpenter work. Owner, Moses Rosenbaum; architects, Salfeld & Kohlberg; contractor, A. Jackson; cost, \$10,000; signed, Feb. 28; filed, March 7; sureties, Chas. & Frank P. Doe \$10,500; 75 per cent. as work progresses on 1st of each month; balance 25 per cent., 35 days.

Front and California, moving old building and brick work for new one. Owner, Moses Rosenbaum; architects, Salfeld & Kohlberg; contractor, John McCarthy; cost, \$13,475; signed, Feb. 2; filed, March 7; sureties, Richard J. McCann and Thos. C. Riddell \$13,275; limit, 100 days; 75 per cent. on completion of each story; 25 per cent., 35 days.

Fillmore and Germania, two-story frames. Owner, Mrs. A. C. Stohlmann; architect, E. John; contractors, Von Borstel & Conrad; cost, \$4,794; signed, March 15; filed, March 18; \$1,000 framed; \$1,500 rough mortared; \$1,095.50 accepted; \$1,198.50, 35 days.

Fell and Broderick, two-story and basement frame. Owner, B. E. Henriksen; architect, B. E. Henriksen; contractor, Robt. Currie; cost, \$5,600; signed, March 21; filed, March 21; \$1,050 roofed; \$1,050 brown coated; \$1,050 white coated; \$1,050 trimmings on; \$1,400, 35 days.

Golden Gate Avenue, near Lyon, frame dwelling. Owner, Mac C. Madden; architect, T. J. Welsh; contractor, C. E. Dunshie; cost, \$3,800; signed, March 13; filed, March 14; limit, 90 days; \$315 framed; \$2,000 white coated; \$500 completed; \$985, 35 days after.

Golden Gate Avenue near Jones, alterations in four brick buildings now being erected. Owner, Lizzie W. Moffat; architect, Chas. I. Havens; contractor, Chas. C. Terril; cost, \$10,667.50; signed, March 16; filed, March 18; installments on 15th of each month in sums of 75 per cent., balance, 35 days.

Howard, near Twentieth, building. Owner, Sarah Miller; architect, T. J. Welsh; contractor, James McInerney; amount, \$5,195; surety, J. J. McKinnon \$3,000; signed, March 26; filed, March 29; limit, 90 days; \$974 framed; \$974 brown mortared; \$974 white mortared; \$974 finished; \$1,299, 35 days.

Howard, corner Mary, building. Owner, James L. Fallon; architect, John J. Clark; contractor, John G. Adams; amount, \$7,950; sureties, E. W. Hannon and Fabian Joost; \$7,000; signed, March 5; filed, March 28; limit, 100 days; \$1,986 framed; \$1,980 brown mortared; \$1,980 inside finished; \$2,010, 35 days.

Hayes, near Broderick, building. Owner, C. B. Hawley; architect, Charles I. Havens; contractor, Dan Chisholm; amount, \$7,799; signed, March 25; filed, March 28; \$1,299 enclosed; \$1,500 brown mortared; \$1,500 hard finished; \$1,500 completed; \$2,000, 35 days.

Hermann, near Jessie, three-story frame. Owner, Christina Miller; architect, A. J. Barnett; contractor, Brennan Bros.; amount, \$5,660; sureties, J. J. McKinnon and D. J. Preston, \$3,000; signed, March 25; filed, March 28; limit, 100 days; \$1,160 roof on; \$1,000 brown mortared; \$1,000 outside finished; \$1,000 completed; \$1,500, 35 days.

Howard and East, foundation for road bed. Owners, Omnibus Cable Co; architect, Engineer of Co; cost, \$2,050; signed, March 8; filed, March 11; limit, 30 days; 75 per cent. as work progresses; balance 25 per cent., 35 days after.

Henry near Noe, building. Owner, P. Conlin; architect, T. J. Welsh; contractor, James McInerney; cost, \$2,000; signed, March 11; filed, March 15; sureties, P. F. Ward and J. J. McKinnon, \$1,500; \$500 framed; \$500 brown mortared; \$500 completed; \$500, 35 days after.

Haight, between Steiner and Pierce, three-story frame. Owner, August Kenerleber, et al; architect, R. Zimmermann; contractor, Adam Miller; cost, \$5,100; signed, March 2; filed, March 19; \$1,000 framed; \$1,000 enclosed; \$1,000 rough mortared; \$1,000 completed; \$1,100, 35 days.

Haight near Gough, addition for a market. Owner, A. P. Hotaling; architect, Wm. Mooser; contractors, Norton & Perry; cost, \$3,250; signed, March 21; filed, March 23; limit, 70 days; 75 per cent. as work progresses; balance 25 per cent., 35 days.

Howard, Nos. 1713, 1715, 1719, brick foundations. Owner, James Phelan; architect, Jno. Marquis; contractor, Martin Fennel; cost, \$1,845; signed, March 23; filed, March 23; limit, 50 days; \$354 No. 1719, finished; \$343, 1717 finished; \$343, 1715 finished; \$343, 1713 finished; \$452, 35 days.

Henry near Sanchez, two-story frame. Owner, Henry Harms; architect, J. E. Kraft; contractor, J. W. Smith; cost, \$3,157; signed, March 6; filed, March 9; limit, 70 days; \$750 enclosed; \$750 brown mortared; \$857 completed; \$800, 35 days.

Hayes near Gough, building. Owner, Philip Pasener; architects, Salfeld & Kohlberg; contractors, Martin & Maguire; cost, \$6,000; signed, March 15, filed, March 18; sureties, Frank P. Latson and J. W. Welsh \$6,000; limit, 100 days; \$1,000 framed; \$1,000 brown mortared; \$1,000 inside finished; \$1,500 accepted; \$1,500, 35 days.

Hayes near Buchanan, two-flats. Owners, John Boyd and wife; architects, Donovan & Williams; contractors, Donovan & Williams; cost, \$4,625; signed, Feb. 26; filed, March 7; sureties, Preston & McKinnon, \$2,000; limit, July 1, '89; \$1,000 enclosed; \$800 brown coated; \$600 white coated; \$1,025 completed; \$1,200, 35 days.

Haight, west of Steiner, two-story frame. Owner, Jos. Boek; architect, A. J. Barnett; contractor, Rountree Bros.; cost, \$6,700; signed, April 2; filed, April 4; sureties, Behrend Joost and W. A. Meeker \$3,500; limit, 100 days; \$1,525, roofed; \$1,000 brown coated; \$1,500 white coated; \$1,000, completed; \$1,675, 35 days.

Haight corner of Laguna, two-story frame. Owner, Gustave F. Schmidt and wife; architect, Wm. T. Commary; contractor, Wm. T. Commary; cost, \$7,870; signed, April 1; filed, April 5; \$1,900, framed; \$1,400, sashes fitted; \$1,400, basement done; \$1,042, ready to paint; \$360, completed; \$1,968, 35 days.

Howard, north of Fifteenth, three story frame. Owner, F. G. Gerhardt; architect, Henry Geilfuss; contractor, H. J. Weiss; cost, \$3,857; signed, April 4; filed, April 6; \$600, roofed; \$600 partitions set; \$657, completed; \$2,000, 35 days.

Haight, between Scott and Devisadero, two-story frame. Owner, Jos. M. Kane; architects, Schmidt & Shea; contractor, Wm. Plums; cost, \$4,700; signed, April 4; filed, April 6; sureties, F. and B. Joost; \$800 rustic on; \$900 rough plumbing in; \$900 hard finished; 900 completed; \$1,200, 35 days.

Jackson, corner Broderick, carpenter work. Owner, J. Dupuy; architect, Wm. Mooser; contractor, M. C. Lynch; cost, \$3,500; signed, April 3; filed, April 4; sureties, John Lewis and P. Swift; \$2,000; \$2,000 third story joists laid; \$2,000 iron work on; \$2,000 yard work finished; \$2,098 ready to paint; \$2,700, 35 days.

Jackson, near Webster, brick and carpenter work. Owner, Carl Walliser; architect, Wm. Mooser; contractor, Geo. J. Doering; amount, \$3,083; signed, March 23, filed March 25; limit, 100 days; 75 per cent. as work progresses, balance, San Jose and vicinity. [From our Special Correspondent.] 25 per cent., 35 days.

Jackson, near Laguna, building. Owner, Mrs. W. F. DeForest; architect, Samuel Newson; contractor, George R. Lang; cost, \$5,650; signed, March 18; filed, March 20; \$350 framed; \$500 roofed; \$1,000 white mortared; \$1,000 outside primed; \$1,200 completed; \$1,600, 35 days.

Laguna and Washington, building. Owner, Matilda L. Castle; architect, W. J. Mathews; contractors, Knight & Littlefield; cost, \$10,194; signed, March 6; filed, March 19; limit, July 10, '89; 75 per cent. as work progresses, balance 25 per cent. 35 days.

Laussat, between Fillmore and Steiner, two-story building. Owner, M. McIntyre; architect, Wm. Mooser; contractor, D. Chisholm; cost, \$2,000; signed, March 11; filed, March 13; sureties, F. Joost; limit, 60 days; 75 per cent. in proportion to work done, balance, 25 per cent., 35 days after.

Leavenworth near Clay, three-story frame. Owner, Isaac L. Hofmann; architects, C. R. & J. M. Wilson; contractor, F. V. Steinman; cost, \$8,400; signed, March 7; filed, March 7; \$2,000 framed; \$1,000 enclosed; \$1,000 brown coated; \$1,000 white coated; \$1,300 completed; \$2,100, 35 days.

Lafayette, south of Miuna, three-story frame. Owner, Jos. A. Cruz; architect, H. Geilfuss; contractor, John Foster; cost, \$5,500; signed, March 19; filed April 5; sureties, John Smith and Wm. Swift, \$3,000; \$1,100 framed; \$1,000 brown coated; \$1,000 white coated; \$1,000 completed; \$1,400, 35 days.

McAllister near Lyon, building. Owner, F. P. Adams; architect, B. E. Henriksen; contractor, Louis Helbing; cost, \$4,100; signed, March 21; filed, March 21; \$768 roofed; \$769, brown coated; \$769 white coated; \$769 trimmings on; \$1,025, 35 days.

Market, northeast City Hall avenue, plumbing. Owner, Margaret Lynch; architect, Jas. E. Wolfe; contractor, E. Wolfe; cost, \$1,040; signed, March 22; filed, April 2; 75 per cent. as work progresses; balance, 25 per cent., 35 days.

Market, northeast City Hall avenue, plumbing. Owner, C. G. Burnett; architect, Jas. E. Wolfe; contractor, E. Wolfe; cost, \$1,875; signed, March 22; filed, April 2; 75 per cent. as work progresses; balance, 25 per cent., 35 days.

McAllister, east Scott, two-story frame. Owner, H. W. Frank; architect, Charles I. Havens; contractor, John G. Adams; cost, \$5,725; signed, April 2; filed, April 3; \$1,000 enclosed; \$1,000 brown coated; \$1,000 hard finished; \$1,225 completed; \$1,500, 35 days.

Market, between Sixth and Seventh, elevator work for foundation. Owner, Joseph Rosenthal; architects, Salfeld & Kohlberg; contractors, Wm. H. Birch & Co.; cost, \$5,300; signed, January 28; filed, April 4; 40 per cent. of work accomplished at end of each month; balance, 35 days.

Ninth and Harrison, three-story frame. Owner, Michael Bohanan; architect, T. J. Welsh; contractor, James F. Logan; cost, \$5,387; signed, March 8; filed, March 11; limit, 90 days; \$996 framed; \$996 brown mortared; \$996 white mortared; \$999 finished; \$1,400, 35 days.

No. 2615 California street, additions. Owner, E. A. Selfridge; architects, Schulze & Meeker; contractor, Wm. Winnie; cost, \$2,270; signed, March 28; filed, April 1; sureties, Nathan Rosenberg and V. Z. Horton, \$750; limit, June 15, '89; \$900 roofed; \$802 completed; \$568, 35 days.

No. 1516, Twenty-Fourth, alterations. Owner, Susie Solomon; architect, James H. Humphreys; contractors, Lehnhard & Jeffrey; cost, \$1,900; signed, March 2; filed, March 5; sureties, Isidore Asch and Niehaus Bros. & Co. \$1,900; limit, May 2, '89; \$475 floors laid; \$475 brown coated; \$475 completed; \$475; 35 days.

O'Farrell, corner Buchanan, painting. Owner, Robert Lorentz; architect, W. Winterhalter; contractor, Frederick Schaefer; amount, \$680; signed, March 23; filed, March 29; limit, 12 days; \$180 outside two coats and roof, one coat; \$320 completed; \$180, 35 days.

O'Farrell and Leavenworth, alterations, etc. Owner, Wm. Schehr; contractor, G. W. Hansbrough; cost, \$4,200; signed, March 8; filed, March 9; sureties, W. Edwards and Jno. F. Taylor; \$1,000 framed; \$1,000 brown mortar; \$1,000 white mortar; \$1,200 completed; \$1,375, 35 days.

Page, near Fillmore, brick and carpenter work. Owner, J. G. Bloomer; architect, James E. Wolfe; contractor, John J. Dunn; amount, \$3,772, surety, C. S. Holmes, \$1,000; signed, March 21, filed, March 28, \$820 framed, \$720 brown mortared, \$720 standing finish; \$569 completed, \$943, 35 days.

Pine near Baker, one-story frame. Owner, S. P. Taylor and wife; architect, G. G. Gillespie; contractor, G. G. Gillespie; cost, \$2,400; signed, March 4; filed, March 6; \$450 framed, \$450 brown coated; \$450 white coated; \$450 completed; \$600, 35 days.

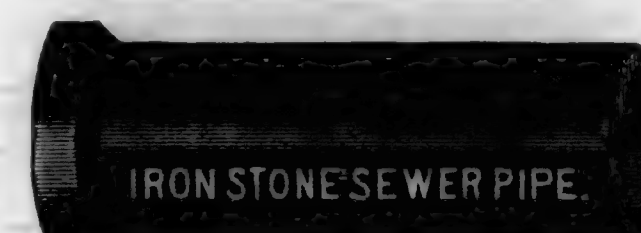
Post, between Hyde and Larkin, brick and carpenter work. Owner, Bernard Miller; architects, Salfeld & Kohlberg; contractors, Fuchs & Bucher; cost, \$8,494; signed, March 12; filed, March 18; sureties, G. H. Woerz and M. Schwab, \$8,494; limit, 100 days; \$1,500 framed; \$1,000 roofed; \$1,500 brown mortar; \$1,000 doors hung; \$1,344 accepted; \$2,150, 35 days.

Post, between Hyde and Larkin, plumbing, etc. Owner, Bernard Miller; architects, Salfeld & Kohlberg; contractors, Sam'l. Inkelheimer & Bro.; cost, \$657; signed, March 12; filed, March 18; \$300 when rough work is done; \$375, 35 days after.

Pine, east Lyon, building. Owner, Anna R. McPhee; architect, S. Hatfield; contractor, Allan McDonald; cost, \$3,785; signed, March 30; filed April 2; sureties, Frank P. Latson and J. J. McKinnon \$2,500; limit, 60 days; \$800 roof on; \$679 first coat of mortar on, etc.; \$679 windows in; \$680 completed; \$947, 35 days.

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Broderick, near Fourteenth, frame. Owner, E. G. Cook; architect, John Marquis; contractor, Richard Mowry; amount, \$4,500; signed, March 26; filed March 29; \$843 chimneys up; \$843 ready to lath; \$843 outside finish on; \$843 completed; \$1,128, 35 days.

Block 595, Western Addition, fence, grand stand, band stand. Owner, John F. Bragg; contractor, Alex J. Wheeler; amount, \$2,700; sureties, Lewis B. Haines and Frank Gardiner; signed, March 28; filed, March 30; limit, April 15, '89; April 6, '89, \$75; April 13, '89, \$675; April 16, '89, \$675; May 16, '89, \$675.

California near Larkin, carpenter work for three-story frame. Owner, C. Franzoe; architect, Wm. Mooser; contractor, G. Danckroeger; cost, \$3,875; signed, March 15; filed, March 16; sureties, H. Matern and W. J. Trott; \$2,000 limit, 90 days; 75 per cent. of work done, balance 25 per cent. 35 days after.

Castro, north of Fifteenth, two-story frame. Owner, Wm. Buescher; architect, Bernard Dreyer; contractor, Bernard Dreyer; cost, \$3,705; signed, April 1; filed, April 3; limit, June 20, '89; \$926 25 framed; \$926 25 brown mortared; \$926 25 white mortared; \$926 25, 35 days.

Clinton, near Bryant, alterations, etc. Owner, Mrs. F. P. Perry; architect, John J. Clark; contractor, J. McCarthy; amount, \$2,675; sureties, Blythe and Trott and John Coop; \$2,600; signed, March 29; filed March 30; limit, 60 days; \$600 enclosed; \$600 brown mortared; \$600 inside finished; \$875, 35 days.

California and front, artificial stone work. Owner, Moses Rosenbaum; architects, Salfeld & Kohlberg; contractor, Geo. Goodman; cost, \$1,425; signed, March 1; filed March 7; sureties, Jno. J. Mahoney and Calvin Nutting; \$1,425; limit without delay; 75 per cent. as work progresses; balance 35 days.

Devisadero near Washington, plumbing. Owner, Mrs. M. A. Rainey; architect, T. J. Welsh; contractors, Fritz & Kean; cost, \$1,350; signed, March 4; filed, March 5; \$475 rough if finished; \$475 finished; 400, 35 days.

Devisadero near Washington, four frames. Owner, Mrs. M. A. Rainey; architect, T. J. Welsh; contractor, John Blake; cost, \$14,284; signed, Feb. 26; filed, March 5; limit, 90 days; \$2,500 first story joists up; \$2,500 framed; \$2,200 brown mortar; \$1,250 white mortar; \$1,250 completed; \$4,284, 35 days.

Dale Place, near Golden Gate Avenue, three-story frame. Owner, C. T. A. Langerman; architect, A. J. Barnett; contractors, C. N. Smith and Wm. J. Simon; cost, \$3,358; signed, March 12; filed, March 15; sureties, Wm. Simon, \$2,000; limit, 90 days; \$800 roof boards on; \$850 front finish on; \$868 completed; \$840, 35 days.

Devisadero, between Hayes and Fell, two-story double flat. Owner, A. L. Edwards; architects, J. C. Matthews & Son; contractors, Maloney & Shay; cost, \$3,953; signed, March 11; filed, March 14; limit, June 1, '89; 75 per cent. from time to time as work progresses, balance, 30 days after.

Devisadero near Hayes, two-story frame. Owner, Jas. Weber; architect, M. J. Welsh; contractor, J. H. McKay; cost, \$3,840; signed, March 18; filed, March 20; \$960 framed; \$960 brown mortar; \$960 finished; \$960, 35 days.

Devisadero near Ridley, two-story frame. Owner, Marion O. Hall; architects, Huene & Everett; contractor, John Martin; cost, \$3,825; signed, March 20; filed, March 21; sureties, Frank P. Latson and J. A. W. Weston, \$3,825; \$956.25 sheathed roof; \$956.25 brown mortar; \$956.25 completed; \$956.25, 35 days.

Dolores, between Fifteenth and Sixteenth, two-story frame. Owner, J. M. Peoples; contractor, Geo. Houston; cost, \$3,123; signed, March 27; filed, April 2; \$775 shingled; \$775 brown mortared; \$775 windows in place; \$798, 35 days.

Dupont, north of San Francisco, two-story frame. Owner, L. Malatesta; architect, Wm. Mooser; contractor, E. Idalgero; cost, \$3,170; signed, March 30; filed, April 5; sureties, J. Peralto and D. Ferrago, \$1,600; limit, 75 days; 75 per cent. as work is done; balance, 25 per cent. 35 days.

Ellis and Jones, plumbing. Owner, Mrs. A. E. Luhrs; architects, Pissis & Moore; contractors, Sweeney & Kearns; cost, \$1,100; signed, March 7; filed, March 8; \$400 rough work done; \$425 completed; \$275, 35 days.

Ellis and Jones, additions, etc. Owner, Mrs. A. E. Luhrs; architects, Pissis & Moore; contractors, Moore Bros.; cost, \$10,900; signed, March 7; filed, March 8; \$1,500 foundations up; \$1,500 framed; \$1,500 first plaster; \$1,500 interior plastered; \$1,500 ready to paint; \$500 accepted; \$2,900, 35 days.

Eddy and Laguna, two-story frame. Owner, August Koerber; architect, H. Geilfuss; contractors, Von Borstel & Conrad; cost, \$4,695; signed, March 20; filed, March 23; limit, 80 days; \$820 framed; \$900 partitions set; \$900 white coated; \$900 completed; \$1,175, 35 days.

Erie, south of Mission, three two-story frames. Owner, Wm. Ede; architect, A. J. Barnett; contractor, O. E. White; cost, \$6,000; signed, March 28; filed, April 4; surety, Chas. F. Doe, \$3,000; limit, three months after foundation walls are completed; \$1,500 main roof on; \$1,500, outside finish on; \$1,500, completed; \$1,500, 35 days.

Fair Oaks, south of Twenty-second, building. Owner, L. J. Evans; architect, S. Hatfield; contractor, P. F. Lynch; cost, \$4,418; signed, April 1; filed, April 2; surety, W. J. Adams \$3,000; limit, 70 days; \$913 50, roof on; \$800 floors laid; \$800, plastering finished; \$800, completed; \$1,105 50, 35 days.

Front, corner California, painting. Owner, Moses Rosenbaum; architect, Salfeld and Kohlberg; contractor, J. F. Sullivan; cost, \$840; signed, March 1; filed, April 4; sureties, Thos. Winters and P. M. Wellon \$840. 75 per cent. as work progresses, in monthly payments; balance, 25 per cent., 35 days.

Front, corner California, terra cotta work. Owner, Moses Rosenbaum; architect, Salfeld and Kohlberg; contractors, Gladding, McBean & Co.; cost, \$750; signed, March 9; filed, April 4; limit, without delay; 75 per cent. as work progresses; balance, 25 per cent., 35 days.

Front and California, glazing, etc. Owner, Moses Rosenbaum; architects, Salfeld & Kohlberg; contractors, F. H. Rosenbaum & Co.; cost, \$2,125; signed, March 6; filed, March 7; limit without delay; 75 per cent. when glass is set and accepted; balance 25 per cent. 35 days.

Front and California, plastering. Owner, Moses Rosenbaum; architects, Salfeld & Kohlberg; contractor, C. C. Moorehouse; cost, \$2,340; signed, March 1; filed, March 7; sureties, John Tuttle, \$2,340; limit without delay; \$1,150 brown coated, \$600 accepted; \$590, 35 days.

Front and California, sewerage and plumbing. Owner, Moses Rosenbaum; architects, Salfeld & Kohlberg; contractors, Fritz & Kean; cost, \$2,000; signed, March 1; filed, March 7; limit without delay; \$1,000 rough plumbing in; \$500 accepted; \$500, 35 days.

Front and California, galvanized iron and tinning. Owner, Moses Rosenbaum; architects, Salfeld & Kohlberg; contractor, Jos. Forde; cost, \$1,125; signed, March 1; filed, March 7; 75 per cent. of work progresses; balance, 35 days.

Front and California, cast and wrought iron work. Owner, Moses Rosenbaum; architects, Salfeld & Kohlberg; contractors, Phoenix Iron Works; cost, \$2,110; signed, March 1; filed, March 7; limit without delay; 75 per cent. as work progresses; balance, 25 per cent. 35 days.

Front and California, cut stone work. Owner, Moses Rosenbaum; architects, Salfeld & Kohlberg; contractors, McGowan & Butler, et al; cost, \$12,750; signed, March 6; filed, March 7; sureties, C. A. Warren and C. S. Holmes \$12,750; limit without delay; 75 per cent. as work progresses; balance 35 days; payments on 1st of each month.

Front and California, carpenter work. Owner, Moses Rosenbaum; architects, Salfeld & Kohlberg; contractor, A. Jackson; cost, \$10,000; signed, Feb. 28; filed, March 7; sureties, Chas. & Frank P. Doe \$10,500; 75 per cent. as work progresses on 1st of each month; balance 25 per cent., 35 days.

Front and California, moving old building and brick work for new one. Owner, Moses Rosenbaum; architects, Salfeld & Kohlberg; contractor, John McCarthy; cost, \$13,475; signed, Feb. 2; filed, March 7; sureties, Richard J. McCann and Thos. C. Riddell \$13,275; limit, 100 days; 75 per cent. on completion of each story; 25 per cent., 35 days.

Fillmore and Germania, two-story frames. Owner, Mrs. A. C. Stohlmann; architect, E. John; contractors, Von Borstel & Conrad; cost, \$4,794; signed, March 15; filed, March 18; \$1,000 framed; \$1,500 rough mortared; \$1,095.50 accepted; \$1,198.50, 35 days.

Fell and Broderick, two-story and basement frame. Owner, B. E. Henriksen; architect, B. E. Henriksen; contractor, Robt. Currie; cost, \$5,600; signed, March 21; filed, March 21; \$1,050 roofed; \$1,050 brown coated; \$1,050 white coated; \$1,050 trimmings on; \$1,400; 35 days.

Golden Gate Avenue, near Lyon, frame dwelling. Owner, Mac C. Madden; architect, T. J. Welsh; contractor, C. E. Dunshie; cost, \$3,800; signed, March 13; filed, March 14; limit, 90 days; \$315 framed; \$2,000 white coated; \$500 completed; \$985, 35 days after.

Golden Gate Avenue near Jones, alterations in four brick buildings now being erected. Owner, Lizzie W. Moffatt; architect, Chas. I. Havens; contractor, Chas. C. Terril; cost, \$10,667.50; signed, March 16; filed, March 18; installments on 15th of each month in sums of 75 per cent., balance, 35 days.

Howard, near Twentieth, building. Owner, Sarah Miller; architect, T. J. Welsh; contractor, James McInerney; amount, \$5,195; surety, J. J. McKinnon \$3,000; signed, March 26; filed, March 29; limit, 90 days; \$974 framed; \$974 brown mortared; \$974 white mortared; \$974 finished; \$1,299, 35 days.

Howard, corner Mary, building. Owner, James L. Fallon; architect, John J. Clark; contractor, John G. Adams; amount, \$7,950; sureties, E. W. Hannon and Fabian Joost; \$7,000; signed, March 5; filed, March 28; limit, 100 days; \$1,980 framed; \$1,980 brown mortared; \$1,980 inside finished; \$2,010, 35 days.

Hayes, near Broderick, building. Owner, C. B. Hawley; architect, Charles I. Havens; contractor, Dan Chisholm; amount, \$7,799; signed, March 25; filed, March 28; \$1,299 enclosed; \$1,500 brown mortared; \$1,500 hard finished; \$1,500 completed; \$2,000, 35 days.

Hermann, near Jessie, three-story frame. Owner, Christina Miller; architect, A. J. Barnett; contractor, Brennan Bros.; amount, \$5,660; sureties, J. J. McKinnon and D. J. Preston, \$3,000; signed, March 25; filed, March 28; limit, 100 days; \$1,160 roof on; \$1,000 brown mortared; \$1,000 outside finished; \$1,000 completed; \$1,500, 35 days.

Howard and East, foundation for road bed. Owners, Omnibus Cable Co; architect, Engineer of Co; cost, \$2,050; signed, March 8; filed, March 11; limit, 30 days; 75 per cent. as work progresses, balance 25 per cent., 35 days after.

Henry near Noe, building. Owner, P. Conlin; architect, T. J. Welsh; contractor, James McInerney; cost, \$2,000; signed, March 11; filed, March 15; sureties, P. F. Ward and J. J. McKinnon, \$1,500; \$500 framed; \$500 brown mortar; \$500 completed; \$500, 35 days after.

Haight, between Steiner and Pierce, three-story frame. Owner, August Kenerleber, et al; architect, R. Zimmermann; contractor, Adam Miller; cost, \$5,100; signed, March 2; filed, March 19; \$1,000 framed; \$1,000 enclosed; \$1,000 rough mortared; \$1,000 completed; \$1,100, 35 days.

Haight near Gough, addition for a market. Owner, A. P. Hotaling; architect, Wm. Mooser; contractors, Norton & Perry; cost, \$3,250; signed, March 21; filed, March 23; limit, 70 days; 75 per cent. as work progresses, balance 25 per cent., 35 days.

Howard, Nos. 1713, 1715, 1719, brick foundations. Owner, James Phelan; architect, Jno. Marquis; contractor, Martin Fennel; cost, \$1,845; signed, March 23; filed, March 23; limit, 50 days; \$354 No. 1719, finished; \$343, 1717 finished; \$343, 1715 finished; \$343, 1713 finished; \$452, 35 days.

Henry near Sanchez, two-story frame. Owner, Henry Harms; architect, J. E. Kraft; contractor, J. W. Smith; cost, \$3,157; signed, March 6; filed, March 9; limit, 70 days; \$750 enclosed; \$750 brown mortared; \$857 completed; \$800, 35 days.

Hayes near Gough, building. Owner, Philip Pasener; architects, Salfeld & Kohlberg; contractors, Martin & Maguire; cost, \$6,000; signed, March 15, filed, March 18; sureties, Frank P. Latson and J. W. Welsh \$6,000; limit, 100 days; \$1,000 framed; \$1,000 brown mortared; \$1,000 inside finished; \$1,500 accepted; \$1,500, 35 days.

Hayes near Buchanan, two-flats. Owners, John Boyd and wife; architects, Donovan & Williams; contractors, Donovan & Williams; cost, \$4,625; signed, Feb. 26; filed, March 7; sureties, Preston & McKinnon, \$2,000; limit, July 1, '89; \$1,000 enclosed; \$800 brown coated; \$600 white coated; \$1,025 completed; \$1,200, 35 days.

Haight, west of Steiner, two-story frame. Owner, Jos. Bock; architect, A. J. Barnett; contractor, Rountree Bros.; cost, \$6,700; signed, April 2; filed, April 4; sureties, Behrend Joost and W. A. Meeker \$3,500; limit, 100 days; \$1,525, roofed; \$1,000 brown coated; \$1,500 white coated; \$1,000, completed; \$1,675, 35 days.

Haight corner of Laguna, two-story frame. Owner, Gustave F. Schmidt and wife; architect, Wm. T. Connary; contractor, Wm. T. Connary; cost, \$7,870; signed, April 1; filed, April 5; \$1,900, framed; \$1,400, sashes fitted; \$1,200, basement done; \$1,042, ready to paint; \$360, completed; \$1,968, 35 days.

Howard, north of Fifteenth, three story frame. Owner, F. G. Gerhard; architect, Henry Geilfuss; contractor, H. J. Weiss; cost, \$3,857; signed, April 4; filed, April 6; \$600, roofed; \$600 partitions set; \$657, completed; \$2,000, 35 days.

Haight, between Scott and Devisadero, two-story frame. Owner, Jos. M. Kane; architects, Schmidt & Shea; contractor, Wm. Pluns; cost, \$4,700; signed, April 4; filed, April 6; sureties, F. and B. Joost; \$800 rustic on; \$900 rough plumbing in; \$900 hard finished; 900 completed; \$1,200, 35 days.

Jackson, corner Broderick, carpenter work. Owner, J. Dupuy; architect, Wm. Mooser; contractor, M. C. Lynch; cost, \$3,500; signed, April 3; filed, April 4; sureties, John Lewis and P. Swift; \$2,000; \$2,000 third story joists laid; \$2,000 iron work on; \$2,000 yard work finished; \$2,098 ready to paint; \$2,700, 35 days.

Jackson, near Webster, brick and carpenter work. Owner, Carl Walliser; architect, Wm. Mooser; contractor, Geo. J. Doering; amount, \$3,083; signed, March 23, filed March 25, limit, 100 days, 75 per cent. as work progresses, balance, San Jose and vicinity. [From our Special Correspondent.] 25 per cent., 35 days.

Jackson near Laguna, building. Owner, Mrs. W. F. DeForest; architect, Samuel Newson; contractor, George R. Lang; cost, \$5,650; signed, March 18; filed, March 20; \$350 framed; \$500 roofed; \$1,000 white mortared; \$1,000 outside primed; \$1,200 completed; \$1,600, 35 days.

Laguna and Washington, building. Owner, Matilda L. Castle; architect, W. J. Mathews; contractors, Knight & Littlefield; cost, \$10,194; signed, March 6; filed, March 19; limit, July 10, '89; 75 per cent. as work progresses, balance 25 per cent. 35 days.

Laussat, between Fillmore and Steiner, two-story building. Owner, M. McIntyre; architect, Wm. Mooser; contractor, D. Chisholm; cost, \$2,000; signed, March 11; filed, March 13; sureties, F. Joost; limit, 60 days; 75 per cent. in proportion to work done, balance, 25 per cent., 35 days after.

Leavenworth near Clay, three-story frame. Owner, Isaac L. Hoffman; architects, C. R. & J. M. Wilson; contractor, F. V. Steinman; cost, \$8,400; signed, March 7; filed, March 7; \$2,000 framed; \$1,000 enclosed; \$1,000 brown coated; \$1,000 white coated; \$1,300 completed; \$2,100, 35 days.

Lafayette, south of Minna, three-story frame. Owner, Jos. A. Cruza; architect, H. Geilfuss; contractor, John Foster; cost, \$5,500; signed, March 19; filed, April 5; sureties, John Smith and Wm. Swift, \$3,000; \$1,100 framed; \$1,000 brown coated; \$1,000 white coated; \$1,000 completed; \$1,400, 35 days.

McAllister near Lyon, building. Owner, F. P. Adams; architect, B. E. Henriksen; contractor, Louis Helbing; cost, \$4,100; signed, March 21; filed, March 21; \$768 roofed; \$769, brown coated; \$769 white coated; \$769 trimmings on; \$1,025, 35 days.

Market, northeast City Hall avenue, plumbing. Owner, Margaret Lynch; architect, Jas. E. Wolfe; contractor, E. Wolfe; cost, \$1,040; signed, March 22; filed, April 2; 75 per cent. as work progresses; balance, 25 per cent., 35 days.

Market, northeast City Hall avenue, plumbing. Owner, G. G. Burnett; architect, Jas. E. Wolfe; contractor, E. Wolfe; cost, \$1,875; signed, March 22; filed, April 2; 75 per cent. as work progresses; balance, 25 per cent., 35 days.

McAllister, east Scott, two-story frame. Owner, H. W. Frank; architect, Charles I. Havens; contractor, John G. Adams; cost, \$5,725; signed, April 2; filed, April 3; \$1,000 enclosed; \$1,000 brown coated; \$1,000 hard finished; \$1,225 completed; \$1,500, 35 days.

Market, between Sixth and Seventh, elevator work for foundation. Owner, Joseph Rosenthal; architects, Salfeld & Kohlberg; contractors, Wm. H. Birch & Co.; cost, \$5,300; signed, January 28; filed, April 4; 40 per cent. of work accomplished at end of each month; balance, 35 days.

Ninth and Harrison, three-story frame. Owner, Michael Bohanan; architect, T. J. Welsh; contractor, James F. Logan; cost, \$5,387; signed, March 8; filed, March 11; limit, 90 days; \$996 framed; \$996 brown mortared; \$996 white mortared; \$999 finished; \$1,400, 35 days.

No. 2615 California street, additions. Owner, E. A. Selfridge; architects, Schulze & Meeker; contractor, Wm. Winnie; cost, \$2,270; signed, March 28; filed, April 1; sureties, Nathan Rosenberg and V. Z. Horton, \$750; limit, June 15, '89; \$900 roofed; \$802 complete; \$568, 35 days.

No. 1516, Twenty-Fourth, alterations. Owner, Susie Solomon; architect, James H. Humphreys; contractors, Lehnhard & Jeffrey; cost, \$1,900; signed, March 2; filed, March 5; sureties, Isidore Asch and Niehaus Bros. & Co. \$1,900; limit, May 2, '89; \$475 floors laid; \$475 brown coated; \$475 completed; \$475, 35 days.

O'Farrell, corner Buchanan, painting. Owner, Robert Lorentz; architect, W. Winterhalter; contractor, Frederick Schaefer; amount, \$680; signed, March 23; filed, March 29; limit, 12 days; \$180 outside two coats and roof, one coat; \$320 completed; \$180, 35 days.

O'Farrell and Leavenworth, alterations, etc. Owner, Wm. Schehr; contractor, G. W. Hansbrough; cost, \$4,200; signed, March 8; filed, March 9; sureties, W. Edwards and Jno. F. Taylor; \$1,000 framed; \$1,000 brown mortar; \$1,000 white mortar; \$1,200 completed.

Post, corner Jones, plumbing, etc. Owner, Thomas Lundy; architect, T. J. Welsh; contractor, R. Vance; amount, \$1,389; signed, March 30; filed, March 30; \$600 pipes in; \$389 completed; \$400, 35 days.

Post, near Polk, building. Owner, L. Kutter; architect, W. H. Armitage; contractor, J. W. Wissing; amount, \$1,975; sureties, Reese Llewellyn, \$4,000; signed, March 13; filed, March 29; limit, 100 days; \$1,200 framed; \$1,200 brown mortared; \$1,200 completed, \$1,375, 35 days.

Page, near Fillmore, brick and carpenter work. Owner, J. G. Bloomer; architect, James E. Wolfe; contractor, John J. Dunn; amount, \$3,772; surety, C. S. Holmes, \$1,000; signed, March 21, filed, March 28, \$820 framed, \$720 brown mortared, \$720 standing finish; \$569 completed; \$943, 35 days.

Pine near Baker, one-story frame. Owner, S. P. Taylor and wife; architect, G. G. Gillespie; contractor, G. G. Gillespie; cost, \$2,400; signed, March 4; filed, March 6; \$450 framed, \$450 brown coated; \$450 white coated; \$450 completed; \$600, 35 days.

Post, between Hyde and Larkin, brick and carpenter work. Owner, Bernard Miller; architects, Salfeld & Kohlberg; contractors, Fuchs & Bucher; cost, \$8,494; signed, March 12; filed, March 18; sureties, G. H. Woerz and M. Schwab, \$8,494; limit, 100 days; \$1,500 framed; \$1,000 roofed; \$1,500 brown mortar; \$1,000 doors hung; \$1,344 accepted; \$2,150, 35 days.

Post, between Hyde and Larkin, plumbing, etc. Owner, Bernard Miller; architects, Salfeld & Kohlberg; contractors, Sam'l. Inkelheimer & Bro.; cost, \$657; signed, March 12; filed, March 18; \$300 when rough work is done; \$375, 35 days after.

Pine, east Lyon, building. Owner, Anna R. McPhee; architect, S. Hatfield; contractor, Allan McDonald; cost, \$3,785; signed, March 30; filed, April 2; sureties, Frank P. Latson and J. J. McKinnon \$2,500; limit, 60 days; \$800 roof on; \$679 first coat of mortar on, etc.; \$679 windows in; \$680 completed; \$947, 35 days.

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METALCORED
RUBBER STOPPERS.
SUPERIOR TO ANYTHING IN THE MARKET.
CHEAP AS THE ALL BRASS.
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Water Pipe, Chimney Pipe,
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FIRE BRICK AND FIRE CLAY.
106 MARKET STREET,
San Francisco.

Post, corner Jones, brick, iron and carpenter work, etc. Owner, Thomas Lundy; architect, T. J. Welsh; contractor, George W. Hansbrough; amount, \$20,900; sureties, J. M. Manning and J. F. Taylor, \$10,000; signed, March 26; filed, March 28; \$3,000 first-story joists are on; \$3,000 framed; \$3,000 brown mortared; \$3,675 white mortared; \$3,000 completed; \$5,225, 35 days.

Sutter street, No. 1321, additions. Owner, Mary L. Zimmerman; architects, Schmidt & Shea; contractor, Wm. Plun; cost, \$7,740; signed, April 4; filed, April 6; sureties, F. Joost and D. Woerner, limit, 130 days; \$1,240 enclosed, \$1,500 brown coated, \$1,500 hard finished, \$1,500 completed, \$2,000, 35 days.

Sacramento, near Steiner, two-story frame. Owner, Mary F. Kennedy; architect, J. A. Shepard; contractor, J. P. Shepard; amount, \$4,785; signed, March 29; filed, March 30; limit, 90 days; \$1,185 enclosed, \$1,200; brown mortared; \$1,200; completed \$1,200, 35 days.

Second and Folsom, iron and tin work, etc. Owners, Boyd & Davis; architect, Jno. M. Curtis; contractors, Conlin & Roberts; cost, \$6,763; signed, March 14; filed, March 21; sureties, Jeremiah Mahony and Oscar Lewis, \$2,500; 25 per cent. half done; completed, 50 per cent., balance 35 days, \$350 for extras.

Shotwell and Twenty-Fifth, two cottages. Owner, Emma L. Dick; architect, C. E. Dunshee; contractor, C. E. Dunshee; cost, \$4,950; signed, March 7; filed, March 7; limit, 60 days; \$1,237.50 chimneys built; \$1,237.50 1st coat of plastering on; \$1,237.50 2d coat of plastering on; \$1,237.50, 35 days.

Sanchez, between Sixteenth and Seventeenth, two-story dwelling. Owner, J. Jensen; architect, Geo. Houston; contractor, Geo. Houston; cost, \$2,894; signed, March 5; filed, March 6; limit, 100 days; \$721 shingled; \$721 brown mortar; \$722 white mortar; \$730, 35 days.

Spear, between Market and Mission, piling and capping for building. Owner, Teresa Casserly; architects, Percy & Hamilton; contractors, Mahoney Bros.; cost, \$6,750; signed, March 18; filed, March 23; limit, 90 days; 75 per cent. 1st Saturday of each month as work progresses, balance 25 per cent. 35 days, also \$30 for each pile driven.

Scott and Page, one-story frame. Owner, Mrs. M. Grant; architect, Chas. I. Havens; contractors, R. Doyle & Son; cost, \$1,689; signed, March 11; filed, March 13; limit, 60 days; \$500 roof on; \$689 completed; \$500, 35 days after.

Seventeenth, east Noe, carpenter work. Owner, J. D. Jacobs; architect, Jas. E. Wolfe; contractor, J. J. Dunn; cost, \$4,490; signed, April 4; filed, April 6; \$600 rafters on, \$650 partitions set; \$750 brown mortared, \$700 white mortared, \$665 completed, \$1,125, 35 days.

Twentieth, between Dolores and Guerrero, two-story. Owner, H. H. Birkholm; architect, Chas. S. Shaner; contractor, A. A.

Willis; cost, \$5,445; signed, March 15; filed, March 18; sureties, F. Joost and C. S. Holmes; limit, July 15, '89; \$1,000 brick work done; \$1,020 chimneys built; \$1,020 brown mortar; \$1,043.75 ready to paint; \$1,361.25, 36 days.

Turk near Franklin, four two-story and basement frames. Owner, James H. Garrett; architect, R. H. White; contractor, Jas. R. Wilcox; cost, \$18,000; signed, March 11; filed, March 19; sureties, A. W. Starbord, \$5,000; \$2,700 first floor of joists on; \$2,700 enclosed; \$2,700 brown mortar; \$2,700 staining finish on; \$2,700 completed; \$4,500, 35 days.

Twenty-Fourth near Howard, building. Owner, Jno. McPherson; architect, T. J. Welsh; contractor, Ferd. Klatt; cost, \$2,540; signed, March 12; filed, March 16; \$1,000 framed; \$1,000 brown mortared; \$1,000 white mortared; \$1,200 completed; \$1,340, 35 days after.

Twenty-Fourth corner Bryant, one-story frame and stable. Owner, Geo. Wallenrod; architect, H. Geilfuss; contractor, J. F. Logan; cost, 4,275; signed, April 5; filed, April 6; \$800 roofed; \$800 outside done; \$800 inside done; \$800 completed; \$1,073, 35 days.

Third corner Harrison, iron work, tiles, etc. Owner, Jno. Van Bergen; architect, H. Geilfuss; contractors, P. H. Jackson & Co., cost, \$6,498; signed, April 4; filed, April 6; 75 per cent. as work is performed, balance, 25 per cent., 35 days.

Third corner Harrison, excavations, brick and stone work. Owner, Jno. Van Bergen; architect, H. Geilfuss; contractor, Jno. McCarthy; cost, 18,961; signed, April 4; filed, April 6; \$3,550 basement walls up; \$3,550 first story walls up; \$3,550 third story walls up; \$3,550 fire walls topped; \$4,750, 35 days.

Third cor Harrison, plumbing. Owner, Jno. Van Bergen; architect, H. Geilfuss; contractor, S. Ickelheimer & Bro.; cost, \$1,359; signed, April 4; filed, April 6; \$519 pipes in; \$500 completed; \$340, 35 days.

Third corner Harrison, plastering, etc. Owner, Jno. Van Bergen; architect, H. Geilfuss; contractor, M. Kiernan; cost, \$1,985; signed, April 4; filed, April 6; \$750 brown coated; \$735 white coated; \$500, 35 days.

Third corner Harrison, carpenter work. Owner, Jno. Van Bergen; architect, H. Geilfuss; contractor, M. C. Lynch; cost, \$10,798; signed, April 4; filed, April 6; \$2,000 third story joists laid; \$2,000 iron work on; \$2,000 yard work finished; \$2,098 ready to paint; \$2,700, 35 days.

Third corner Harrison, artificial stone. Owner, Jno. Van Bergen; architect, H. Geilfuss; contractor, H. M. Peterson & Co.; cost, \$1,200; signed, April 4; filed, April 6; \$400 cellar work yard done; \$500 side walks done.

Vallejo east of Buchanan, two-story frame. Owner, C. P. L. Leichter; architect, H. Geilfuss; contractor, Shutt & Kreckler; cost, \$4,485; signed, April 2; filed, April 4; \$840 framed; \$840 partitions set; \$840 outside finished; \$840 completed; \$1,125, 35 days.

Vallejo near Buchanan, frame. Owner, Laura L. Clapp; architect, Clinton Day; contractors, Ingerson & Gore; cost, \$6,350; signed, March 23; filed, March 23; \$1,500 chimneys built; \$1,700 brown coated; \$1,562 ready to paint; \$1,585, 35 days.

Waller near Devisadero, two-story frame. Owner, E. W. Hyde; architect, B. E. Henriksen; contractor, Daniel Reynolds; cost, \$3,200; signed, March 7; filed, March 8; \$600 roofed; \$600 outside finish; \$600 sashes, glazed and hung; \$600 trimmings on; \$800, 35 days.

10 Buildings. Owner, Jos. F. Twist; architect, Wm. F. Lewis; contractor, Wm. F. Lewis; cost, \$8,250; signed, March 21; filed, April 2; limit, June 15, '89; \$500 at beginning of contract, \$5,250 during work, \$2,500 when completed, to be secured by mortgage.

Retail Price List of Lumber.

PINE, FIR AND SPRUCE.		Per 1,000 ft.
Rough Pine, m'cantable to 40 ft inclusive.		\$19 00
" " " 41 to 50 "		20 00
" " " 51 to 60 "		22 00
" " " 61 to 70 "		26 00
" " " 1X3, fencing.		21 00
" " " 1X4, "		20 00
" " " 1X3, 1X4 and 1X6, odd lengths		18 00
" " " second quality.		16 00
" " " selected.		23 00
" " " clear except for flooring.		30 00
" " " for flooring less than flooring.		1 00
Clear V. G. No. 1 Flooring, when ordered, extra.		5 00
Fire Wood.		10 00
Dressed Pine, flooring, No. 1, 1X6.		31 00
" " " 1X4.		33 00
" " " 1 1/2 x 4, 1 1/2 x 6 and odd sizes.		36 00
" " " all sizes, No. 2.		26 00
" " " Stepping, No. 1.		43 00
" " " 2.		33 00
Ship Timber & Plank, rough selected		26 00
" " " select'd pl'nd, 1 sd		av 28 00
" " " " 2 "		40ft 30 00
" " " " 3 "		32 00
" " " " 4 "		34 00
Deck Plank, rough		34 00
" " " dressed		average 35 feet. 39 00
Pickets, rough, B. M.		19 00
" 1/2 x 1 1/2 " 4 ft. long.		per M. 5 50
" 1/2 x 1 1/2 " 4 1/2 ft. long.		6 00
" 1/2 x 1 1/2 " 5 ft. long.		7 00
" 1/2 x 1 1/2 " 6 ft. long.		8 50
" 1/2 x 1 1/2 " 7 ft. long.		10 00
" 1/2 x 1 1/2 " 8 ft. long.		11 50
Furring, 1X2.		per lineal ft. 01
Lath, 1 1/2 x 4 ft.		per M. 2 75
Spruce, rough.		19 00
" " " dressed, shelving.		36 00
" " " clear.		36 00
Rough dunnage, delivered.		20 00

The * California * Architect * and * Building * News

VOLUME 10.

ENTERED AT POST-OFFICE SAN FRANCISCO, AS SECOND-CLASS MAIL MATTER. ESTABLISHED JANUARY, 1879.

NUMBER 5.

Official Organ of the San Francisco Chapter, American Institute of Architects.

INTERESTING TO AMERICAN ARCHITECTS.

Public Companies and the N. S. W. Institute of Architects.

NOW IN ITS TENTH YEAR.

Established Jan. 1879.

Incorporated Jan. 1889.

THE

California Architect & Building News

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TERMS, PER ANNUM, - - - \$2.00 IN ADVANCE

ADVERTISING RATES FURNISHED ON APPLICATION.

SAN FRANCISCO, MAY 15, 1889.

The Whereabouts of Clarence E. Lane.

Should this meet the eye of any one knowing the address of a party going by above name, they will confer a favor by sending information to this office. He is a draughtsman and claims to have worked for Burnham & Root of Chicago. We simply caution every one against said party. His fare was paid to Seattle to enter a good office. On the morning of the day the steamer sailed he feloniously obtained the return of the money on his ticket and has departed for some place unknown. Country Editors and others will confer a favor by noticing the above in their respective Journals.

Our Student's and Draughtsman's Edition.

Interested parties are not giving the attention they should to preparing sketches for our student's and draughtsman's edition. Many promised to "do what they could," but so far, have failed to make their efforts known at this office. We trust that each and every one who intends to furnish sketches or write an article, will notify us at once, so that we may know what to depend upon.

First-Class Draughtsmen Wanted.

If there are any first-class draughtsmen who are out of employment, they will confer a favor by notifying the manager of this Journal. Several good men can readily be placed in good situations.

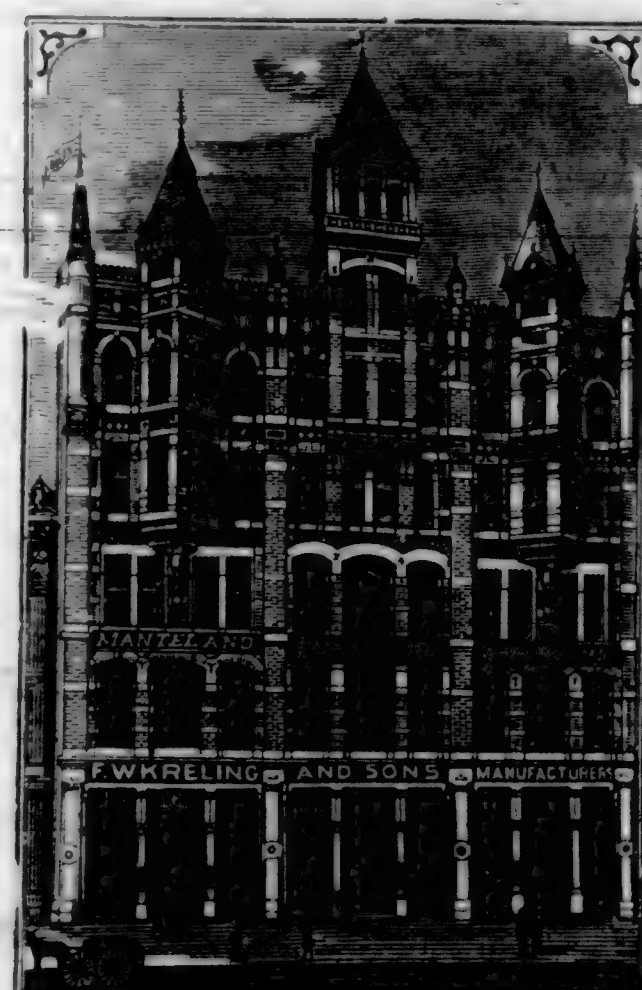
The above is taken from the *Building and Engineering Journal* of Sydney. The same question has often been discussed before the various Chapters of the American Institute. We trust the leading members of the profession will ventilate their views on the subject matter through the columns of this Journal.

Uniform Size of Brick.

The Legislative Committee on uniform size of brick, appointed by the National Association of Builders, presented a report in which they recommended the following as a standard size to be adopted for bricks:

For common building brick, 8 1/4 inches x 4 inches x 2 1/4 inches.
For pressed brick, 8 3/4 inches x 4 inches x 2 3/4 inches.
After considerable discussion, the report was referred back to the Committee. The high seemed to occur on the word "uniform," some of the members claiming that it should be "standard." Also that the size of pressed brick should be 8 1/2 instead of that given in report. The subject will be considered at the next annual Convention.

In the mean while, we will be pleased to receive communications from our own manufacturers on a "standard" size for brick.



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SAN FRANCISCO, CAL.



DESIGN FOR A COUNTRY DWELLING—O. EVERETT, ARCHITECT.

Again Worthy of Notice.

We have called attention several times to the increasing demand for "ABRAHAMSON'S VENTILATORS." This demand has now become very general in its character, and to prove it, we present a list of the new buildings in which these ventilators will be placed.

The following contracts have been made with W. W. Montague & Co., for P. Abrahamson's New Patent Ventilator, for January and February, 1889.

St. Vincent Orphan Asylum, San Rafael, 63 ventilators; The Catholic Convent, San Rafael, 93 ventilators; Centennial Presbyterian Church, Fruitvale, 15 ventilators; Bank and Club Rooms, Sacramento, 24 ventilators; Peralto Park Hotel, Berkeley, 161 ventilators; Hotel Chico, 30 ventilators; San Jose School House, 24 ventilators; Old City Hall, San Jose; Hall of Records, Woodland, 31 ventilators; Union Insurance Company, San Francisco; Francis Smith, Beale street; The New Bank, corner Sansome and Sutter streets, 15 ventilators; Fresno Jail, 20 ventilators.

RESIDENCES.

Mr. A. N. Levy, Webster street; Mr. Kronenberg, Fulton between Gough and Franklin; Mr. Henry, San Jose; Mr. Nicoll, Manager of Bohemian Club; W. Crocker, corner California and Jones; Palace Hotel Dining rooms and other apartments; Youth's Directory, Howard, between Fifteenth and Sixteenth.

The following buildings are out for bids and Abrahamson's Ventilators are specified:

Public School House, Pleasanton California; Daniel Meyers, California street; The New Olympic Club Building; California Theatre and Hotel, Bush street; "Chronicle" building, Market and Kearny streets.

The above will clearly prove the remarks first made, that their use is very general.

Going to the Shop for Solder.

EDITORS CALIFORNIA ARCHITECT: Will you kindly allow a lady subscriber to give a few hints in regard to plumbers and their way of "passing time." A short time ago, I had occasion to have a set of wash trays placed in my laundry. I called upon the nearest plumber to obtain an estimate. Instead of being at my place at the appointed time, it was two hours after, before he came. With the usual "plumbers soft solder," he, by his suave talk convinced me that it would be far more economical for me to have it done by day's work, as contract profits would not in that case be figured in the total. Much against my inward convictions, I allowed him to do the work on the basis of doing it as cheaply as possible. Shortly after a wagon drove up with all the materials; the charcoal fire was lighted, the irons placed therein and all apparently ready for work, when in stentorian tones the boss yelled, "Jack, you got the solder?" "Didn't fetch any," Jack replied. And so Jack had to trot down blocks away for solder. When poor Jack returned, it was discovered that no rosin was to be found, and another trip to the shop was necessary. Four times was it found a necessity for some one to go to the shop for solder. I say solder, because I do know the name of that article, mainly from that kind so often used by smoothly spoken plumbers. When the plumber was through his work, it required the strong arm of my gardener with a spade to scrape off the solder drops all over my floor. And the bill—well it was just \$30, almost double what I had calculated. If I hire a carpenter, he can bring to my house the requisite tools and materials for completing any work he undertakes. Why, then, cannot a plumber do the same, without it being found necessary to send to the shop several times for solder?

Mrs. —

THE IRON AGE.

Paper Read Before the San Francisco Chapter,
American Institute of Architects.

BY G. H. SANDERS, F. A. I. A.

Gentlemen, Fellows and Associates of the San Francisco Chapter of the A. I. A.:

Poem and Legend, Fable and Myth glow with the lustre of the Golden Age; every nation with a history, written or unwritten, has a background of romance which owes its brightness to the same luminous source.

The writings of the poets and moralists of Greece and Rome, through which the threads of authentic history have come down to us, draw their inspiration from a far away time, which, like the lingering afterglow of a glorious summer's day, tells of an era when the world was young, and mankind lived in simplicity and innocence, and enjoyed a happy immunity from the incumbrances and inconveniences of the, perhaps, overwrought civilization of their and our day.

Both Hesiod and Ovid, describe not only a golden, but a silver, a bronze, and an iron age, the former interposing the heroic age between the bronze and the iron. The first four are also mentioned as forming constituent parts of the great image of Nebuchadnezzar's vision as recorded in Daniel—one of the Prophetic books of the Hebrew Scriptures. The mythology of the ancients as well as the clay records of Assyria, are replete with allusions more or less definite, to the same wondrous epoch, as well as to the degeneracy of the succeeding ages.

But authentic or fabulous as these witnesses may be, in the Genetic record alone do we find a coherent, if only figurative account of a condition of things, which could rationally afford an adequate foundation for the all pervading idea of the golden age. We shall return to the subject in our concluding remarks, and will for the present merely state, that of the four ages above recognized, the last has commonly been conceded to be the peculiar heritage of men of the present day.

THE AGE OF IRON.

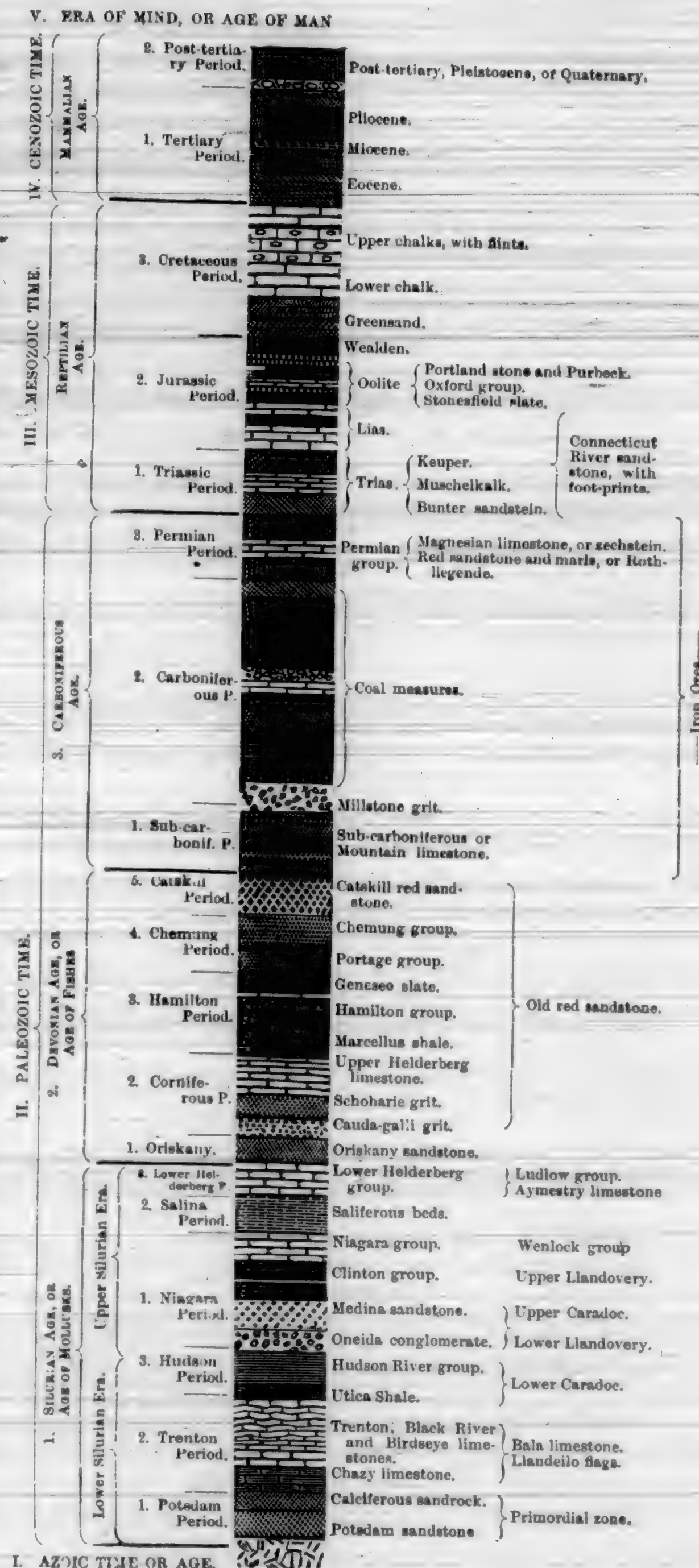
But it is not the "Iron Age," of which we wish now to speak so much as the "Age of Iron," a much more definite and easily apprehended, if less comprehensive idea, than that indicated by the former term, which indeed may be taken to include the whole range of the philosophy, sciences, arts and morals—nay, even the religion of the times, with all their respective concomitants and accessories which together make up the life of the man of the nineteenth century.

But putting aside for the present the uncertain traditions, and the myths and allegories of the days of old, the scientific explorer of our times has collected, classified, and arranged in orderly sequence, the evidences of at least three ages, neither fabulous nor figurative, which have prevailed in former times. These are known as the stone, the bronze, and our own iron age, from the material which was most generally employed during the respective periods in the ordinary implements of utility and defense, all the stages of which may be found practically existing amongst various barbarous nations of our own day and generation.

This brings us face to face with our subject proper, and the chief element of its title, viz.: Iron.

This is a substance of such world wide utility that it is apt to appear impossible to dispense with it. This, however, is disproved by the history of past times as well as by the known conditions of many peoples and tribes of the present day, though their position and status, indeed, may be said to be measured by the degree of their knowledge and appreciation of this significant material.

To fully comprehend the true position of iron in the scale of life, we must glance at its position in the scale of creation. Accepting as such the accompanying Geological section of the shell or crust of the earth, we will ask your attention to a brief examination of its component parts and the manner of their formation—the accompanying section (1) (from Geological Section in Webster's Dictionary), which is generally taken to represent a total thickness of about thirty miles, is just about the 330th



part of the diameter of the earth, or about the comparative thickness of an ordinary egg shell.

The entire internal body of the earth has been supposed to be a molten mass, and to properly understand this we must begin at the beginning, and the beginning in this case is

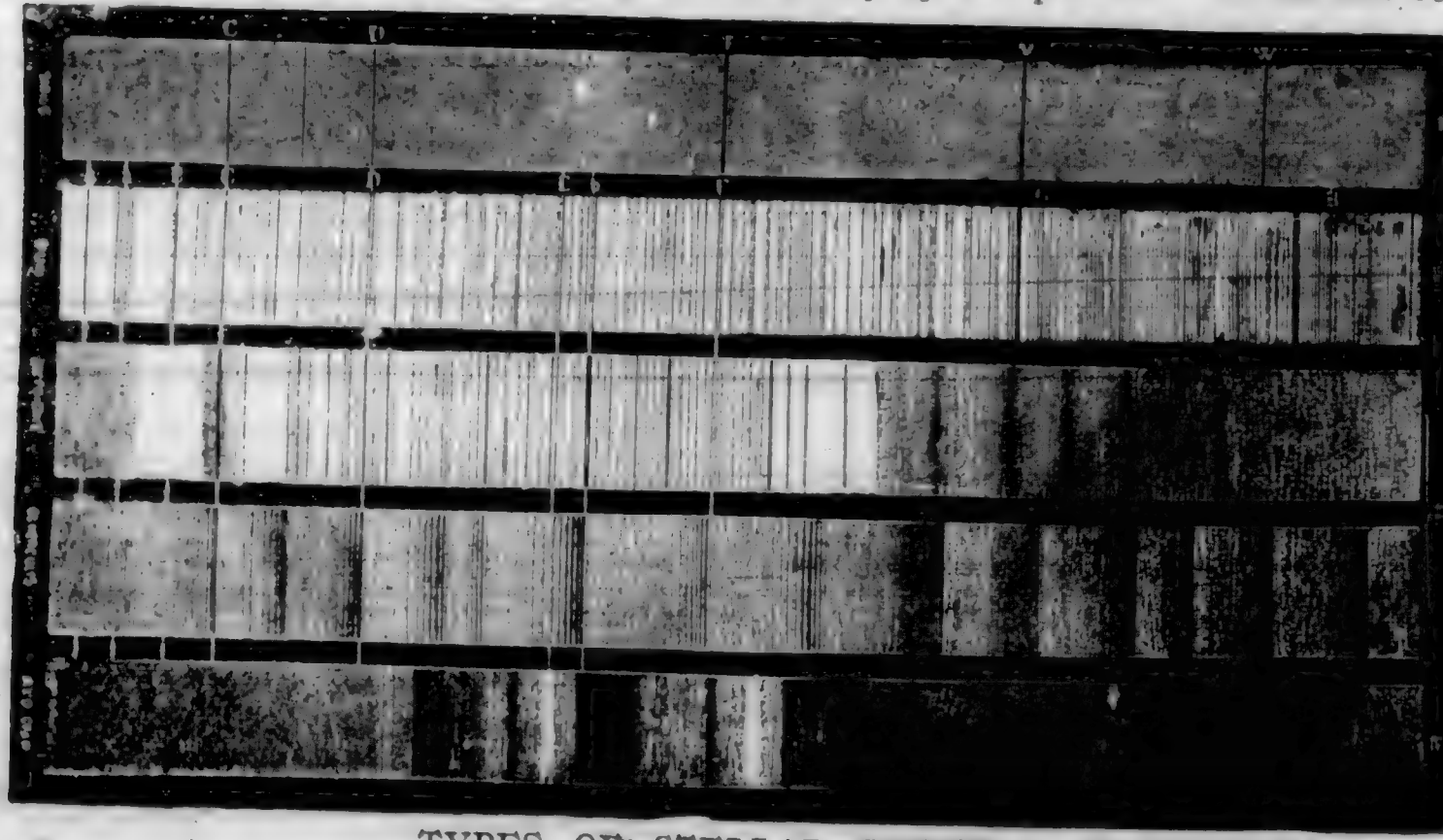
"NEBULAE."

In (No. 2, we have a representation of the great nebula in Orion, one of the most astonishing of all the star clusters in the heavens, combined as it is with clouds of incandescent hydrogen, which, by aid of the solar spectrum, indicate by the various absorption bands the presence of a number of terrestrial substances, among which those of hydrogen and the metals predominate.

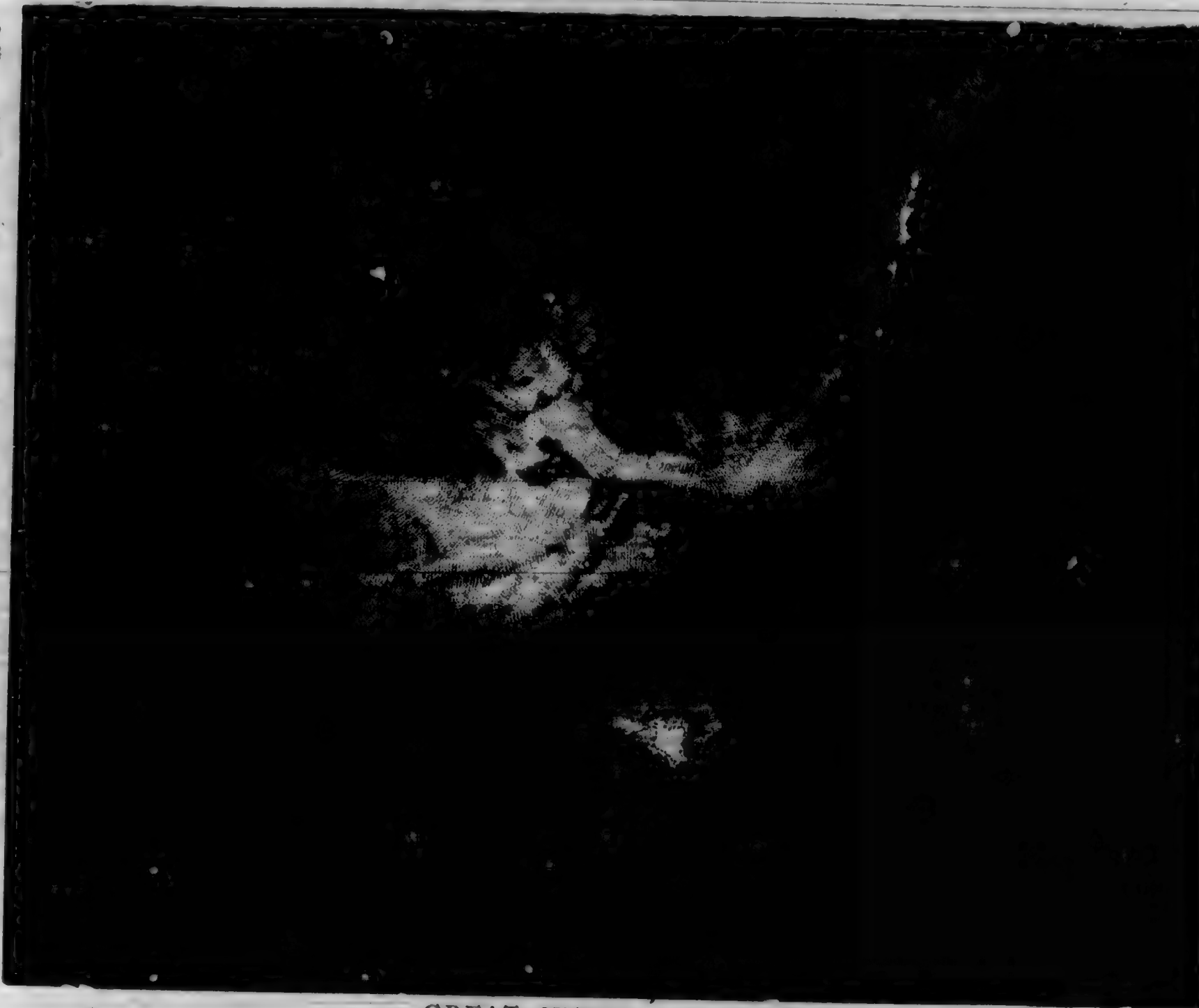
The latest accepted theory in regard to these mysterious accumulations of aerial substances, appears to be as follows: As the vast masses of hydrogenous drift called nebulae, revealed by powerful telescopes in the fathomless depths of the heavenly spaces, are caught here and there in the eddies arising from the inevitable friction resulting from ethereal motion, aggregations of condensation naturally occur, and in the vast sweep of inconceivable ages, under the influence of all pervading Law, universes of harmoniously balanced solar, planetary and lunar systems, with all their necessary and appropriate accompaniments, come into being. The diagonal of centrifugal and centripetal forces which have arisen in the case of each initial eddy, establishes a center of gravitational energy, which becomes in time a sun, and the sun in the progressive evolution of being, becomes in turn an earth, and by successive condensations and depositions of the fiery gases in the form of more and more solid materials, an orb, capable of receiving and sustaining life, slowly emerges from the womb of creation, and a world of life is born. The first rain drop which reaches the cooled surface of a new born world marks an epoch. The last that ever falls on the same earth marks another. Between them lies the history of the life of that world!

The condensation and deposition of material at first ethereal, then gaseous, then aqueous, necessarily include phenomena impossible to describe because incapable of being seen by any other faculty than that of imagination. It can only be said that what does occur must have taken place in the case of our earth in the order here represented. (No. 1.)

First: The igneous or primary rocks of the Azoic age with only the outer rim of which we can ever become acquainted; then depositions of materials caused by erosion in the earliest seas form vast strata which underlie all others and have solidified into the rocks of the second or Paleozoic series, succeeded by the Mesozoic and Cenozoic times or ages, and finally by the present



TYPES OF STELLAR SPECTRA. (See note page 71.)



GREAT NEBULA IN ORION.

time or age, known as the age of mind, or of man.

The second or Paleozoic series of times or ages are divided into three great epochs, viz.: The Silurian age or age of Mollusks; the Devonian age or age of fishes, and the Carboniferous age, or age of plants; while the Mesozoic corresponds to the single age of reptiles, and the Cenozoic to the Mammalian age. All these enormous periods are divided and subdivided again and again, so that every strata has its place in the vast whole in such a way as to be readily recognizable, if not by its intrinsic characteristics, it may still be identified by those of its neighbors above and below. But of the whole, it is with the upper third of the second or Paleozoic time, called the Carboniferous age, that we have to do. The included strata are known as the coal measures, and contains a well most of the workable beds of iron ore. Associated with the coal measures also are vast strata of limestones, including the sub-carboniferous or mountain limestones, and superimposed beds of magnesian limestones—the former indispensable as fluxes, and the latter, recently found to be equally valuable as a means of purifying the ore from the phosphorous and sulphur often contained in the coal used in the process of converting the iron into steel. The iron ores also, which are principally worked, have themselves been largely the result of plant growth, as by the process of absorption of metallic vapors from the atmosphere by the vegetation, and the setting free of the mineral thus held in combination by the decay of root fibres, etc., the oxidized metal has been carried down and caught in the subjacent sandstones and clay stone rocks, and so has formed the ferruginous earths and beds known as Iron stone, Haemetite, etc. We thus see in the very center of the scale, associated with the great belt of the coal measures, evidences of a time or age of extraordinary plant growth and of conditions of solar, aqueous and atmospheric phenomena unprecedented in the life of our planet; a time or age of light and heat storage, and of strength and energy storage, and of such other peculiar and suggestive combinations as to justify to some extent the claims of these same coal measures as the real bona fide iron age after all; or at least it would appear that by the, shall we not say, Providential provisions of the law of natural selection, all the necessary elements have been brought together for the development of this present existing wonderful age or time, which all are ready to recognize as the "Age of Iron."

The qualities of cast and wrought iron and steel are so well known as scarcely to need mention, except for the sake of reference hereafter.

Fusibility, density and inflexibility in the case of cast iron, and malleability, ductility and elasticity in the case of wrought iron or steel generally cover their respective characteristics and constitute their valuable properties. Transverse strength and resistance to crushing in the case of cast iron, and of shearing in the case of wrought iron as well as the still more valuable capacity to resist tensile strains in the case of the latter substance, are in every way enhanced in cast and wrought steel, and still other valuable properties in what is known as malleable cast iron. The Bessemer and other processes of converting pig iron into steel, or, still better, directly from the ore, by forcing a blast of atmospheric air through the molten mass of metal in a crucible, has added so enormously to the availability of steel as a lighter, stronger, and more reliable substitute for ordinary iron, for almost all purposes for which the latter has hitherto been used, as almost to constitute as great a possible development in manufactures and means of ultimating great enterprises as the invention of the steam engine itself.

THE APPLICATION OF IRON.

But passing from this phase of the subject to the application of iron in the arts of construction, we will note its progress as an agent in the accomplishment of some of the great enterprises of the century.

BRIDGES.



LONDON OLD BRIDGE.

The first illustrations to which we will ask your attention are a number of bridges. These useful structures have, in all ages, taxed the ingenuity of engineers to construct, and may be said to have been a most important means of education, in enabling him to surmount difficulties and achieve success in almost every direction in which his energies have been exerted. The first structure represented on this slide is Old London Bridge. This is a striking example of the cumbersome obstructiveness not unusual in the methods of the past. It was begun in 1178,

by Peter of Cole Church, and was thirty-three years in building. Often covered with large and picturesque masses of wooden buildings which were as often destroyed by fire—the main structure appears to have remained until the beginning of this century, essentially as it was built. The next illustration, which is New London Bridge, was designed by Mr. George Rennie, and built by his brother, Sir John. This a beautiful structure; having spans of 152 feet, and twenty-nine foot rise of arch, replaced the old bridge which was removed to make way for it.



LONDON NEW BRIDGE.

Waterloo Bridge was erected in 1817, and is of a similar character to the preceding, being constructed of stone in many arches, of less span, but in a wider part of the river. See next illustration.

But the next example is altogether different in material, if not in form. Until recent years, stone, brick or timber was the

material almost always employed in the construction of bridges; but late in the last century cast iron began to be employed, and the specimen here shown—Southwark Bridge over the Thames, 240 foot in span of arch, is not regarded as a success, in view of the material used, as it is unnecessarily heavy and expensive.



WATERLOO BRIDGE.

The next specimen here shown, the Menai Suspension Bridge, indicates a great advance in the right direction. The use of chains or links and wire cables on the suspension principle began to be quite usual before this structure was commenced by Telford in 1819. It is 570 feet span, and has a versed sine of forty-three feet for the curve of the Catenary.

This form of bridge, however, was not at this time found suitable for railways. The objection raised on account of vibration has been obviated by the principle introduced in the next example, known as the Britannia Tubular Bridge, designed and built by Robert Stephenson in 1845. It shows a



SOUTHWARK BRIDGE.

complete revolution in the construction of bridges, which, has led to vast results. This bridge consists of two independent wrought iron tubular beams 1511 feet long, each 15 feet wide and 23 feet high at ends, and 30 feet in center. The central pier is 230 feet high, and the two center spans are 460 feet each. The land spans on each side are 230 feet each in length. The top and bottom flanges of these immense girder tubes are cellular

in construction, and the floor and ceiling are strengthened by keelsons and gussets, and the side plates are strengthened by T irons inside and out. This bridge, however, in this peculiar form has only once been repeated in the Victoria Bridge over the River St. Lawrence, in Canada which is 7,000 feet in length, and whose spans are almost equal to those of the Britannia Bridge. The mode of construction, the methods of floating the tubes into

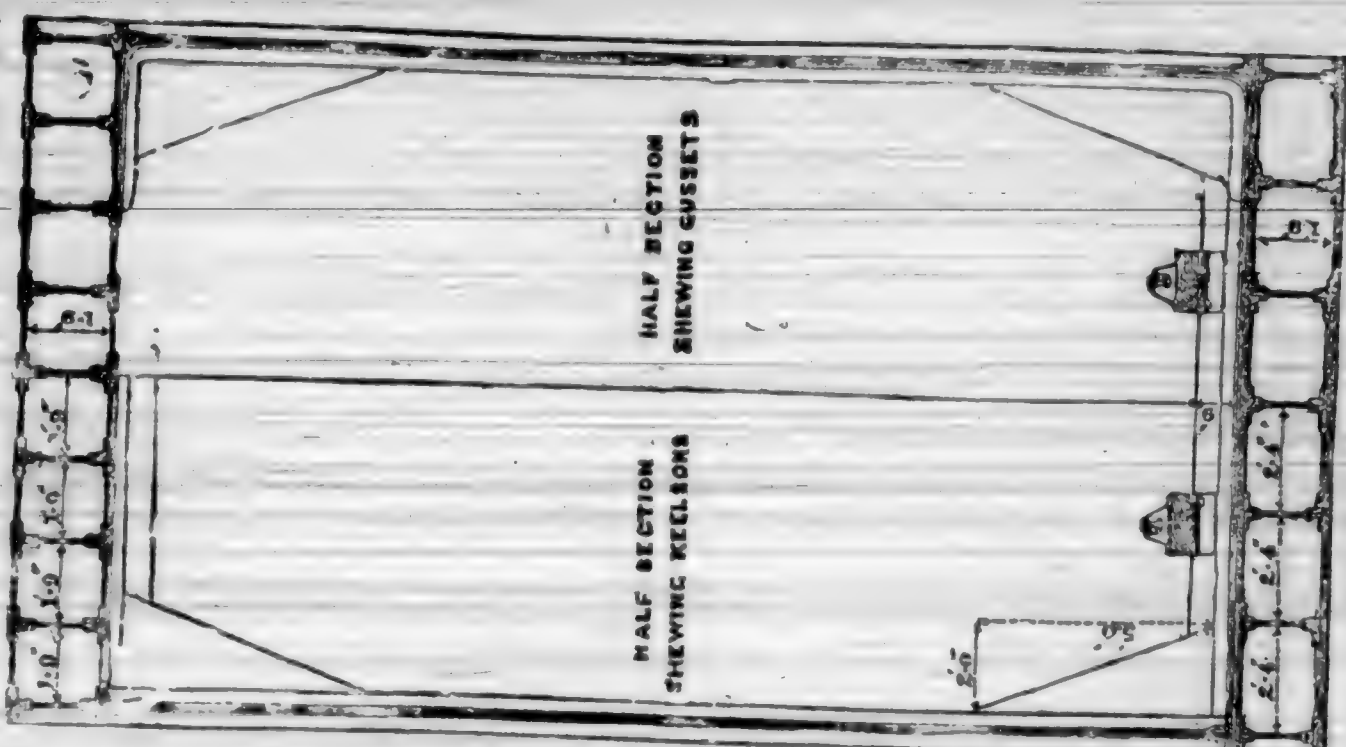
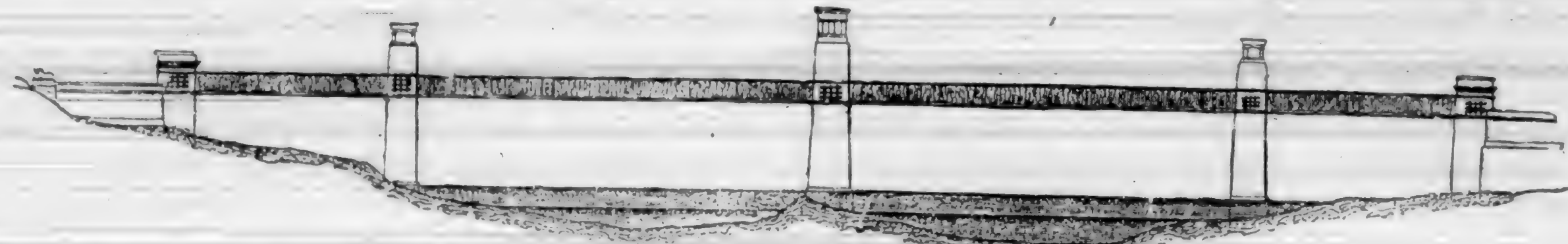
position and raising them into their places by hydraulic pressure, and the final triumphant success of both these undertakings, together with the interesting incidents, and imminent risks to which both were subject, owing to the dangerous condi-

tions attending their construction, has almost the interest of a romance, and has raised both these enterprises, together with the name of their designer, into a prominence which can never be lost. Nevertheless, it is certain that they are never likely to be



MENAI SUSPENSION BRIDGE.

repeated, since more economical and advantageous forms of construction have arisen from the principle which they inaugurated, one type of which is the high level bridge at Newcastle. This is a combination known as the bow string girder, an open tube carried on a cast iron arch and wrought iron tie (see plan and elevation) presenting an appearance of great lightness and beauty, and being more economical, and avoiding the disadvantages of the close tunnel form so objectionable in such long structures as the Britannia and Victoria Bridges, which shut out light and air, and the fine scenery which such situations usually present; but even this form of the tubular bridge is unnecessarily expensive, and the experiment is not likely to be again made. It was simply a combination of the truss with the arch and tube, both of which latter are wholly dispensed with in the next

BRITANIA BRIDGE.
(Cross Section of Tubular Girder.)

BRITANIA TUBULAR BRIDGE.

example, shown in elevation and section, which is the Newark Dyke Bridge, erected in 1853. It is the first, and a fine specimen of the Warren girder; and on account of

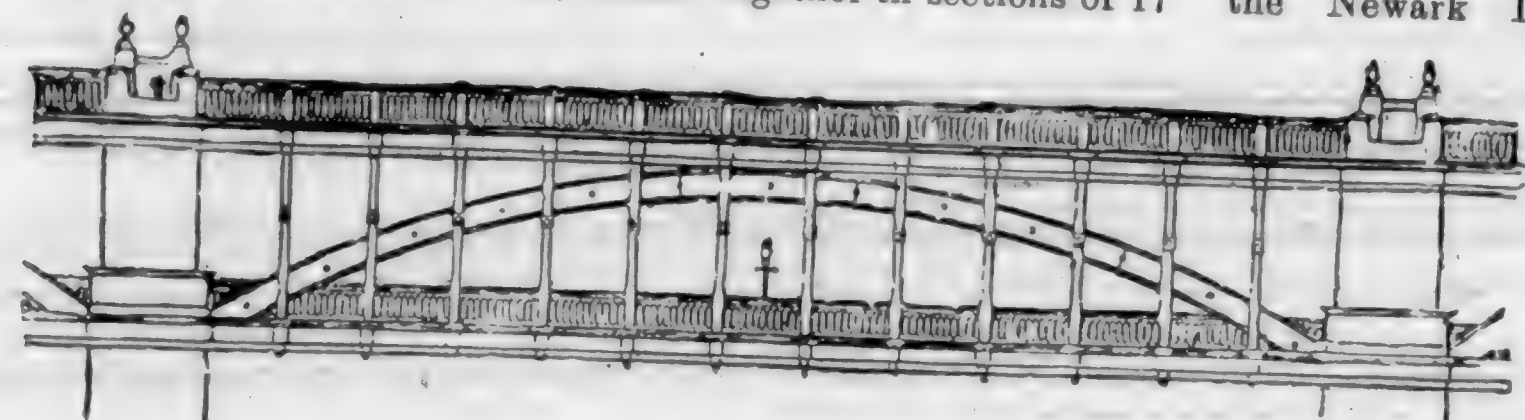
its economy of construction and freedom from any unnecessary accessories, is a very frequent mode of truss construction, especially in America, in wood and iron, or both.



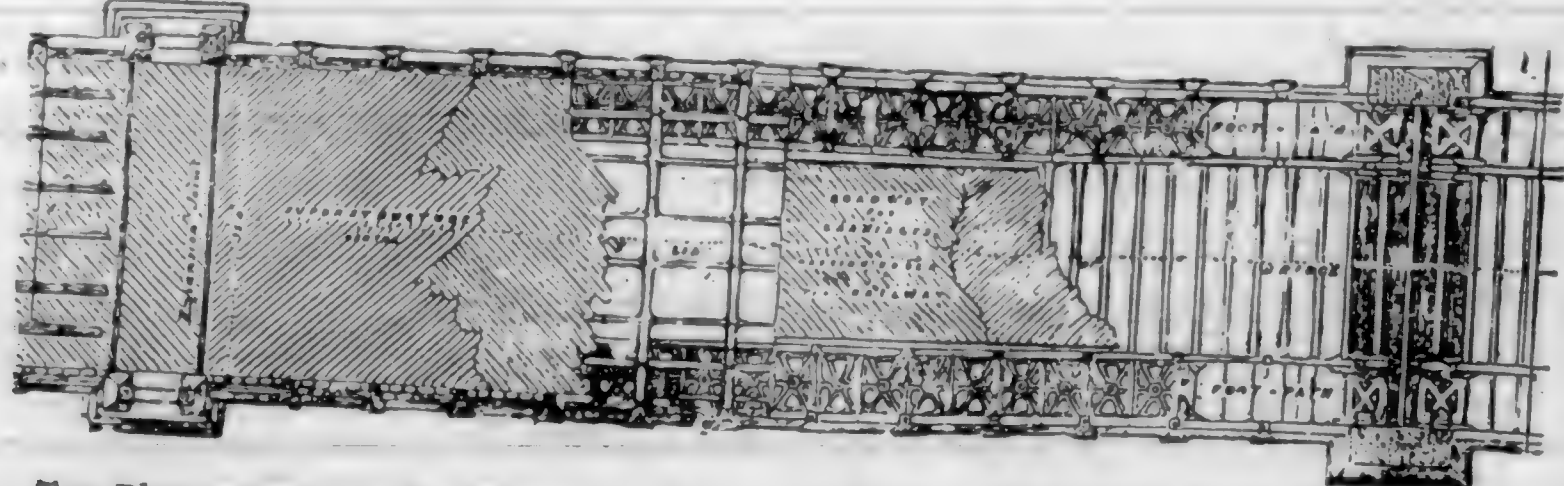
HIGH LEVEL BRIDGE AT NEWCASTLE.

The next example is the Crumlin Viaduct, which shows another fine truss on the same principle. It consists of 10 spans of 100 to 150 feet, and is carried on piers formed of hollow cast iron columns, 12 inches in diameter, braced together in sections of 17

feet each in length. The trusses are of wrought iron, and are 14 feet 6 inches in depth. The roadway is carried on the upper string of this example, but placed on the lower string of the Newark Dyke Bridge. The next example, is the

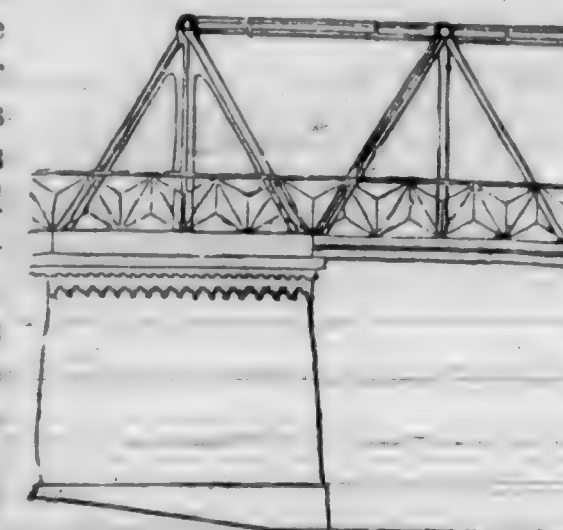


Saltash Bridge, which was erected by Brunell. It is known by the name of "Fish" girder, on account of the construction of the truss which is formed by reversed segments of circles of cast and wrought iron plating connected by vertical and diagonal bracing to which the roadway is suspended. It is, however, less economical than the forms of girders founded on the Warren type, and so has had no children. The next example, shows an example of a wrought iron arch bridge over the Rhine at Coblenz. But it is of no greater span, nor so economical in construction as the preceding forms of girders, and hence cannot compete with them in universal adoption. The next example, shows the Fink type of truss. In this girder each division comprises a separate and distinct truss, all combined in one by the boom or horizontal tie which supports the roadway of the structure. It is composed wholly of vertical cast iron struts, inclined wrought iron braces, and one horizontal tie. It is a worthy competitor of the Warren girder as regards economy, but is less pleasing in form.



Top Plate represents the Elevation of Bowstring Arch High Level Bridge New Castle.
Lower Plate is the plan of High Level Bridge, New Castle.

The Niagara Suspension Bridge, is the next example. It crosses the Niagara River some distance below the falls at a height of 245 feet above the water by a single span of 821 feet, 6 inches. The main structure is a hollow rectangular box. The steam cars traverse the upper surface, while the carriages pass through the tube. The walls are formed of double vertical timbers with wrought iron diagonal bars crossing between them. The railway or upper floor is carried by two wire cables, while the carriage way or lower floor is carried by two others, four in all. The total sectional area of iron is 241½ square inches. This bridge was commenced in 1852, and open for traffic in 1855. It was designed and built by Roebling, and cost £80,000. The use of the two cables of differ-



FINK TRUSS.

NEWARK DYKE BRIDGE.



NIAGARA SUSPENSION BRIDGE.

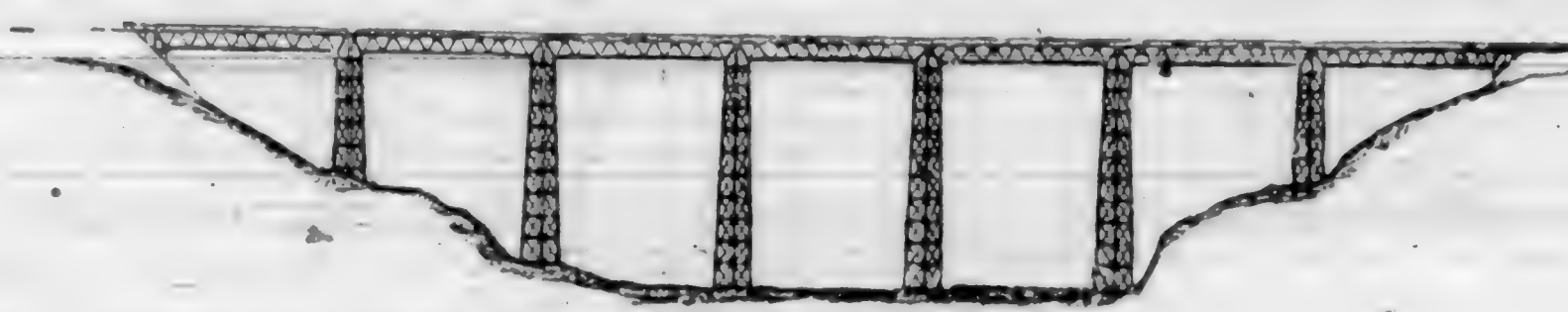
bolted together and braced laterally and connected by wrought iron couplings, which were found better for the purpose than steel. The tubular ribs are in sections 12 to 13 feet long, and from 1½ to 2½ inches in thickness. It is designed to carry a double railway below, and foot passengers above.

The next example, shows the great Garabit Viaduct, lately erected by Mr. Eiffel. It is a combination of a wrought iron lattice arch carrying a lattice trussed girder. It is of great height, 640 feet span, and a very masterly work. It was built by means of suspension cables, very much on the same principle, but by different methods to that adopted in the fourth bridge shortly to be noticed, viz., without scaffolding.

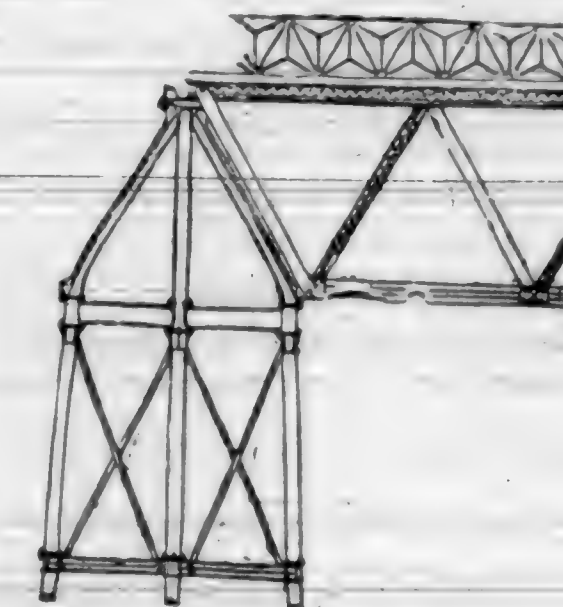


ARCH BRIDGE AT COBLENTZ.

The Brooklyn Bridge, of which I here produce an illustration, is the next great work to notice. It is 1,900 feet between supports, with piers 320 feet high, and is 250 feet above the



CRUMLIN VIADUCT.

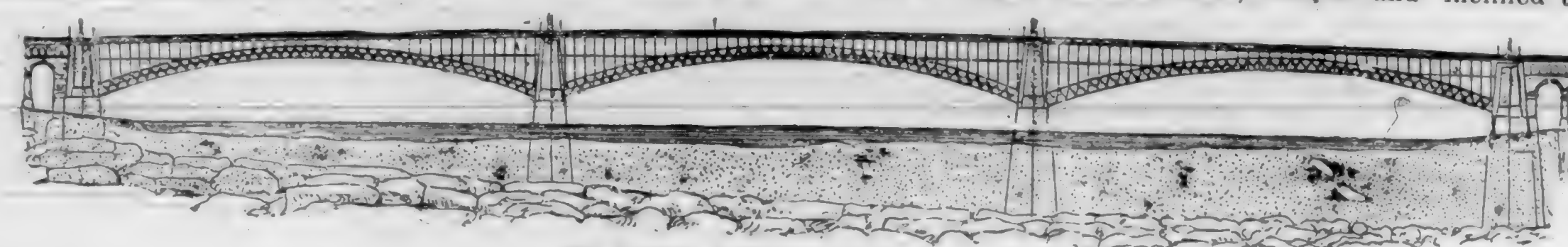


PART OF CRUMLIN VIADUCT.

East River. It is a mighty structure, and a during and wonderful achievement. It also is a combination of tubular truss to secure lateral stiffness, with suspension cables as supporting agents. Cable cars, carriage roads and foot passenger ways are provided, and the whole constitutes one of the great-

est of the many magnificent undertakings brought to a successful accomplishment in recent years.

The Firth of Forth Cantilever Bridge is another structure of immense proportions, and of great complexity, being a combination of wrought iron arch-tubes, vertical and inclined tubular



ST. LOUIS AND ILLINOIS Bridge.

columns or posts, inclined inward, double suspension bearings latticed together, and great latticed catenaries supporting a continuous box girder-tube which passes through the whole, carrying the railway track. The span is 1,710 feet, besides the side approaches. It is constructed on the stable equilibrium principle, and is wholly built of steel without scaffolding. It is without question the most stupendous structure of the kind in the world, and will

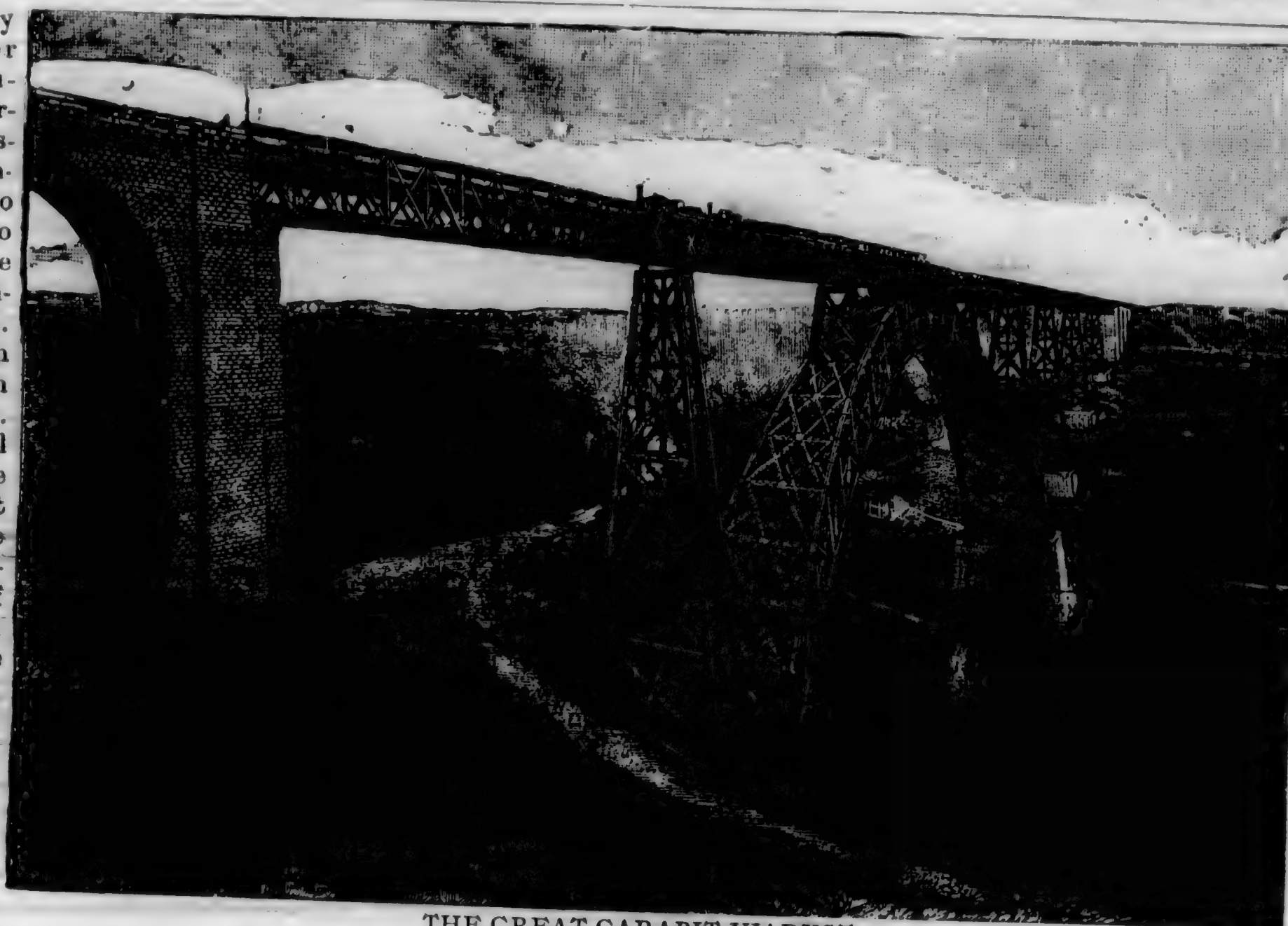
scarcely be blown down like the Tay Bridge, in 1886. The above structure is a combination of arch and catenary, with the lattice principle. It is constructed by building out piece by piece from each side of the central supporting piers. It in fact provides its own scaffolding, and grows by gradual accretion of balanced parts as a tree does, and on the same principle, thus indicating a closer and closer return to nature by man as he

siduously studies her divinely economic processes, or rather those of the divinely infinite Author of him and her. Nevertheless, the apparent striking disproportion between means employed and ends subserved is so manifest in this structure as to suggest grave doubts as to the soundness of some of the principles of design employed therein.

The next example here shown you is the proposed great North River Bridge at New York. This enormous but beautiful structure as designed, will be fully twice as large as the great Brooklyn Bridge. It is to be 2,820 feet span between supports. The towers will be of steel, and 620 feet in height. It will cost \$40,000,000, while the former cost only \$5,000,000. The bridge itself is formed of latticed girders carried on latticed cables. The whole promises to be the grandest single span structure that has yet been conceived.

It will be seen that in each of the above structures, while the technical, the utilitarian, the objective qualifications have in every case almost wholly governed the design, the result has also partaken of the higher aesthetic ornamental and artistic qualities in a remarkable degree. From the straight simple barlike effect of the Britannia Bridge, imposing from its magnitudes and simplicity, to the great, sweeping curve of the catenaries of the proposed North River bridge, each design has presented features and combinations of features clearly expressed and resulting in a peculiar beauty which no mere architectural accessory could in any way produce. Not one of these designs depends for its effectiveness on any purely architectural detail as usually understood, but it is due entirely to the proper distribution of parts in the most efficient way that could, at the time, be reasoned out for the proper attainment of the object in hand. This we have to insist on again and again. It is the iron rule which can never be broken without departing from true principle, and with unhappy results to the beauty of the structure concerned, from the designing of the simplest moulding to the construction of a cathedral, the erection of a bridge, or the building of a ship. It is the one paramount law in Art and Science, as imperative in such an apparently variable and volatile thing as a lady's bonnet, as in the construction of that useful, beautiful and significant thing, the steam engine.

To evince the truth of this proposition we will present one more well known, nay, perhaps, in past times, somewhat hackneyed example, to close this series of illustrations of the very imperfect remarks to which you have so kindly and forbearingly listened. I allude to the one great, significant, and really original building of the century. The conception of no professional archi-

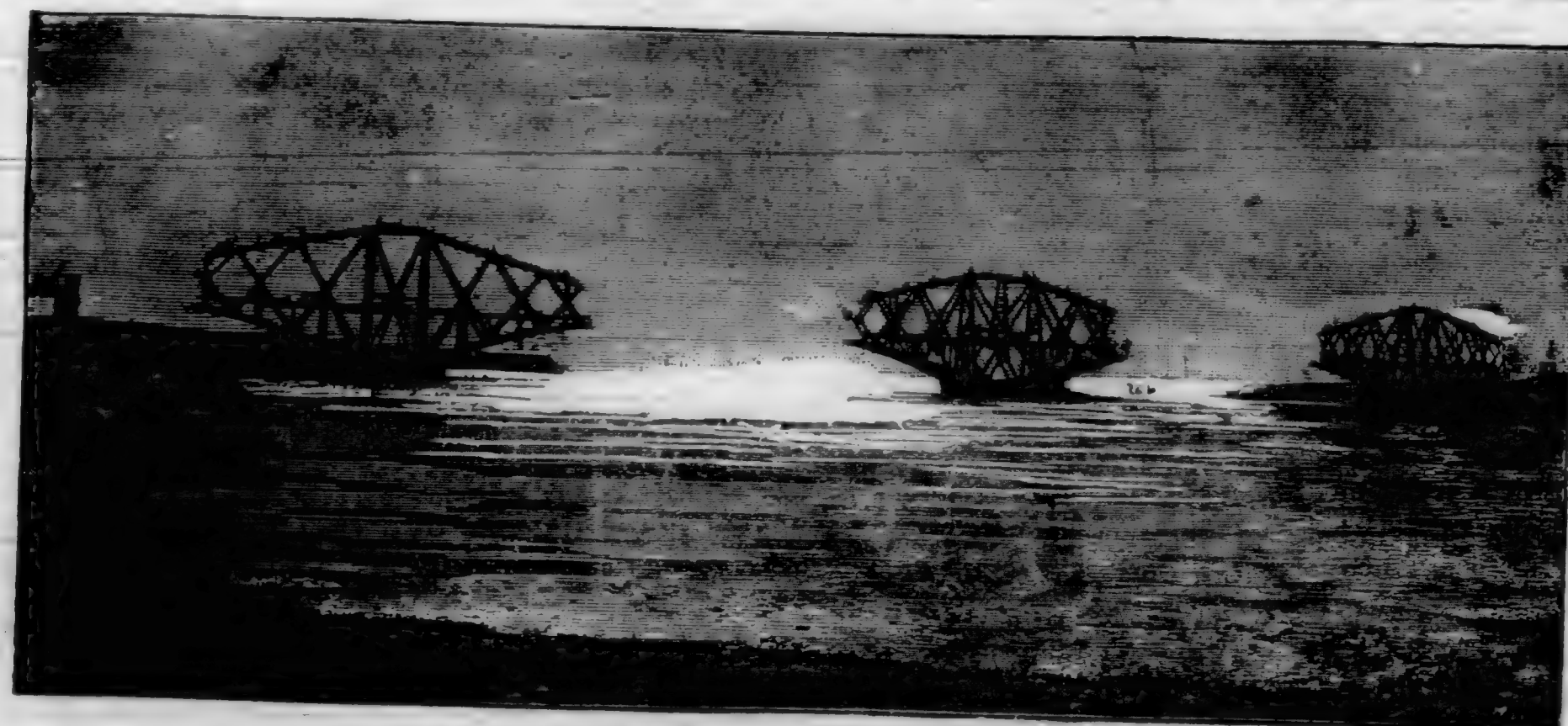


THE GREAT GARABIT VIADUCT.

tect, for no architect out of 245 who competed for it, proved equal to the task; of no builder, for none were found in the length and breadth of England who could suggest such a structure; but of a mere gardener, a constructor of green houses;—I allude of course, to the Great Exhibition Building of 1851. Truly great it was, and greatest, even, it will remain, until once again the exigencies of the occasion shall override mere precedent, and some future gardener shall produce as glorious a flower from as small a seed, simply by yielding unquestioning obedience to the needs of the occasion, unfettered by rule or any existing order of things which could in any way interfere with or encumber pure utility. The design sprang into being, and the world of that day was both astonished and delighted. It is said that when all the designs for the Great Exhibition of '51 had been received, classified and inspected, and the commissioners, rejecting them all, had concocted one of their own, apparently as unsuitable for the purpose, as any one of them all, Joseph Paxton, chief gardener to the Duke of Devonshire, sat down in his office and in half an hour sketched out his design for the proposed building on a sheet of foolscap. Submitting his idea to one of the Commissioners, he was encouraged to perfect it. The design was published and received the unanimous approval of the nation. The contractors, Fox & Henderson, in one week prepared drawings and estimates, and in four months from that date, 18 acres were covered with glass and iron in a structure, the quiet beauty, majestic simplicity, and the unapproached convenience of which has been from that day to this, absolutely unrivalled in buildings of the kind. Every building of the sort since designed, has had accessories of various kinds breaking up its mass by useless excrescences and architectural developments, until the fantastic structures have finally lost every characteristic which made the original design great. The accompanying views, show plan, elevations, and interior view and a few details.

The account of the designing, and construction of this building, reads like a fairy tale, in harmony with the fairy like structure which was the charming result.

Mr. Henderson, who made every important drawing with his own hand, working 18 hours a day for seven



FIRTH OF FORTH CANTILEVER BRIDGE.



FIRTH OF FORTH CANTILEVER BRIDGE.

weeks, says in a speech made about that time, that hundreds of tons of glass were provided, of an unprecedented size; thousands of columns, hundreds of girders 34 miles of guttering pipes connecting the columns, which conveyed the rain water to the ground, 205 miles of sash bars, and more than 1,000,000 feet of flooring, were produced by the various firms engaged in the work, in the short space of time which was allowed to execute it. The setting out of the structure, the placing of the base blocks on concrete filled into holes dug in the ground, the raising of the columns, the lifting of the girders and keying them into their proper places in the structure, etc., proceeded with unexampled accuracy and rapidity, and, the first of its kind, and unique in the history of

great expositions, the building was ready on the day when the contract expired. This was due to the entire simplicity and reduplication of every part of the structure, which again was due to the harmony of scale, which in this structure, as in the Parthenon and a few others, is perhaps after all, the most noticeable feature in the building.

Contemplating the excellent qualities exhibited by this great structure, which at the time of its erection, challenged the admiration of men of taste and judgment throughout the world, and in fact, elevated it to a level with the greatest edifices ever conceived by man, it is evident that it in no way differs in kind from any one of the great engineering works to which your attention has been directed above.



NORTH RIVER BRIDGE.

Adaptation of means to ends and that alone, in it, as in them, constitutes and includes all of its qualifications, and in this as in them, it is especially to be remarked that there is nothing imitated. No attempt is made to transfer to one material the appearance or proportions appropriate to another. On the contrary, each material is in its turn treated on its own merits, and hence its value is thereby enhanced in proportion. It is just as though the whole structure to its minutest part, was represented by two sets of figures, indicating in the first place the intrinsic value, in the other the value in application, and that both sets of

figures in every case, were identical. In how many structures of the kind, erected before or since, can this be said to have been attained. In other words, that every material throughout the structure should be so applied as to attain the greatest measure of utility it is capable of, with the least expenditure of material compatible with safety, and with the best artistic effect. Would it be by adopting the forms and construction appropriate to some other and very different materials? to make iron resemble stone, for instance, or wood iron or vice versa? It is evident that there must be in such a case a great and useless waste of labor as