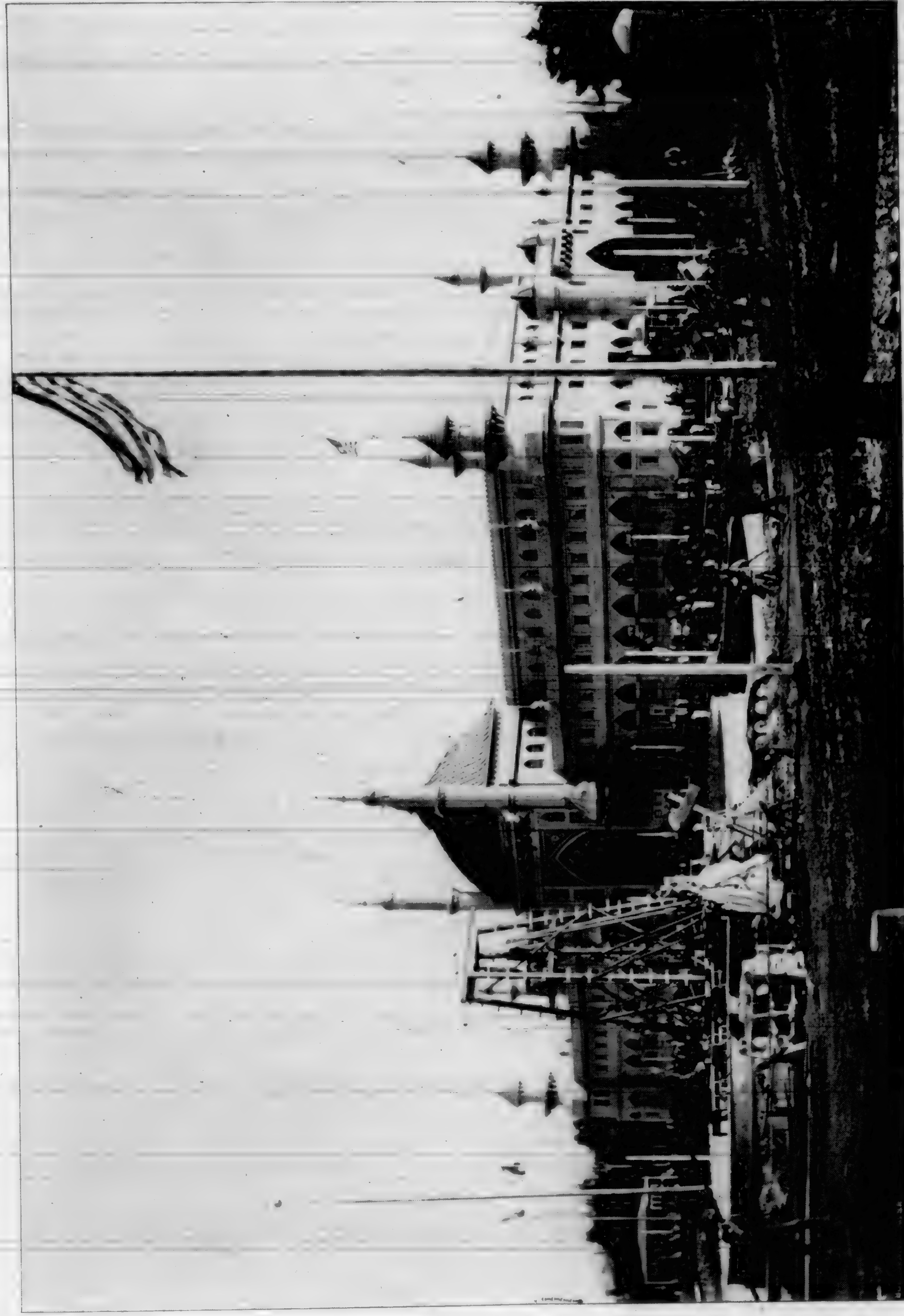
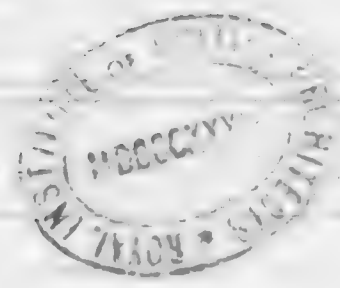




MECHANICAL ARTS BUILDING.

CALIFORNIA MIDWINTER INTERNATIONAL EXPOSITION.

HURLETT & LOGAN, CONTRACTORS.

E. R. SWAIN, ARCHITECT.

CALIFORNIA ARCHITECT AND BUILDING NEWS.
SAN FRANCISCO.

VOL. XV. No. 1. JANUARY 1894

We have received the initial number of a new monthly periodical called, **THE ARCHITECT AND BUILDER**, published by H. T. Bestor at 408 California street.

The publication presents a very neat appearance and is to be devoted to Architecture, Building, General Improvements and the Fire Department. The subscription price is \$2.50 a year.

Besides the opening chapters of a paper on the History of Architecture, there is a very interesting article on the recent pilgrimage of the Veteran Volunteer Firemen of California to the east, where they were royally entertained, and returned from their visit with memories of a most enjoyable vacation.

We wish the new publication long life and prosperity.

PHOTOGRAPHIC TIMES has a Christmas number that is a pleasure to look at, among other good illustrations snap shots in the south cannot fail to please both old and young. In giving Mrs. E. Main a place among the distinguished photographers of to-day the illustration "Along the Mountain Road" and other views in Switzerland will convince the reader that Mrs. Main has not been misplaced.

Astromical Photography at the Lick Observatory by Prof. E. S. Holden will interest astronomers.

ECONOMY IN SLATE ROOFS.

THE San Francisco Slate Company is striving to convince the public of the practical economy of building in a permanent and substantial manner. While the first cost of a cheap roof is say one-half the cost of a good one, yet if the latter last four times as long as the former, who can deny the economy of the latter method. A tin roof requires constant care and attention and if left too long without paint will rust and ruin in a short time; a shingle roof exposed to the summer sun will warp and split, and the heat drying the pores of the wood renders it very inflammable.

A burning brand on a shingle roof is a great danger, let the same fall on a slate roof and no harm results. But a slate roof, from its very nature, is permanent, and as it is economy in the long run to procure the best article to be had; so when you are considering that most important of all elevated subjects, decide in the favor of a slate roof and you may safely consider yourself above criticism.

THE PARK COMMISSIONERS.

WE had occasion in a late number of this journal to speak of the Park Commissioners as gentlemen who had the faculty of making a little money go a great way in the way of improvements at the park. Now they have proved themselves to have the same faculty in the way of giving the children a day of enjoyment and the use of the park and play grounds, by inducing the railroad company to send and return the children free, enabling thousands of children to enjoy a day of recreation that will long be remembered by many. Thus the surplus derived from the playground was certainly made to go a great way, and do a great deal of good.

LEGAL DECISIONS.

From a large number of Legal Decisions of the higher Court, of the different States of the Union, we select and publish in this column, such as appear applicable to this section of the country.

CONSTRUCTION OF CONTRACT AS TO PARTY WALLS.—Where one erected a wall partly on his lot and partly on an adjoining lot, under an agreement with the then owner, by which the wall was to be mutually used and enjoyed by the respective parties hereto, and their respective heirs, successors, and assigns, for all the purposes of a party wall. One half of the cost of the wall was to be paid by the adjoining owner when it should use the wall. The contract further provided that if the adjoining owner should at any time elect, that it would not use the wall, then it should convey for a certain sum, so much of its lot as the wall occupied. The wall was a party wall under the agreement, and its character could not be altered by a failure to make the election.

Cutting v. Stokes, Supreme Court of N. Y. 25 N. Y. Supp. 365. 128.

DELAY IN PERFORMANCE OF BUILDING CONTRACT.—The fact that a builder of a house does not terminate the contract with a subcontractor for the failure of the latter to complete his work within the time specified, does not prevent the builder from recovering by way of counterclaim, damages for the delay. A builder who has failed, to complete, in time, work which was required to be done, on his part, before the work of a sub-contractor could be commenced, cannot complain that the sub-contractor failed to complete his work within the time specified in the contract.

Grannis vs. Hurd Lumber Co. v. Deeves, Supreme Court of N. Y., 22 N. Y. Supp. 375. 94.

FORCLOSURE OF MECHANIC'S LIENS.—When a building contract stipulates that the architect's certificate shall be conclusive evidence of the builder's right to a final judgment, and the certificate is produced, and not impeached, there is no reason to deny foreclosure of the lien.

Snaith v. Smith, City Court of N. Y. 25 N. Y. Supp. 513. 42.

ABANDONMENT OF CONTRACT.—A building contract provided for payments to the contractor every thirty days, in such sum as shall be certified by the architect, but twenty per cent shall be retained until the final completion of the contract. The contractors abandoned the work, and it was completed by the owners. The sum retained by the owner never became due the contractor, and there was nothing in which a material man's lien filed after the abandonment by the contractor could attach.

Kelly v. Bloomingdale, Court of Appeals of N. Y. 34 N. E. Rep. 919. 79.

COVENANT IN AGREEMENT FOR PARTY WALL.—The adjoining owners of a party wall and the land covered by it have each an easement in that portion owned by the owner, by virtue of the party wall contract which runs with the land, but this is entirely independent of the original cost or expense incurred in erecting it. It is competent for the parties to provide how, when, and to whom the cost of his portion should be paid by either party, and to make the covenant to pay, a mere personal covenant, with the covenantee, and severable from his ownership of the land.

Pillsbury v. Morris, Supreme Court of Minn. 56 N. W. Rep. 171. 93.

INSURABLE INTEREST IN BUILDINGS IN COURSE OF CONSTRUCTION.—The owner of land has an insurable interest in buildings in process of construction thereon by a contractor who is to furnish all materials and labor, and be paid after completion of the work.

Foley v. Farragut Fire Insurance Co. Supreme court of N. Y. 24 N. Y. Supp. 1131. 42.

CONSTRUCTION OF BUILDING CONTRACT.—A contract to repair an old building and build an addition, the old part to be turned around, stipulated a certain sum for the whole work, to be paid as follows: "Old part placed in position, \$200; foundation in and frame up, \$300; inclosed and roof on, chimneys up and the building completed according to agreement, and specifications, \$300." The work on the new part not being in condition to entitle the contractor to the third installment, when the building was destroyed by fire, no recovery on such installment could be had for work on the old part, though that was substantially completed, the contract being an entirety. The second coat of paint not having been put on the new part two doors not having been hung, and no lock or fastenings having been put on the front door or windows, and the house not having been delivered to the owner, it was not substantially completed.

Clark v. Collier, Supreme Court of California, Pac. Rep. 677. 611.

NOTICE OF MEETINGS.

SAN FRANCISCO CHAPTER, AMERICAN INSTITUTE OF ARCHITECTS, meets second Friday of each month at 408 California street.
 SETH BABSON, Pres. GEO. W. PERCY, Vice-Pres.
 OLIVER EVERETT, Sec. JOHN M. CURTIS, Treas.

TECHNICAL SOCIETY OF THE PACIFIC COAST, meets first Friday of each month at Academy of Sciences Building.
 C. E. GRUNSKY, Pres. CHARLES D. MARX, Vice-Pres.
 OTTO VON GELDERN, Sec. GEO. F. SCHILD, Treas.

CALIFORNIA ELECTRICAL SOCIETY, meets the first and third Monday evenings of each month at the Academy of Sciences Building.
 GEO. P. LOW, Pres. C. O. POOLE, Vice-Pres.
 MAX CASPARI, Sec. H. T. BESTOR, Treas.

THE regular monthly meeting of the San Francisco Chapter of the American Institute of Architects was held on the afternoon of the 12th inst. in the rooms of the Society, 408 California street.

The Executive Committee reported that it had secured the promise of four papers on as many subjects, which would be read during the course of the year and which, it was hoped, would furnish interesting topics of discussion for members present, and cause an interchange of the ideas and experiences of the professional brethren.

The first paper will be by Geo. W. Percy, on the subject of the Use of Concrete in Architecture, its Successes and its Failures, and will be read on February 9th.

Members of the Chapter will receive the usual notice. Other persons interested in the subject are requested to procure admission tickets from the president, Mr. Seth Babson, 408 California street.

CALIFORNIA MIDWINTER EXPOSITION

AND A DESCRIPTION OF THE WORK DONE AND MATERIAL FURNISHED TO MAKE IT A NOTABLE SUCCESS.

THE formal opening of the California International Midwinter Exposition will take place with the appearance of this number of the CALIFORNIA ARCHITECT AND BUILDING NEWS. The event is a notable one in the annals of the state, and one that will long be remembered by our own citizens and those visitors who will desert the rigorous climate of the eastern states to enjoy the equitable climate and proverbial hospitality of the Golden State. A few words of commendation can well be bestowed upon those individuals and firms who have by their individual support and assistance, rendered these results possible and we take pleasure in awarding them the credit their exertions so fully merit.

THE Midwinter Fair owes a great part of its success, if not the greatest part of this success, to the skill, courage and perseverance of the contractor who built the beautiful structures to house the exhibits.

As it was absolutely essential that the buildings should be ready on time, it was necessary that the contractors should bind themselves to forfeit hundreds of dollars a day

THE PORTLAND CEMENTS, "JOSSON" AND "NORTH".

AMONG the most notable of the improvements of modern times ranks the discovery and production of Portland Cement. This cement is not named for any particular place where manufactured but was so christened on account of the close resemblance that the artificial stone made with it, bore to Portland stone.

The various brands now on the market are the results of a long course of experiments, resulting in improving the quality, and establishing the uniformity of recognized brands.

The best proof of these qualities may be sought in the experience of architects, engineers and builders.

When a particular brand of cement is chosen over others in open market, the reason is that the purchaser has found by experience that the brand he chooses possesses quality that make it more desirable than other brands. For example when the United States Government employs 85,000 barrels of cement manufactured by a particular firm, it is good proof that the cement is one to give satisfaction.

This amount of "Josson" and "North" Cement has been used in the construction of fortifications on the Pacific Coast, principally at Lime Point and North Point in San Francisco Harbor, and at the Cascades in Oregon.

A supply of these brands is received every month, and purchasers are thus assured of fresh cement, that has lost none of its strength by months of storage in warehouses.

A TENANT went to see his landlord about a house he had rented, and about which he had some fault to find. He mentioned several drawbacks, and then said: "And furthermore, Mr. Oppenheimer, the cellar is full of water." "Mr. Oppenheimer, the landlord, eyed him with reproach, and then exclaimed: "Full of water? Well, vat you expect? Full of champagne?"—*Harper's Bazar*.

for every day's delay in the completion of the buildings beyond the limited time allowed. Under these circumstances it required a deal of nerve to step forward and offer to assume the heavy burdens and serious responsibilities inseparably connected with the enterprise. Unknown difficulties could be counted on to arise, with the certainty that delay would be fatal. Nevertheless the builders of this city eagerly welcomed the opportunity of showing to the people of the state that they were equal to any contingency that might arise, and there was certainly no lack of bidders for the work.

Smilie Brothers were the successful contractors to whom was awarded the contract for the construction of the Manufacturers and Liberal Arts Building, the largest of the buildings, and night and day for many weeks pushed the work to final completion; for when the light of day was no longer available, electricity, the light of night, was called into service; and thus the Californians of a later day showed the pioneers that the push and energy of early days had descended unimpaired to present times and in the realization of this fact there is quite as much satisfaction, as in the enjoyment of the more substantial profits coming there from.

THE SAN FRANCISCO LUMBER COMPANY.

THE buildings that form the principal architectural attraction of the Midwinter Fair, are with one exception of wooden construction, covered with staff. An immense quantity of lumber necessarily entered into their construction, and yet this one firm alone in this city furnished more than two-thirds of the amount required.

This firm was incorporated in May, 1887, and the officers and directors are as follows:—W. J. Adams, Pres.; C. S.

explain why they are able to furnish any amount of lumber as soon as the order is received.

While the above description will give our readers an idea of the extent of the business, the accompanying illustrations will be of interest, showing as they do their yard at Fourth and Channel streets, San Francisco, their mills at Tacoma, Port Blakely, Port Gamble and Port Hadlock, Washington, four out of the nine mills controlled by the company.

The extent of the trade can be imagined when we state that there is no country in the civilized world but what



PORT HADLOCK
PORT BLAKELY

SAN FRANCISCO LUMBER CO'S YARD,
FOURTH AND CHANNEL STREETS, SAN FRANCISCO.

TACOMA MILL
PORT GAMBLE

Holmes, Vice-Pres.; W. H. Talbot, Treas.; Chas. Hanson, A. W. Jackson, A. D. Moore, R. L. Taylor, Directors; James Greig, Sec.; J. N. Curtis, General Manager.

This company and its connections outside of San Francisco, generously responded to the appeal of the promoters of the Fair, and devoted outright five hundred thousand feet of lumber for use in the buildings. The enormous stock of lumber carried by this company can be readily imagined, when we say that in their yards at the foot of Third street and at Fourth and Channel streets, are stacked twenty million feet of pine and ten million feet of redwood.

This immense stock enables them to fill orders for any size and kind of timber, without the least delay, and will

purchases the products of these mills. However the principal foreign countries with which the largest proportion of the business is carried on, are Australia, Chili, Peru and The Hawaiian Islands, while the trade in this country takes in the entire Pacific Coast.

Besides the millions of feet of lumber kept in stock to meet the demands of the local market, the company keeps a complete list of dry, clear and surface redwood and Humboldt shingles for eastern shipment.

Their place of business uptown is at 303 Montgomery street, and their offices and yards are situated, one at the foot of Third street and the other at Fourth and Channel streets.

WESTERN IRON WORKS.

THE lightening rapidity with which events take place in this latter part of the 19th Century, was never better illustrated than at present, at our own doors, and by our own people. Think of an exposition, international in character, conceived, elaborated and carried to completion within the space of six months; yet that is what we have just witnessed, and we are becoming so accustomed to the marvelous that it will soon fail to excite surprise.

Think of the capacity for organization that is required; the rapid and intelligent thought, supplemented by as rapid execution. Every detail to be thought of, and men and means provided for its realization.

The general public see and applaud the results. The scientific mind realizes the strain that is necessary to foresee obstacles and provide in advance the means to be employed in overriding them.

The delay of an hour in the arrival of reinforcements in a battle means defeat—the delay of a day in the arrival of the necessary material for a building, causes quite as serious consequences in the progress of the work, and if when it comes it does not come in proper shape to fit to a nicety, everything is thrown into confusion. No such possibilities can be admitted in work of the magnitude of the buildings we now see before us, in the Midwinter Fair, and such confidence had the contractors in their resources, that they bound themselves by a forfeit of \$400 per day for any delay.

Under such circumstances no chances of failure could be taken, and as in instance of good judgment in this regard, we will instance the iron work used in the combination trusses and girders of the Mechanical Arts building designed by E. R. Swain, architect, and of the Fine Arts building designed by C. C. McDougall & Son, architects.

This work had to be delivered early in the course of construction, and to have it ready on time the large establishment of Sims & Morris worked day and night. Notwithstanding the haste, however, everything was ready promptly, and \$15,000 worth of work when wanted was found to fit to a hair. By such care and attention to details The Western Iron Works, Sims & Morris, have reached their present high standing, and they can safely be relied on to continue in the way that has led them to such business success. Their address is 123-125 Beale street.

ARTISTIC DECORATION AND PAINTING.

AFTER the construction of the buildings of themselves the next most important point is their decoration in a fitting manner. The points of beauty should be made more attractive by color, and from this point of view the buildings surpass those of the White City.

Fraser & Keefe, one of our oldest and best known firms, have carried out the ideas, in this respect, of the designers of some of the main exhibition buildings, and the artistic work done on the Manufacturers and Liberal Arts Building, the Mechanical Arts Building and the gilding on the Fine Arts Building, secured them various other contracts, notably the decoration of the Cairo and Oriental Concessions and the Festival Hall. Messrs. Fraser & Keefe personally supervised this branch of the work, and it will be interesting for our many readers who will admire their work during the next six months, to know whose taste and skill they are indebted to for the pleasure.

As the best method of expressing our appreciation of good work is to patronize the workman, make a mental note that the address of Messrs. Fraser & Keefe is 310 Stockton street, San Francisco.

FRESCO PAINTING AND INTERIOR ART DECORATING.

NO matter how well a building is planned and constructed, all will acknowledge that unless good taste in designing and good judgment in the execution of the design of decorating and ornamenting, the full effect may be lost, and the result fall far short of what the architect intended to produce. A. Page Brown, architect of the Administration Building, may therefore congratulate himself upon having Messrs. Moretti & Trezzini, fresco painters and interior art decorators, employed for that purpose. We feel sure that upon the completion of their work upon the building, the verdict of the public will be unanimous in declaring that the interior of this stately and imposing building has gained much by having the work intrusted to such skillful hands as Moretti & Trezzini's. Among the many buildings that they have decorated may be mentioned the following:—St. Ignatius Church, St. Mary's Cathedral, of this city, Macdonough Theatre in Oakland, also most of the best residences and banks in this city. Their fame in fact extends all over the coast from Portland to Los Angeles.

EXHIBIT OF THE JOSHUA HENDY MACHINE WORKS AT THE MIDWINTER EXPOSITION.

AMONG the exhibits which are to be placed in practical operation in the Mechanical Arts Building at the California International Midwinter Exposition in Golden Gate Park, we are informed that the Joshua Hendy Machine Works of 51 Fremont street, this city, have in process of construction and erection, a five (5) stamp quartz mill complete with all of the latest and most approved forms of Hercules rock-breakers, Challenge ore feeders, Triumph ore concentrators, silver-plated copper plates and as well all of the usual accessories constituting an entire plant for the perfect amalgamation and concentration of gold bearing quartz ores.

They will also place on exhibition their specialties of hydraulic gravel elevators, giants, water-gates, air valves, hydraulic pipes, etc., as adopted in the conduct of hydraulic mining enterprises in all of the placer mining districts of the world.

In conjunction with their exhibit of Quartz Milling Machinery there will be presented a complete line of horse-whims for the raising of ores from mines in the early stages of their development, also ore buckets, mining cars, etc.

They will further place in operation a Russell Automatic and an Ore and Sower engine for use as power in certain of the departments of the Exposition for the sale of which they are the agents for the Pacific Coast States.

It is deemed proper to state that we are credibly informed that these works were awarded the highest premiums by Award Committees of the Columbian International Exposition at Chicago for their display of ore-feeders, Triumph concentrators, Hydraulic Gravel Elevators, Giants, etc., such as are enumerated above in the proposed exhibit at the Exposition to be held in this city.

An examination of their extensive foundry plant and machinery works may be of interest to some of the persons who intend to visit the Midwinter Exposition, situated as they are conveniently near several street car lines on the corners of Bay, Kearny and Francisco streets in the vicinity of the seawall in the northern part of the city, where will be found a complete equipment for furnishing any description of machinery for any conditions of use and as well architectural iron work and light and heavy castings.

ON HOME INDUSTRIES AND INCIDENTALLY TOUCHING ON THE PRODUCTS OF THE PARAFFINE PAINT CO.

THE manufacturing industries of the Pacific Slope are few in number and small in proportion to the consuming power of the population it contains. The reasons for this are many, but they are now gradually disappearing under the spirit of enterprise and independence which is taking possession of the west. Of late years there has been a tendency on the part of live citizens to aid and encourage such manufacturing concerns as ventured into the field, by giving preference to their products. In Colorado, the Board of Trade of Denver, adapted a label which certified that the contents of the package on which it was placed, was of home manufacture and they appealed to the citizens of that state to give such articles preference wherever and whenever possible—and report says that the people have generously responded to the advantage of all concerned. In other states of the west the same has been tried with varying success.

In California no organized attempt has been made up to the present time to give home products the preference, though it has on several occasions, been suggested. At the same time, however, there is a strong feeling being developed that home manufacturers should be encouraged in every legitimate way provided, of course, that their quality is up to the standard, and their price reasonable. This is the right spirit and it is no injustice to eastern manufacturers, to ask the people of the west for support for home enterprises.

Among the manufacturers of California, the Paraffine Paint Co. of San Francisco, is of special interest to the architects and builders of the state. A few years ago building papers and patent roofings were almost unknown west of the rocky mountains. In the east, building papers were extensively used, and were deemed essential to the proper construction of frame dwellings, but here the genial climate and short rainy season did not seem to warrant such additional expense. Under adverse circumstances, then, began the Paraffine Paint Co. its work of introduction and education. Thousands of dollars were spent in advertising and drumming up trade, but the architects were conservative and the owners and builders obstructive. Finally the entering wedge was driven—and to-day not a house of any pretension is constructed without building paper. Though cheap eastern papers have at times flooded the market—yet P. & B. papers have captured and held the field by reason of their superior qualities and reasonable prices. These papers are entirely of home manufacture. In the construction of the cold storage rooms of the packing houses at Rodeo and Baden over a million and a half square feet of P. & B. paper were used for insulation. As these buildings were designed

by eastern architects, familiar with building papers, the selection of P. & B. Paper by them was a high testimonial of the merits of the home product.

P. & B. Roofing, was for a long time, regarded with suspicion, but now after being subjected to severe tests for years, it is being specified and used by leading architects as a substitute for tin and asphaltum. Its cheapness, durability and fire-resisting qualities have compelled this recognition. A strong argument in favor of the encouragement of home manufactures arises in the fact that the construction of the immense buildings at the Midwinter Fair would have been almost impossible without P. & B. Roofing. The canvas, coal tar and paper roofings used on the World's Fair Buildings at Chicago were a source of continual annoyance and danger, and the Executive Committee and Architects of the Midwinter Fair were determined not to use them. Tin was too expensive and in addition there was not enough of it in San Francisco to roof the proposed buildings. Shingles and slate were in a large measure unsuited to the

styles of architecture which the architects desired to use. It was then that P. & B. Roofing met its proper recognition—a Pacific Coast Roofing for a Pacific Coast Fair. The result is that nearly five hundred thousand square feet of P. & B. Roofing has been used to cover the main buildings, county buildings and buildings belonging to the Concessionary.

These roofs are watertight, virtually fire-proof, and permanent and would not have to be replaced if the committee should decide to let the buildings remain. Such a fire as has just occurred at the World's Fair Grounds, Chicago, is not possible at Golden Gate Park, the roofs will not take fire from sparks and burning brands, should they fall on them.

P. & B. Paint is of especial interest and value wherever it is necessary to protect iron or wood work from rust or decay. It is acid and alkali proof and leaves no taste or odor when dry. On the water main of the Portland City Water Works nearly ten thousand gallons will be used. The pipes which conveyed the Hygia Mineral Water from Waukesha, Wisconsin, to World's Fair Grounds, Chicago, a distance of one hundred and thirty miles, were coated with P. & B. Paint. There are other P. & B. Products which have established reputations both here and in the east. P. & B. Insulating Company, which won a gold medal at the World's Fair, is required by the Pacific Fire Insurance Union to be used in the installation of electric wires. Many fires have been prevented by its insulating properties and many more would have never happened had the electrician known his business, or been honest. Everything used in the manufacture of P. & B. goods is of Pacific Coast production—and they are probably the only goods of which that can be truly said. In giving them the preference, a large amount of money which would otherwise go to eastern and foreign manufacturers and railroads is retained at home to the manifest benefit of all concerned.



PAINT FACTORY AND STORAGE SHEDS OF PARAFFINE PAINT CO., AT BERKELEY, CAL.

AMERICAN WIRE GLASS MANUFACTURING COMPANY.

WIRE Glass, as its name implies, consists of a sheet of glass (which can be made by our process of any size or thickness) having imbedded in its centre a sheet of wire netting of any required size of mesh, or wire, or of any desired design. It can be made of any grade, from rough skylight up to the best polished plate. The advantages of this combination of metal and glass over the ordinary glass for most purposes are manifold.

For skylights in train sheds, this glass fills a long-felt want. It is a great deal stronger than ordinary skylight, enabling thinner glass to be used, or larger sheets, thus reducing weights in the roof. The wire netting which is now stretched under or over most skylights to protect passengers from dropping glass, can be entirely dispensed with, thus saving not only a large initial, but also the continual expense of replacing the wire netting, which is quickly eaten away by the sulphurous gases and steam from the locomotives. Our wire netting, being placed in the centre of the glass, cannot be reached by the gases of the atmosphere, and will of course last as long as the building itself. As is well known, glass when kept clean will transmit a great deal more light than when covered with soot and dirt; which will unavoidably accumulate in buildings used for this purpose. With the wire netting tacked underneath or above, it is very difficult to clean the glass, and this is therefore most always neglected. Wire glass, as is self-evident, can be readily cleaned, and when kept in this clean state many less lights would be required to have the same lighting effect.

Wire Glass resists fire as long as the same thickness of iron would. This quality makes it very useful for partitions in buildings. A skylight which will not crack and fall out at once in case of fire, and thus cause strong upward drafts, which aid the conflagration, will retard the progress of the fire at the start, when every second of time is of the utmost value.

Wire Glass has been ordered and is now being used in the train sheds of the Penn. Railroad, at Broad street, Phila.; Mantua Avenue Station, train sheds and Kensington Station, Pennsylvania Railroad; Grand Central Station, New York City; train sheds of the Boston and Main Railroad, Boston, Mass., the latter sheds contain an area of three and one-half acres of glass and is the largest single order for skylight glass ever placed in this country; New Congressional Library, Wash., D. C.; Post Office Bldg., Scranton, Pa.; Post Office Bldg., New York City; Newark Post Office, Newark, N. J.; the U. S. Cruiser New York; observatory taken out by Lieutenant Peary to the Arctic regions, and in countless other buildings not here enumerated.

In this city Wire Glass has been used in the *Mechanical Arts and the Horticultural and Agricultural Buildings of the Midwinter Fair*; in the Bath and Boiler House of the Olympic Salt Water Co.; in the new Bohemian Club, and has been specified for use in the two large Parrott Buildings, now being erected, one on the corner of Post and Powell streets, and the other on Market street. Other large contracts are now being figured on, to early to mention.

Any architect, contractor or builder desiring samples or other information can secure the same from the agent, Mr. Jas. A. Maguire, 130 Sansome street, San Francisco.

CITY BUILDING NEWS.

Ash Ave. near Octavia street. A two-story building; owner, B. Bernhard; architect, Edward J. Vogel; contractor, F. V. Steinman; signed, Dec. 15; filed, Dec. 15; cost \$2,500.

Baker and Sullivan Alley. Alteration and addition; owner, Estate of Jno. Sullivan; contractors, Ingerson & Gore; signed, Jan. 15; filed, Jan. 15; cost, \$3,920.

Carl and Stanton. Alterations and repairs; owner, Thomas Lund; architect, T. J. Welsh; contractor, James J. O'Brien; signed, Dec. 20; filed, Dec. 28; cost \$2200.

East near Mission. Excavating, etc.; owner, Claus Flatman; contractors, Henry, Tibbitts & Co.; signed, Dec. 18; filed, Dec. 18; cost \$7,500 a pile.

Elis and Mason. Incandescent electric light wiring; owners, Y. M. C. A.; architect, A. Page Brown; contractors, California Electrical Works; signed, Jan. 10; filed, Jan. 11; cost \$9,350.

Flint Tract. Alterations and additions; owner, B. Pehrsson; contractor, Carl Ahlgren; signed, Dec. 22; filed, Dec. 29; cost \$1150.

Florida near 22d. To build; owner, Geo. W. Werner; contractor, Henry P. Conrady; signed, Dec. 15; filed, Dec. 16; cost \$2800.

Fourth near Clement. A frame building; owner, Adolph Winterberg; contractors, Lyons & Boyer; signed, Nov. 24; filed, Dec. 19; cost \$2,000.

Golden Gate Park. Decorating, etc.; owners, Vienna Prater Co.; architect, E. Kollofrath; contractors, Bush & Wacker; signed, Dec. 28; filed, Dec. 29; cost \$3000.

Golden Gate Park. All work except painting, plumbing, electric work, concrete hall and annex for kitchen, etc.; owners, Vienna Prater Co.; architects, Edward Kollofrath; contractors, Mahoney Bros.; signed, Dec. 23; filed, Dec. 23; cost \$27,800.

Golden Gate Park. A wooden wall and stable; owners, Oriental Syndicate; architect, Edward R. Swain; contractor, Thomas H. Day; signed, Dec. 22; filed, Dec. 26; cost \$2,550.

Golden Gate Park. Mill work and rough framing for Vienna Prater; architect, E. Kollofrath; contractors, Mahoney Bros.; signed, Dec. 27; filed, Dec. 28; cost \$2,402.

Golden Gate Park. Plumbing for a Concert Hall, etc.; owners, Vienna Prater Co.; architect, E. Kollofrath; contractor, Ickelheimer Bros.; signed, Dec. 28; filed, Dec. 28; cost \$1261.

Golden Gate Park. Electrical fountain; owner, Ex. Com. Cal. Midwinter Fair; contractor, J. M. Weir; signed, Dec. 23; filed, Dec. 28; cost \$1000.

Golden Gate Park. All work to build; owners, Cosmopolitan Restaurant Co.; architect, Ira Fancher; contractor, Geo. Cannon; signed, Dec. 13; filed, Dec. 15; cost \$3050.

Hayes near Webster. All work to build; owner, Peter Sullivan; architect, Henry T. Munson; contractor, David Ross; signed, Jan. 2; filed, Jan. 3; cost \$400.

Josephine and Point Lobos Ave. Concrete and asphaltum work; owners, Olympic Salt Water Co.; architect, E. Ernest Melliss; contractor, A. E. Buckman; signed, Dec. 27; filed, Jan. 9; cost 9 cents per sq. ft., for concrete and asphaltum 4 inch thick; 11 cents per sq. ft. for concrete and asphaltum 5 inch thick; 25 cents per sq. ft. for massive concrete 1 to 8 composition; 22 cents per sq. ft. massive and concrete 1 to 14 composition.

Kenny near Filbert. To build; owners, John or Giovanni Ghiglieri and Martin Segarini; architect, Chas. R. Wilson; contractor, E. Dalgero; signed, Jan. 11; filed, Jan. 12; cost \$6250.

Larkin street. Alterations and additions; owner, Fred and Kate Lumblade; contractor, J. G. Chase; signed, Jan. 2; filed, Jan. 3; cost \$1065.

Laurel near California. Two-story and basement; owners, Jacob and Peter Schaefer; contractor, W. W. Rednall; signed, Dec. 18; filed, Dec. 18; cost \$4650.

Market near Fourth. Excavating and bulkheading; owner, Mrs. A. M. Parrott; architects, Pissis & Moore; contractor, A. E. Buckman; signed, Jan. 9; filed, Jan. 9; cost \$10,500.

Market bet. 2d and New Montgomery. Finished wood work except hard floors, alterations and additions Hoffman Cafe; owner, W. J. Sullivan; architects, Wood, Lovell & Claffin; contractor, R. Herring; signed, Dec. 30; filed, Jan. 11; cost \$3000.

Market bet. 2d and New Montgomery. Marble work, etc., Hoffman Cafe; owner, W. J. Sullivan; architects, Wood, Lovell & Claffin; contractors, Ruffino & Bianchi; signed, Jan. 5; filed, Jan. 11; cost \$1075.

Page street near Masonic Ave. To build; owner, S. N. Woods; architect, Edward Burns; contractors, Jas. & M. E. Rountree; signed, Jan. 6; filed, Jan. 10; cost \$8725.

Rail Road near Farragut Ave. To build; owner, Ada M. Plath; contractors, Bates & Deuel; signed, Jan. 5; filed, Jan. 9; cost \$1500.

Shotwell street. To build; owner, Henry C. Herbst; contractor, J. H. Pauls; signed, Dec. 11; filed, Dec. 14; cost \$2980.

Sutter and Mason. Plumbing, gas-fitting, sewerage and marble work to Bohemian Club; owner, S. Wenban; architects, Pissis & Moore; contractors, Sam. Ickelheimer & Bros.; signed, Jan. 4; filed, Jan. 5; cost \$15,000.

Twenty-Sixth and Folsom. Alteration and additions; owner, Henry Mohr; architect, Julius E. Kraft; contractors, Ackerson & Peterson; signed, Dec. 18; filed, Dec. 20; cost \$2240.

Twentieth near Noe. To build; owner, Frank Hayes; contractor, R. B. Hicks; signed, Jan. 8; filed, Jan. 11; cost \$2025.

Turk near Lott. To build; owner, Wm. Boyle; architects, Shea & Shea; contractor, James Cochran; signed, Dec. 16; filed, Dec. 19; cost \$1875.

Water Lot 645, 45, 10, Mission. Brickwork; owner, C. Flatman; architect, A. B. Farr; contractor, J. Wagner; signed, Jan. 8; filed, Jan. 9; cost \$2442.

Western Addition, block 326. To grade; owner, H. H. Buhne; contractor, Edward Owens; signed, Jan. 8; filed, Jan. 9; cost \$250.

The California Architect and Building News.

Copyrighted 1893, by the California Architectural Publishing Company.

OFFICE, 408 CALIFORNIA STREET,

SAN FRANCISCO, CAL., U. S. A.

VOLUME XV.

FEBRUARY 20th, 1894.

NUMBER 2.

A MONTHLY JOURNAL DEVOTED TO THE ARCHITECTURAL INTERESTS OF THE PACIFIC COAST.

Published on or about the 20th of each month by The California Architectural Publishing Company. The Stockholders being Architects and others interested in the profession.

SUBSCRIPTION TO THE JOURNAL, \$3.00 PER YEAR IN ADVANCE.

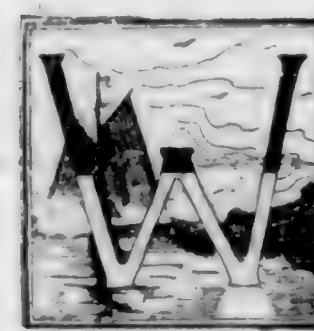
ESTABLISHED 1879. NOW IN THE FIFTEENTH YEAR. INCORPORATED 1889.

W. J. CUTHBERTSON, President.

OLIVER EVERETT, Secretary.

Remittances should be in the form of postal orders, payable to THE CALIFORNIA ARCHITECTURAL PUBLISHING COMPANY, and all communications addressed to the office of the Company, 408 California Street, San Francisco, Cal.

ADVERTISING RATES:				
Space.	1 Month.	3 Months.	6 Months.	12 Months.
1 inch.....	\$ 1 50	\$ 4 00	\$ 7 50	\$ 13 00
3 inch.....	4 00	10 00	18 00	35 00
6 inch.....	7 50	18 00	32 00	60 00
1 Column.....	12 50	35 00	65 00	125 00
1/2 Page.....	20 00	57 50	105 00	200 00
1 Page.....	40 00	110 00	200 00	350 00



H A T decision the Capitol Commissioners of the State of Washington will reach in regard to the designs recently submitted in competition for their capital building is a matter of great doubt. Prof. Ware who was called in as an expert reached his conclusions without any hesitancy. He recommended six designs out of the one hundred and eighty seven submitted from which he hoped the commissioners would make their final choice. From reports in the Washington papers it seems that the local architects and builders are inciting opposition to Mr. Ware's report.

It seems that the commissioners regard his decision as too hasty. It should be remembered that Mr. Ware was employed as an expert, and that very fact should be regarded as sufficient reason for his reaching a conclusion without delay.

Mr. Ware, as every architect knows, has acted as judge in every important competition held in this country in recent years. Having acted in this capacity oftener than any other member of his profession. He stands by common consent at the head of the architectural profession in America and the splendid success of the Chicago Exposition buildings proves that the United States leads the world.

If Prof. Ware in his keen judgment decided without hesitation that six certain designs were more meritorious than all the others submitted it can be safely assumed that he had sound reasons for his decision. Yet the Capitol Commissions only included two of the plans selected by Mr.

Ware among the five from which they intended to select the final one.

By "turning down" their expert's report they will not profit fully by his advice, which will of course be a matter for the profession to regret. It seems that the governor who is chairman of the Capitol Commission desires to run things his own way, for according to report, he summarily removed one of the commissioners from office who had had the temerity to decide against the executive. The vacancy thus caused will delay the decision of the commission and it is to be hoped that they will reconsider Mr. Ware's report and give his recommendations the full weight that they deserve.

It is charged that Mr. Ware overestimated the cost of a capitol building when he determined that fifty cents per cubic foot would be required to construct the one at Olympia. The local builders stated that thirty cents per foot would be sufficient.

This has been made an important issue between Mr. Ware and his opponents. From an artistic point of view it is immaterial. But from the practical side it can be easily shown that while thirty cents per cubic foot should be ample to construct any building, most state capitols and other public buildings have cost from fifty cents to one dollar per cubic foot. Indeed some noted examples exist that cost considerable above the last figure.

For the sake of architecture and as a matter of State pride the Washington Commissioners should at least recall Prof. Ware and give his conclusions a fair hearing.

CONCRETE CONSTRUCTION.

THE FOLLOWING PAPER WAS READ AT THE EVENING SESSION OF THE SAN FRANCISCO CHAPTER OF THE AMERICA INSTITUTE OF ARCHITECTS, FRIDAY, FEBRUARY 9TH, BY MR. GEO. W. PERCY.



On January 6th, 1888, the author read a paper before the Technical Society of the Pacific Coast on the general subject of "Practical Application of Concrete and Iron to Resist Transverse Strains," in which paper many of the early tests and experiments were recorded in detail, together with several examples of executed work. The interest by the writer in perfecting some economical method of fire-proof and permanent construction, has not diminished, and he is glad to report a fair measure of progress and success in the particular direction outlined in the paper referred to.

One of the most important problems that should find a solution in our day is of finding some method of erecting ordinary buildings with enduring materials and largely with cheap or unskilled labor, thus bringing the cost of buildings that shall resist the ravages of fire and other elements, within the means of the average house owner.

Owing to the abundance and general distribution of suitable materials for concrete, and the ease with which it may be prepared and put in place, the writer believes the desired solution may be found in that direction. The advantages of concrete for foundations and all masonry work under water or underground, are recognized by every one; also its adaptability for basement floors, side-walks and other positions where surface wear and compression are the principal forces to be resisted. For walls and partitions, floors and roofs of buildings, its adaptability has not been so apparent, or its application as successful as might be desired. On account of the small and very uncertain tensile strength of ordinary concrete, it has appeared to be entirely unadapted for horizontal beams or floors, or any parts of a structure subject to other than compressive force, nor did it appear a hopeful field for investigation and experiment. However, many efforts have been made during the past twenty years to unite the tensile strength of iron with the compressive strength of concrete in such a manner as to secure the full value of each material for its respective position. These experiments demonstrated many years ago the feasibility of the union, but the methods were more or less complicated, and wasteful of the more expensive material, iron, for which reason little use was made by the discovery until Mr. Ernest L. Ransome, of our city, invented and applied plain, square, cold, twisted iron bars for this work, and demonstrated clearly that this simple process was perfect in its results, even showing a much greater advantage than the original tensile strength of the iron.

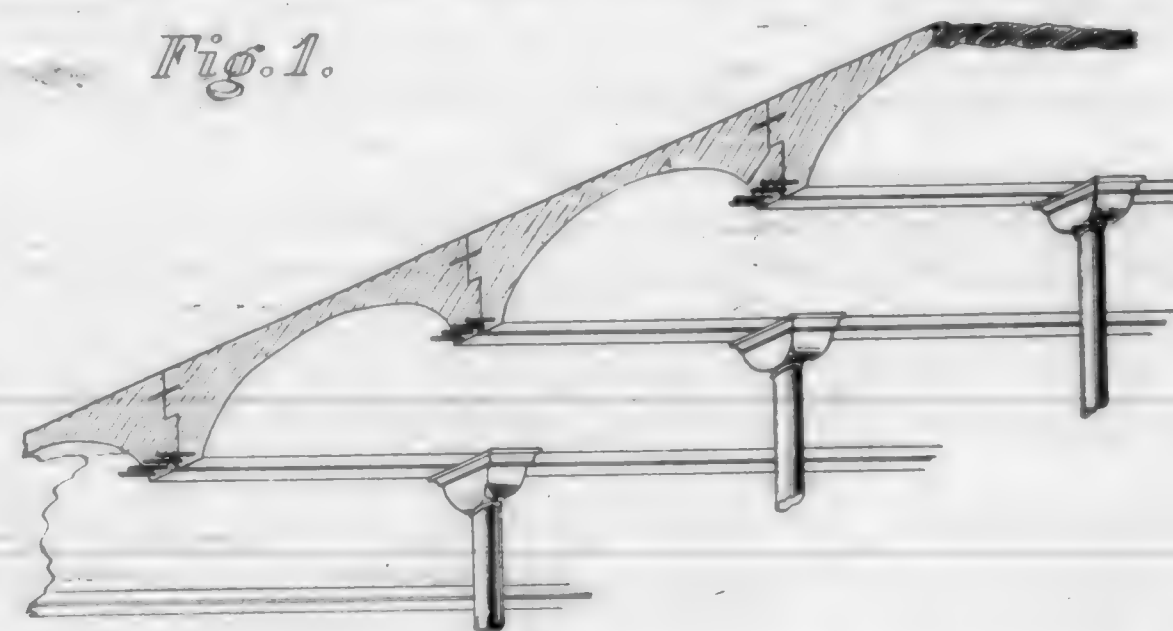
Hundreds of tests have been made by experts in various parts of this country, and in England and Scotland, with the uniform result that cold twisting of plain iron bars increases their tensile strength from ten to twenty-five per cent, and even as high as fifty per cent, increase was obtained in one case by Lieut. Gilmore, at the Union Iron Works in this city. This, together with the fact that the process of twisting will clearly reveal any hidden defects or weak places in the bars, makes the process a valuable one, while the simplicity and effectiveness of the combination of such bars with concrete, makes a long stride towards the solution of our problem, and greatly broadens the field of concrete construction. Mr.

Ransome proposes a further saving in iron by rolling the iron bars with largest section in middle of bar, and diminishing toward each end, thus proportioning the area of iron to the required strength. A similar saving can be obtained with the ordinary bars by placing shorter bars in the center of beams, in addition to those extending the entire length.

The present paper will contain notes of the principal work that has been executed in this vicinity and that has come under the writer's observation since the date of the paper referred to.

The first example in point of time is the Bourn & Wise wine cellar at St. Helena, erected in 1888. This building is 400 feet long, seventy-five feet wide and three stories high. The entire site is cut into the side of a gentle sloping hill and so arranged as to have driveways fifteen feet wide along the entire length at the rear, and at the levels of both first and second floors, while beyond the driveways and retaining walls are thirteen tunnels, sixteen feet wide, penetrating the hill about 200 feet. On the site of the building and immediately surrounding it, were an abundance of boulders, of very hard basaltic stone, quite unsuitable for rubble stone work, owing to their rounding form, but excellent material for concrete when crushed; the finer materials were obtained in the form of gravel from a neighboring creek. A good quarry of the soft but durable volcanic tuffa so common in Napa Valley, was found within half a mile of the building, and as it could be quarried, hauled and built into the walls for seventeen cents per cubic foot, it was employed for all walls and partitions of the building. The foundations, retaining walls, lining of tunnel entrances, and main floor laid on the ground, were formed of concrete in the usual manner. The entire second floor, together with the driveway at that level, was constructed with concrete and twisted iron rods in the form of beams and elliptical arches, as shown in figure 1, and as here described. Two rows of iron columns seven feet four inches on center, were placed lengthwise of the building, dividing the width into three sections of about twenty-five feet each. The floor was constructed with concrete beams seven feet four inches on centers, passing entirely across the building, with their soffits resting on the iron columns. The beams were twenty-four inches deep from soffit to surface of floor, and each had four $1\frac{1}{4} \times 1\frac{1}{4}$ " twisted iron rods near the bottom, with a verticle joint

Fig. 1.



along the center of each beam, protected against leaking by a strip of lead embedded in each half of the beam. The arches between the beams were elliptical in form, and the concrete five inches thick at crown of arches.

This floor was estimated and intended to carry with safety on each beam, for each twenty-five foot section, two casks each containing 2,000 gallons of wine, or a total weight, including cooperage, of 40,000 lbs., on each section $7'4 \times 25'$, or about 220 lbs. per square foot, uniformly distributed. The arrangement of the casks was intended to leave a gang-way eight feet wide in the center of each section, thus giving

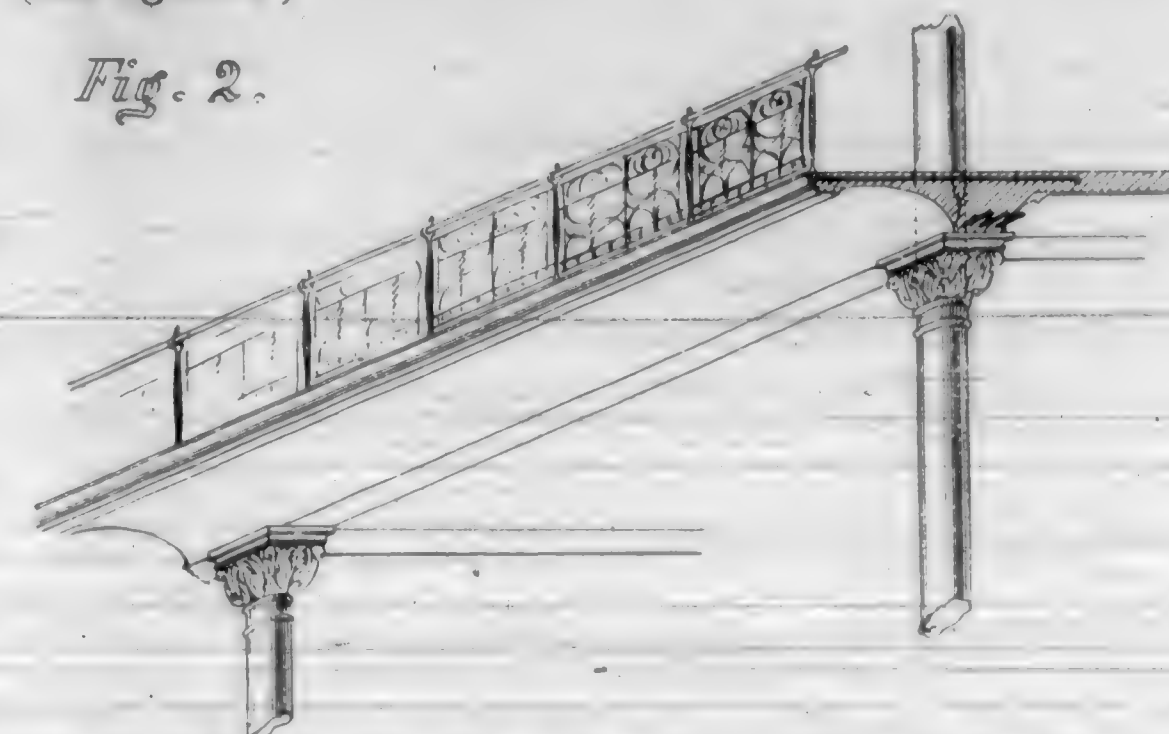
less stress than a uniformly distributed load. Before the building was finished, one of these sections was tested with a uniformly distributed load of 300 lbs. to a square foot, and produced a deflection of $\frac{1}{8}$ of an inch at the centre; on removing the load the beam returned to very nearly its original position. Since the building has been occupied, many of the gang-ways have had tiers of large casks placed two in height along the entire length, and smaller casks set between the upper bilges of the large casks, thus loading the floor largely in excess of its intended capacity. Implicit faith seems to be placed in this construction by those engaged about it, that it will carry anything that can be put on it. These floors have now been in use four or five years, and answer the purpose for which they were designed by making a strong and non-absorbing floor, and assisting in keeping a uniform temperature throughout the building.

The next building of importance in which the writer employed concrete and iron floors, was the California Academy of Sciences in this city. In this case a careful estimate of cost was made of the usual steel beam and hollow tile construction, and compared with the cost of this method. The result was a saving of fifty cents per square foot, or \$20,000, for the entire building in favor of the concrete and twisted iron method. After due investigation, the latter method was adopted by the Board of Directors, and executed by Mr. Ransome. This work was subject to much adverse criticism by certain architects and builders, and some members of the Academy of Sciences, and persistent efforts were made by some to have the work condemned by the fire wardens on the ground that it was not provided for in our valuable compilation known as the building ordinances. Several visits were made to inspect the work by parties connected with the Fire Department, but as they could not find anything about the construction that could be injured by fire, and having sense enough to perceive its great strength, they declined to take any action in the matter. To satisfy all skeptics in regard to the strength of this work, a test was made on a section of the second floor twenty-two feet span and fifteen feet wide; this was loaded with gravel uniformly to 415 lbs. to a square foot, and showed a deflection of only one-eighth of an inch at the centre of the beam. The load was left on this floor four weeks, and during that time many of the critics were invited to examine it. That very few availed themselves of the opportunity may indicate an unwillingness to have wrong opinions corrected. To those, however, who were directly interested in the work and had entertained honest doubts of its strength, this test was satisfactory and conclusive.

The floors in this building were constructed with large beams about fifteen feet apart and flat panels eight inches thick between, with the plastering applied directly to the concrete and cornices run on the splayed sides of the beams, while the colored cement floor was laid directly on the concrete and marked off into tiles. The tension rods in these floors are hooked into wall anchors at the wall ends, and into holes cast in the flanges of iron columns at the other ends, while all around the large light well the rods clamp the iron columns together. After these floors were put in it was considered advisable to extend the floors four feet beyond the line of columns, thus narrowing the light shaft with balconies four feet wide all around. This was readily accomplished by placing the forms and filling in the concrete, with $\frac{3}{4} \times \frac{3}{4}$ " twisted iron rods near the top, placed 1' 6" apart, and extending from two to four feet into the old concrete (by cutting grooves and grouting the rods) as it

is evident the tensile strain is at the top in this example. (See figure 2.)

Fig. 2.



The Leland Stanford, Jr., Museum at Palo Alto is probably the largest and most important building in the world constructed entirely of concrete. It was designed to have dressed San Jose sand stone for the external walls, backed up with brick, and to have brick partitions, with concrete floors. Owing to the great cost of stone work, it was decided to build the walls of cement concrete colored to match the sand stone used in the other university buildings, and to carry out the classic design first adopted. This led to making the entire structure, walls, partitions, floors, roof and dome, of concrete, making it in that respect a unique building.

Having some knowledge of the disadvantages and defects natural to a monolithic building, such as result from the shrinkage and the expansion and contraction of walls, floor and roof, several new experiments were tried to overcome them, with varying results of success and failure. It was thought to overcome the cracking of walls by inserting sheets of felting through the walls following the lines of the joints as near as practicable on each side of windows. The lapping bond of the concrete, however, proved too strong to allow the cracking to follow these joints; in most cases the weakest points were found at the openings, and small cracks appear from window head to sills above.

Joints were formed through the floors about fifteen feet apart and in most cases the cracking has followed these joints and confined to them. To prevent the possibility of moisture penetrating through the walls, and also to render them less resonant, hollow spaces five inches in diameter were moulded in the walls within two inches of the inside face, and with about two inches of concrete between them. These are successful for the primary object, and partially so for the secondary.

Fig. 3.

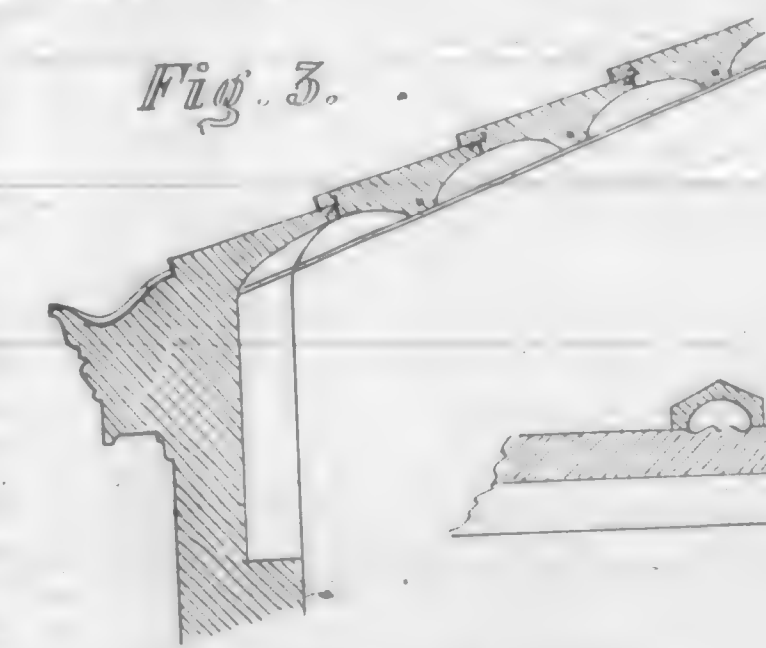
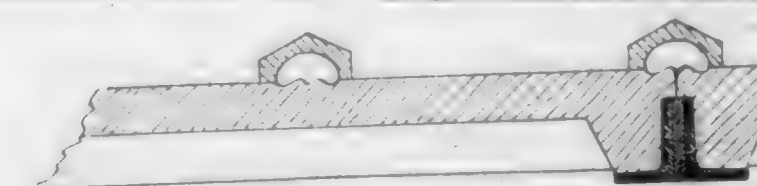


Fig. 4.



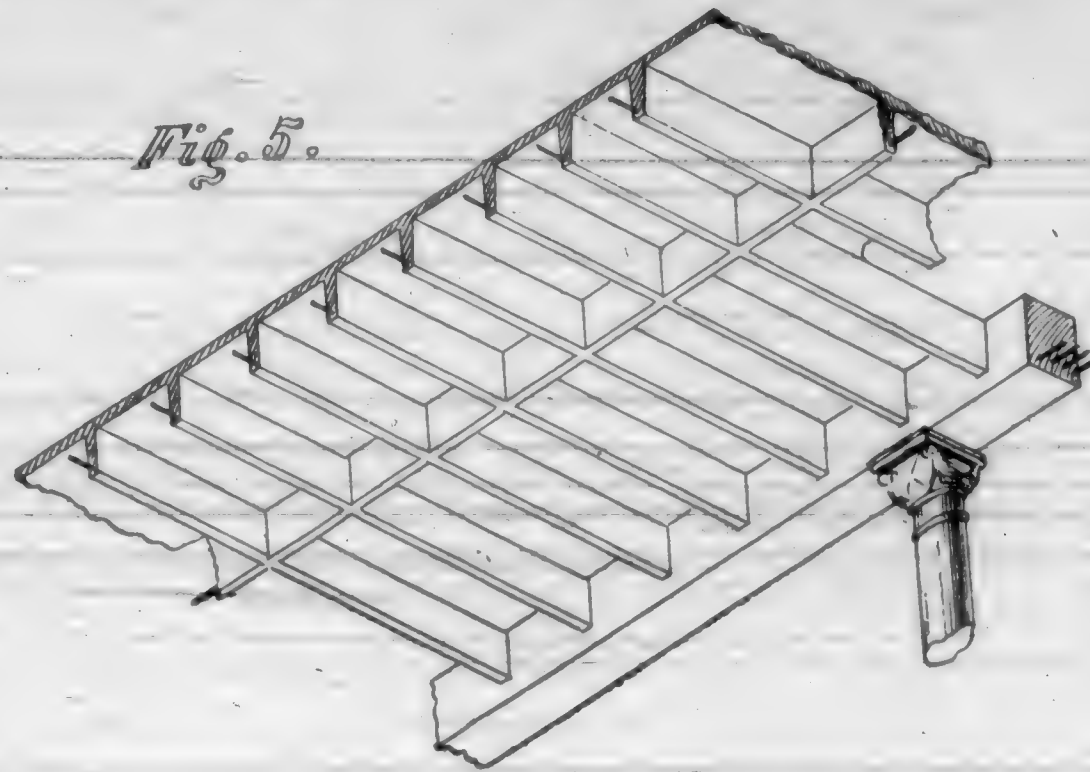
The roof being the greatest innovation, and the first attempt known to the writer of forming a finished and exposed roof entirely in concrete, required the greatest care and consideration. The result in form and appearance is shown by

figures 3 and 4, and is described as follows: The roof is supported on iron trusses ten feet on centre, and has a pitch of twenty degrees. The horizontal concrete beams rest on the iron rafters, and with the half arches form the horizontal lines of tiles about two feet six inches wide, with the joints lapping two inches and a strip of lead inserted as shown. Vertical joints are made through the concrete over each rafter with small channels on each side. These joints and channels are covered with the covering tiles shown on drawings, and similar rows of covering tiles are placed two feet six inches apart over the entire roof, thus forming a perfect representation of flat Grecian tile or marble roof. Notwithstanding the precautions taken, this roof presented several unexpected defects. The most serious proved to be in the Venetian red used for coloring matter and mixed with the cement. This material rendered the covering tiles absolutely worthless, many of them slacking like lumps of lime, and all were condemned and re-made. The same material injured the general surface of the roof, rendering it porous and necessitating painting. The roof over the central pavilion being hidden behind parapets, is made quite flat and covered with asphaltum and gravel over the concrete. This roof, with its low, flat dome, is without question the largest horizontal span in concrete to be found anywhere on earth, being 46'x56', the flat dome having all its ribs and rings of concrete, with the panels or coffers filled with one inch thick glass, and weighing about 80,000 lbs. This structure, covering 21,000 feet and containing over 1,100,000 cubic feet of space, and requiring about 260,000 cubic feet of concrete, was completed in seven months time from the commencement of the foundations, and at a cost of about eighteen cents per cubic foot of space. This the writer believes to be a very low figure for a thoroughly substantial and fire proof building with marble stairs and wainscoting, cast iron window frames and sashes, and other parts equally enduring, and would call attention to the fact that concrete walls with iron rods imbedded, when cracked are not in the bad condition of stone or brick walls without bond, but the iron ties are always good to prevent spreading or falling, while several methods may be devised for allowing free expansion and contraction without producing unsightly cracks. Some such method should be employed on all finished structures.

One of the rooms in this building was designed to be the receptacle of many valuables, and to render it burglar-proof the floor, walls and ceiling had copper wires embedded in the concrete not over three inches apart, forming a continuous circuit, and designed to strike an alarm bell at the university if any wire should be cut. This device has been in use at the United States Sub-Treasury vaults in this city for several years, and would be very effectual for prison walls and cells, as it would be almost impossible to cut a hole through strong concrete large enough to admit a man's body, without cutting or breaking one or more of the wires, thereby giving an alarm.

Other important works have been executed in concrete in this vicinity, among which may be mentioned the Girls' Dormitory at the Stanford University, a three-story building, completed in ninety days from the time the plans were ordered. Also the Torpedo station on Goat Island, 80'x250', with walls about thirty inches high, built under the direction of Col. Mendill; and the addition to the Borax Works at Alameda. In the latter the walls, interior columns and all floors are of concrete, and are remarkable for the lightness of the construction and great strength. These floors are constructed as shown in figure 5. In these floors the clear

span is twenty feet. The floor consists of beams four inches wide at bottom, five and one-half inches at top and one foot six inches deep from bottom of beam to top of finished floor.



The beams are placed two feet six inches on center and the floor over the beams is only three inches thick. A section of this floor 10'x20' was tested February 28th, 1893, with the following results: Before testing there was a uniform load of 195 lbs. to a square foot, when the scale was set to indicate deflection.

With 234 lbs. per sq. ft., deflection	1-16 inch.
" 273 " " " " "	1-8 "
" 312 " " " " "	1-8 "
" 390 " " " " "	3-16 "
" 468 " " " " "	3-16 "
" 551 " " " " "	1-4 "

This deflection is in addition to any that may have existed with the initial load. In November, 1893, the writer visited the building with Mr. H. G. Jacobs, Government Inspector of Buildings, and in our presence a test was made on a section of the third floor, that was selected as an apparently weak spot owing to several cracks showing on the ceiling. A sliding rod was adjusted under the center of the beam. There was a distributed load of about 200 lbs. per foot at the commencement; 225 lbs. per foot additional were applied, and the deflection noted was less than 1-16 of an inch. This type of floor appears to be the best form yet devised for obtaining great strength with the minimum weight of concrete and least expense of carpenter work, the forms used being standard size to be used over again. With the present price of materials and labor, such floors can be built with twenty feet span of safe strength for 250 lbs. per square foot, and with finished cement surface, for forty-five cents per square foot, and without the finished floor surface for forty cents per foot. Level plastered ceilings may readily be suspended from the beams and wood or tile floors laid over it, as in other methods of fire-proof construction. This method of forming floors with the minimum of very rich concrete, is lighter than the common method of steel beams and hollow tiles, for the same strength. The concrete should be composed of one part of Portland cement to three parts of selected aggregates.

The results given above are much better than could have been expected or hoped for a few years ago, and it is quite possible we have not yet reached the highest development. Portland cement may be brought to a higher grade of strength, and intelligent handling may produce better results with what we have. Several tests recently made with various brands of Portland cement, to ascertain what effect on the strength of concrete would be produced by a delay between the time of mixing and tamping in place, have given surprising results which the writer believes have never

been made public. These tests, as far as carried, show that the initial setting of the cement, (when mixed with sand or gravel,) is not the strongest that may be obtained, and that while a delay of one hour or less may be injurious, a delay of one to three hours may be beneficial. Thus in a test made with Knight, Bevan & Sturgess' cement, one of cement to two of sand, the result obtained was as follows:

Delay in hours:	0, 1, 2, 2½, 3½, 4½.
Test in lbs.:	252, 228, 240, 256, 306, 228.

In this case the delay up to two hours was detrimental, while a delay of 2½ to 3½ hours gave higher results. Similar tests with White's cement gave the best results with a delay of 1½ hours, after which the strength fell rapidly. The writer would suggest that this line of investigation could be profitably followed up, with many tests made with different cements and different mixtures, and the results tabulated, thus adding to our knowledge of cement and showing the way of obtaining the best possible results.

In conclusion the writer would say, that while he does not think that concrete in any form is likely to take the place of stone, brick and terra cotta for architectural work, he feels quite certain that in combination with iron it is destined to fill a large place in the construction of buildings, and for warehouses, factories, wine cellars, etc., it is now the best and cheapest material for producing substantial and incombustible work.

AIR AND WATER PURIFIER.

WE give below a description of an invention recently patented by Dr. Cornelius F. Buckley of San Francisco, which consists of a tank so made as to allow of only pure air having access to its contents.

The principal of this tank is a development of experiments made by the late Prof. Tyndall some twenty-five years ago, when the question of spontaneous generation was hotly debated by scientists. Tyndall arranged a series of tubes filled with distilled water, exposing some to ordinary atmospheric air—and covering others with layers of cotton wool of different degrees of thickness. It was demonstrated beyond a question that the tubes openly exposed to the atmosphere teemed with living organisms in a space of twelve hours, and that similar organisms developed in the protected tubes in the inverse ratio to their protection. All recent experiments corroborate these statements and go to show that diseases of all kinds are largely obtained through the atmosphere poisoning our drinking water.

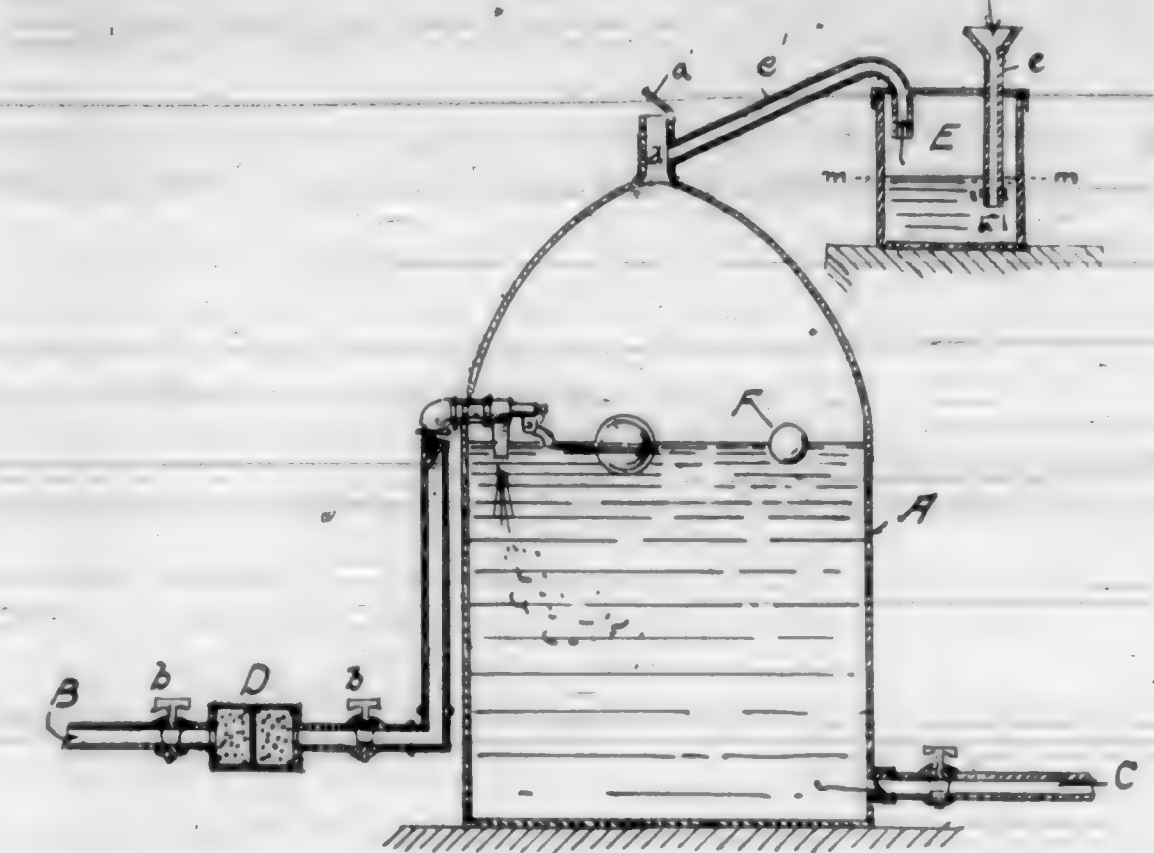
Hence, the most important, indeed the vital feature of this tank is first the complete disinfection of the air that reaches the water, second, that disinfected air in turn disinfects the water itself.

Referring to the accompanying drawing which is a vertical section of the apparatus.

A is a closed tank or reservoir of suitable construction and capacity. It is provided with the inlet pipe B, from the water main, and with the cock-controlled outlet pipe C, for service. Its top is provided with the air exhaust passage a having at its outer end a check valve a'. If filtered water is to be used, there is fitted in inlet pipe B a filter D of any suitable construction and containing any desired filtering media. A cock b may be placed in pipe B, in advance of the filter, and another b' behind it, thereby the passage of water may be controlled, and the contents of the reservoir

confined, when for any purpose, as for cleansing, the filter may have to be temporarily removed.

E is a closed air-disinfecting case or bottle. It has an air inlet pipe or funnel e, and an air outlet pipe e', the latter communicating with the top of the reservoir A, or as here

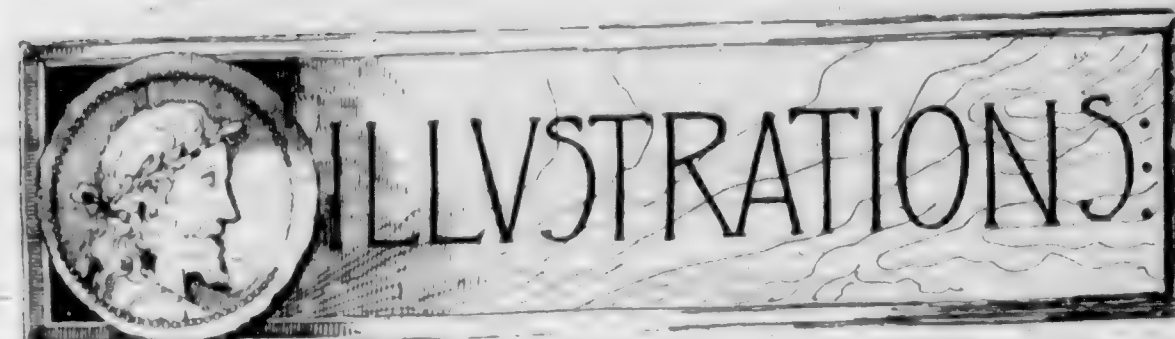


shown with the air exhaust passage a. This air disinfectant may be of any suitable construction or arrangement, and its contents may be of any proper character. It is proposed to use in it a solution of chloride of iron, the level of which will be maintained, as shown by the line m-m, above the lower end of inlet funnel e and below the lower end of outlet pipe e'.

Within reservoir A is a valve for automatically closing the top of the reservoir to prevent the overflow of water therefrom. In the present case this valve is shown as a float ball F, which will rise with the water and will seat itself in the inner end of exhaust passage a, thereby preventing the outflow of water through said passage, and also preventing it from overflowing through pipe e' into the air disinfectant case or bottle E.

The operation of the apparatus is as follows: Water, from the main, passing through pipe B, enters the reservoir A. When the filter D is used, it enters as filtered water. As it fills said reservoir, the air is expelled through the passage a and check valve a', and when the reservoir is full the float valve F confines the water. Now, when the water is drawn upon by the opening of service pipe C, the check valve a' will close and cut off all direct communication with the outer air, but air will pass down funnel e, through the disinfecting medium in bottle or case E, and thence as disinfected air will pass through pipe e', into the reservoir A, to occupy the space left vacant by the lowering water therein. Thus, only disinfected air will be admitted and come in contact with the contents of the reservoir which will serve not only to avoid contamination but also to aerate the water and to permit its ready outflow for use.

The January number of the CALIFORNIA ARCHITECT AND BUILDING NEWS is particularly handsome. It is devoted to the Midwinter Exposition buildings, illustrated by five full-page, half-tone pictures and a sixth, of equal size, of the Santa Barbara Amphibia. The illustrations are very handsome and the detail is excellent. They have evidently been made from photographs taken on the ground. The letterpress is beautifully clear and clean and the new cover is a dainty design. Among the contributed articles is one on the strength of the dome of the Horticultural and Agricultural building by Civil Engineer D. E. Condon.—San Francisco Chronicle.



The management of this journal desires to extend a cordial invitation to all architects on this coast and elsewhere to contribute designs for publication.

Drawings should be made with perfectly black lines on a smooth white surface. Good tracings, if made with black ink, answer the purpose.

The designs selected will be published without charge. All drawings, whether accepted or not, will be returned to their authors, who must bear express charges both ways.

THE suggestive sketch for an entrance to the Midwinter Fair is by C. T. Taylor, Jr.

A study for a Sutter street front is by Polk & Polk, architects of this city.

RESIDENCES for J. S. Butler, Esq., is by architects, Martens & Coffee.

A Cottage for R. George Zahn, Esq., is by architect, J. Cather Newsom.

THE Columbarium now being built at Cypress Lawn Cemetery, from the plans of architect, Mr. Thomas P. Ross, is nearing completion. Although the interior finish has not been decided on as yet, it is intended to be in marble boxes or niches, with bronze open grille door, two galleries being necessary for height of building. The exterior walls consist of rock faced granite laid in broken ashlar. The dome will be covered with terra cotta tile and with skylight on deck in figured glass. The doors to be of heavy wrought iron with plate glass panels. The building is to be fire-proof in every respect.



COLUMBARIUM, CYPRESS LAWN CEMETERY.
SAN MATEO CAL. THOMAS P. ROSS, ARCHITECT.

"DUST TO DUST AND ASHES TO ASHES."

THE Crematory at Cypress Lawn Cemetery, built from the plans of Messrs. Pissis & Moore, which plans were published in the June issue of the CALIFORNIA ARCHITECT AND BUILDING NEWS, is now in active and successful operation.

The following article from the San Francisco Examiner, give an impressive idea of the ceremonies attending this disposal of the dead:

"Along the grass-bordered paths of Cypress Lawn Cemetery four silent men carry a burial casket. They bear it gently and their tread is slow and solemn. But they seek no grave where earth has been freshly turned and they lay their burden down when they enter a building of gray granite.

"The four men are strangely clad. Each wears a blouse of black silk and a skull cap of the same material. Nowhere is there a gleam of color. When they had placed their burdens on a dais, still treading softly, as silently as they came, they withdraw. For a time their work is done.

"The gray granite structure stands on the side of a gently sloping hill that at the crest is dark with the waving leaves of eucalyptus. The building is plain and massive in general effect, with considerable elaboration of detail. The style of architecture would be difficult to define, but to the interior decorations there has been given a distinctly Greek character. The structure is almost square, though broken in the upper lines, and with the roof terminating in a dome of glass. But for the tall chimney at the rear it might be taken for a mortuary chapel and nothing more. A double flight of stairs, all of granite, leads to the part that is really the chapel. This, a bright, cheerful apartment, the walls finished in light brown relieved by typical shades of the same. The floor is tiled. The lofty ceiling curves until it merges into the glass dome, through which pours a subdued flood of light. At the rear is an arched alcove, and at the head of the center aisle, which ends as it reaches the alcove, is a raised platform, an altar it might be. It is on this dais that the black-clad men lay the casket containing the body about to be incinerated, yet there is no suggestion here of heat or ashes. The members of the funeral party take seats on either side. Flowers have been piled about the casket. Then the minister speaks the words of comfort.

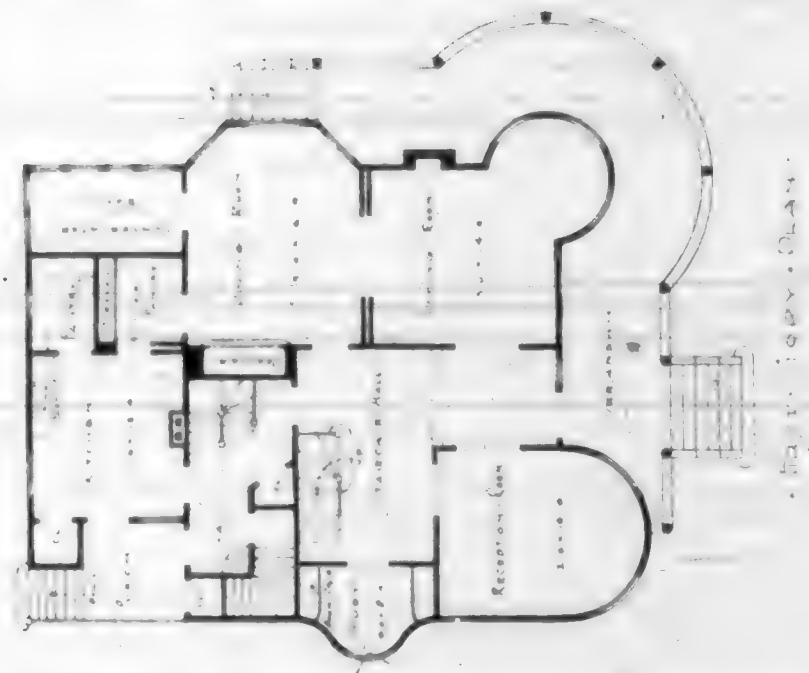
"When the prayers have been said and with hands outstretched above the dais the minister has pronounced the benediction, there is a change. A pall in the form of two extended wings springs from beside the platform and meeting above it, droops and hides the casket from sight. The spreading of the pall makes no sound, and when it has shut the casket from view, the dais and all upon it sinks from sight.

"In a few seconds the pall is removed as strangely as it came, the dais is again in place, but tenantless. In the bright chapel touched by the sun there is no longer sign of death. The mourners pass out. There is nothing more for them to do.

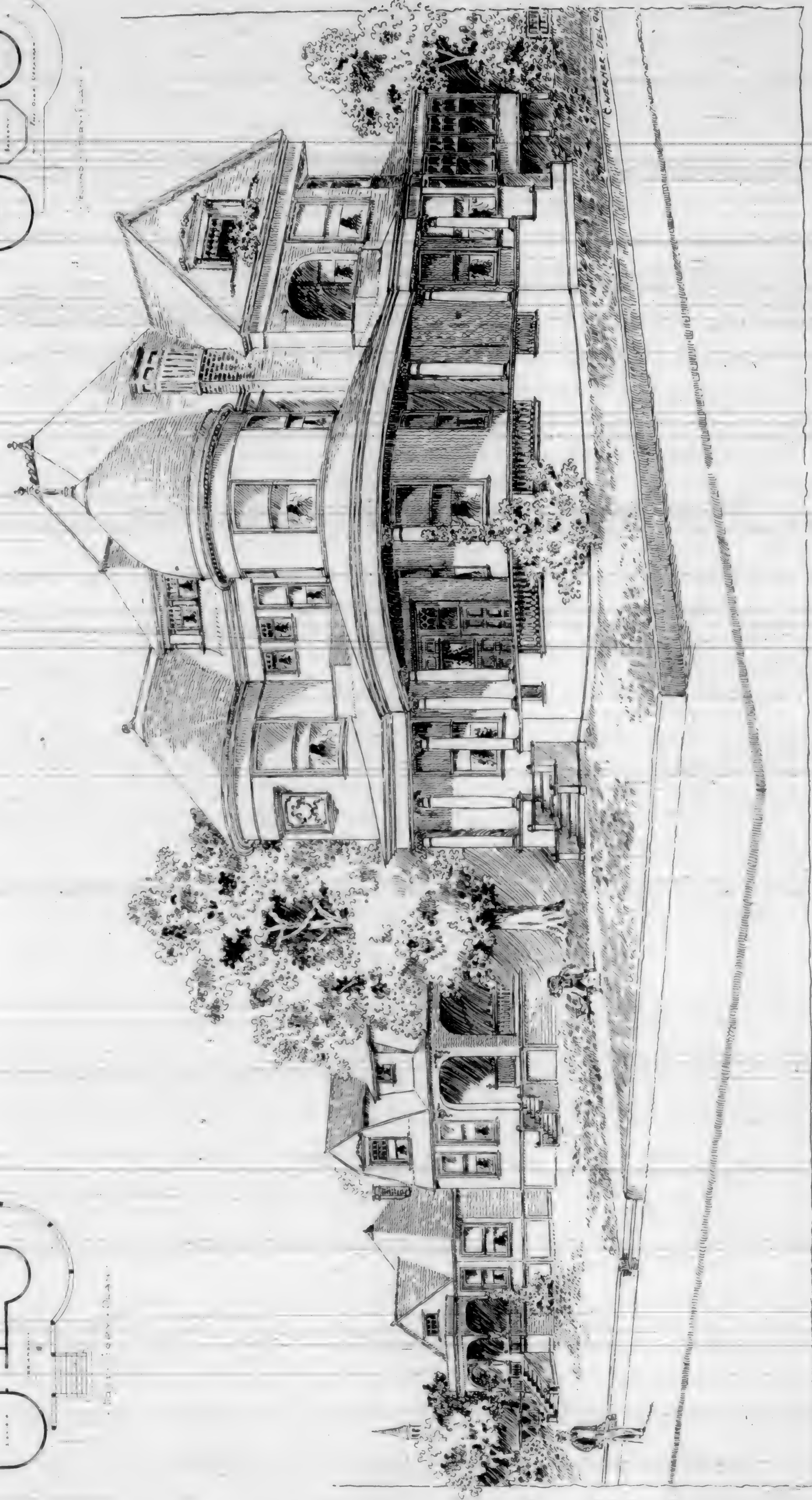
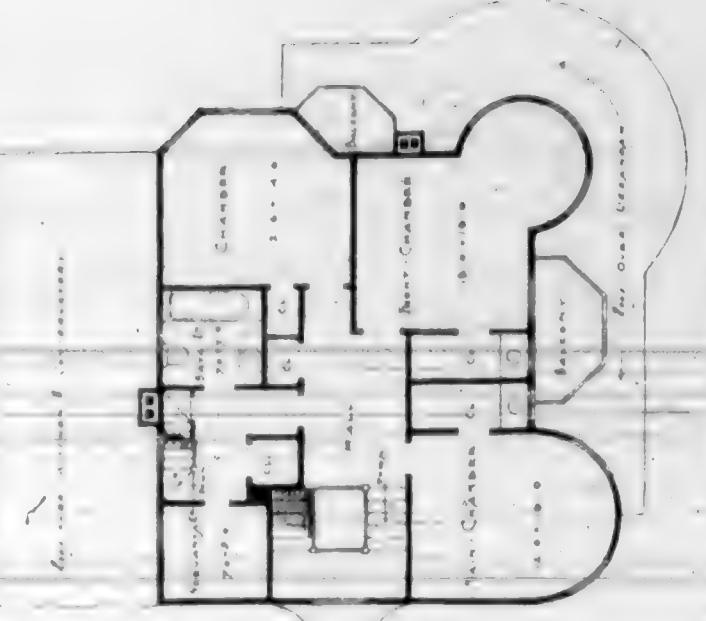
"The men in black are waiting in the furnace room below. When the casket comes down on the elevator the body is quickly removed, and, clad still in whatever raiment may have shrouded it, completely enveloped in an alum-soaked cloth. Then it is placed on an iron cradle that moves on wheels along an iron track. The furnace door is opened so deftly that one marvels how, and so without a jar that it does not seem that steel can be rubbing against steel. In an instant the cradle is pushed forward.

"For a second one may look into the depths aglow with heat, and from the back see flames leaping forward. The track is movable, for no metal could long withstand the temperature of the furnace. The track glides into the rosy interior and the cradle follows. Both are immediately withdrawn, the cradle comes back empty, the furnace door is closed once more and the dead left to turn speedily back to original elements. From the time the rigid form in white was deposited in the cradle to the time when the cradle left it in the retort eight seconds have scarcely elapsed.

"Then for once there is noise, the clamor of blows. The



RESIDENCES: PAUL DUTLER, Esq.
HARTNESS & CUFFY, ARCHTS.

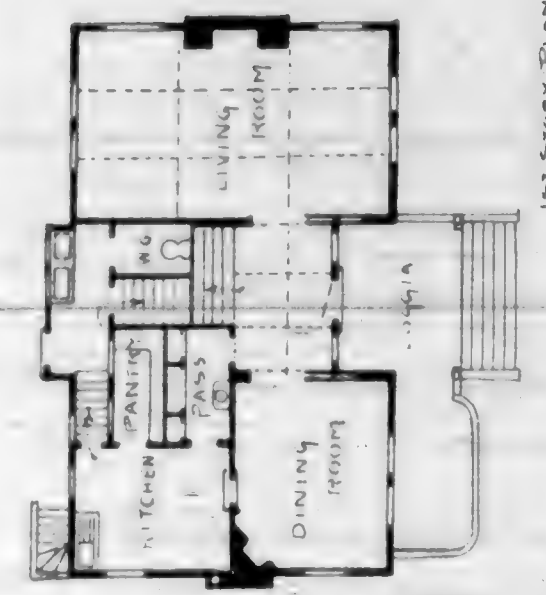


CALIFORNIA ARCHITECT & BUILDING NEWS
SAN FRANCISCO.

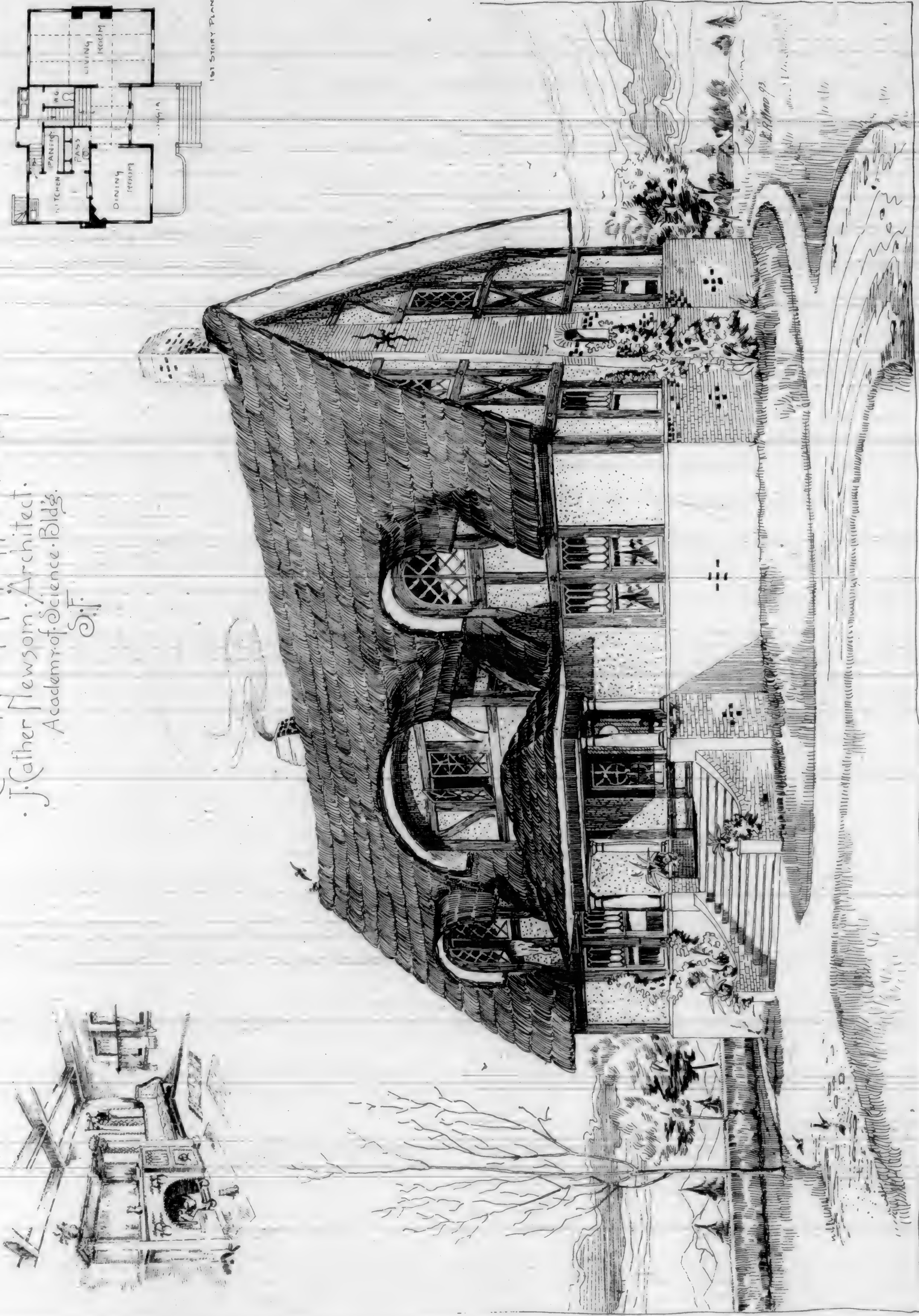
BRITTON & REY PHOTO LITH.

VOL. XV No 2. FEBRUARY 1894.

COTTAGE FOR R. GEORGE ZAHN, JR.
 J. Carter Newson, Architect.
 Academi of Science Bldg.
 S.F.



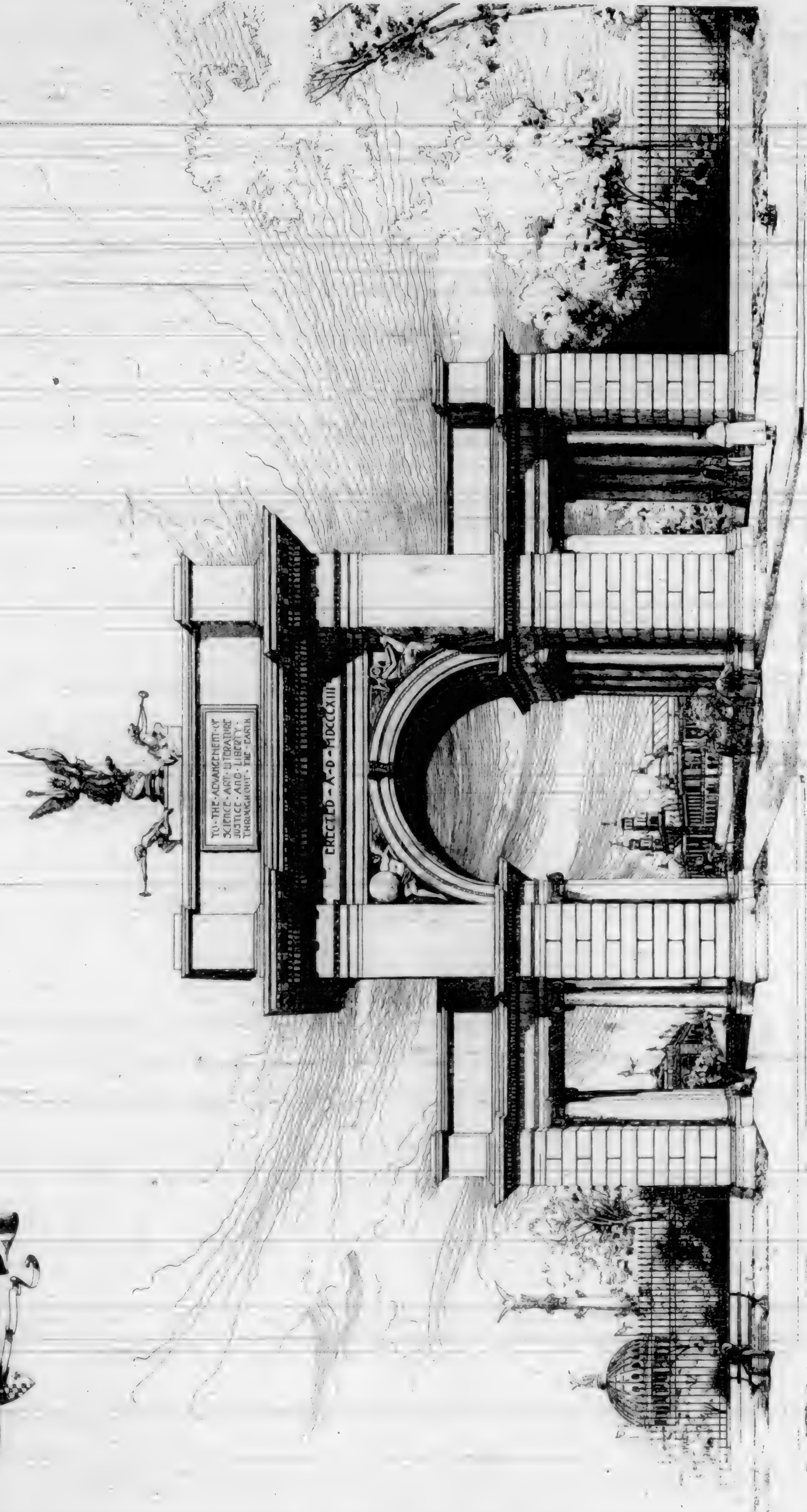
1st STORY PLAN



CALIFORNIA ARCHITECT & BUILDING NEWS
SAN FRANCISCO.

BRITTON & REY PHOTO LITH.

VOL. XV NO. 2. FEBRUARY 1894.



CALIFORNIA ARCHITECT & BUILDING NEWS
SAN FRANCISCO.

BRITTON & REY PHOTO LITH.

VOL. XV NO. 2 FEBRUARY 1894.



STUDY FOR A SUTTER STREET FRONT POLK & POLK ARCHITECTS SAN FRANCISCO

costly casket is being knocked to pieces, the silver handles smashed and dented. Such is the fate of every casket that reaches the crematory. None so expensive that it is not used for kindling wood. Blow follows blow. The cloth is torn aside and the cedar underneath it shivers to splinters. The satin lining is rudely ripped away. It will be piled upon the flames. In a few moments the handsome case that loving friends had chosen is a heap of waste.

"But does not this seem like a wanton misuse of money?" The question was asked of the Superintendent.

"It does at first," he replied, "but there is no other way. Unless we did this there would be an illicit traffic in second-hand coffins. Unless we destroyed the handles they would be slyly sold. This has been done elsewhere, and we think it well to profit by the experience of others."

"And, then, why should it appear more wasteful than placing the same material in the ground? It is a matter of sentiment. The family feel like dedicating a certain amount to the one who has passed away. It really makes no difference whether this is placed in the fire or in the earth. One method cannot in this respect be termed more wasteful than the other."

"But half an hour has gone by. A peep through an aperture in the furnace door, ordinarily covered by a slide, reveals nothing repellent. Lying in the chamber where the heat is 1,500 degrees the body still seems to retain its shape, because the alum-soaked winding-sheet does not disintegrate until almost the last. When it does collapse there is no longer anything within. Meanwhile ashes white as snow have been sifting through the bars into an apartment beneath. One hour and there is little left in the retort. An hour and a half, and a trace remains. Two hours; the retort glows empty. In the apartment below the shower of ashes has ceased, and the deposit is taken out without any lessening of the heat above. The retort is ready to be used again."

"The ashes are placed in a copper receptacle as unpretentious as a milk can, sealed, labeled and put on shelf in a room devoted to the purpose."

"There is a process of cremation unlike the one described, but it is an exception to the rule. Sometimes circumstances suggest that a body that has been perhaps in the receiving vault be not taken from the casket. In such instances the metal is stripped away and casket and occupant go into the retort together. Incineration takes longer and the residue of ashes is somewhat greater. When a casket is in the retort one may, by listening at the door, hear the crackling of fire, but ordinarily not the faintest sound comes from beyond the barrier, and the leaping flames never touch the body that their heat all but obliterates."

"The furnace-room is not designed to be attractive, but it does not appall nor repel. There is little about it to betray its use. The floor is cement, and so are the walls and vaulted ceiling. The furnace itself is of white birch lined with a clay imported from Germany, the most suitable substance known under a lasting ordeal of fire. The room is entered through heavy oaken doors."

"There is in the building one room devoid of carpet and furniture, devoid of anything but plain shelves sustaining row upon row of the copper receptacles that possess more interest than all. Some of the receptacles are empty; quite a number are filled. The later are sealed and each marked with a date and a name. All the filled receptacles are light, but some twice as heavy as others. The heaviest probably weigh five pounds, and judged by the eye, contain three quarts of ashes. The ashes, of course, are at the disposal of friends. Some are to be interred. Some in deference to requests made by the dying will be scattered to wind and wave. As a rule they will remain where they are until they can be placed in the more pretentious Columbarium for which plans have been prepared and that will one day be as notable an addition to Cypress Lawn as the crematory itself has been. Thus far the regulation copper receptacles have been used, but there is always the privilege of adopting a funeral urn more elaborate."

"It is not without awe that one looks upon the ashes of what has been a human form. The black-coated attendants handle them with all respect. One of the men goes down

below the retort by a ladder and draws the ashes out. They are placed, still warm, in the receptacle. The largest particle is not larger than a silver twenty-five cent piece, and there are few this size. For the most part the mass is as impalpable as flour. The work of years been done in a few moments with no longer period intervening."

"All that has happened since the mysterious pall spread itself above the dais has been noted only by those having official right. Idle spectators are not allowed. Generally the mourners prefer not to linger after the solemn farewells in the chapels. The maintenance of privacy extends even to the names of those who have passed into the retort, these being usually held sacred and not regarded as matter of general interest. It will, however, at least remotely concern the public to know that one of the early subjects was Mrs. Griffes, for whose murder a man has just been on trial. Her ashes fill one of the largest receptacles."

"The process of cremation is so new in San Francisco that for a long time the picturesque building of gray will be an object of interest. Many visit it daily, at least to look up at the tall chimney and wonder that they see no smoke. Coke is the only fuel, and the vapor created by the destruction of fleshly tissues is utterly consumed. The crematory began operations without ostentation, and this policy has marked its conduct to the present. The managers were conscious that there was something of prejudice against the system, and feared lest this be strengthened by any chance mishap. There has been nothing of this sort."

"When the fire was started thirty bodies were in the receiving vaults, and these have been incinerated. Besides, there have been a number coming directly from the place of death, and still more are expected from a distance, one from far Mexico."

"The great surprise to the visitor is the absence of details such as might jar on the nerves. The attendants, trained and uniformed for their work, allow nothing to go amiss. When the casket sinks from the sunlit chapel it has been seen for the last time by those who watch it with tearful eyes. Their own word for it: it does not seem to them so terrible as if they saw it sinking into the grave and listened for the falling of the clods."

THE PRESERVATION OF THE WORLD'S FAIR BUILDINGS.

IT is gratifying to see with what unanimity the public is now clamoring for the preservation of the World's Fair buildings, which have certainly made an artistic impression on the country such as has never been felt before. Until within a few days, no proposition which seemed practicable has been made for keeping them, but a company has been formed which proposes to take in hand the buildings around the Court of Honor, replace the perishable staff with Portland cement on iron lath, keeping all the forms of the original, and paint the new material white. This will insure the preservation of the superstructure for many years, and it is proposed to strengthen the foundations, so as to prevent settlement and distortion. The company offers to do all this work, and to keep the buildings, grounds and waterways in order, for twenty years, in return for a concession for that period, entitling it to fence in the group of buildings, and charge a small admission fee. Independent of the question whether the company would find the enterprise profitable, there is no doubt that the city of Chicago would be benefited by the perpetuation of an attraction which may claim to have brought millions of strangers already to the city, and every artist would rejoice to see a little longer life accorded to the most renowned work that American architecture has yet produced.—*American Architect*.

The January number of the CALIFORNIA ARCHITECT AND BUILDING NEWS (monthly) is likened unto the last Sunday issue of the *Examiner*—a production which does credit to the energy and go-aheadativeness of its management. The illustrations therein of the Midwinter Fair are finely executed, and original.—*Warner's Building Review*.

NOTICE OF MEETINGS.

SAN FRANCISCO CHAPTER, AMERICAN INSTITUTE OF ARCHITECTS, meets second Friday of each month at 408 California street.
 SETH HANSON, Pres. GEO. W. PERCY, Vice-Pres.
 OLIVER EVERETT, Sec. JOHN M. CURTIS, Treas.

TECHNICAL SOCIETY OF THE PACIFIC COAST, meets first Friday of each month at Academy of Sciences Building.
 C. E. GRUNSKY, Pres. CHARLES D. MARX, Vice-Pres.
 OTTO VON GELDERN, Sec. GEO. F. SCHILD, Treas.

CALIFORNIA ELECTRICAL SOCIETY, meets the first and third Monday evenings of each month at the Academy of Sciences Building.
 GEO. P. LOW, Pres. C. O. POOLE, Vice-Pres.
 MAX CASPARI, Sec. H. T. BESTOR, Treas.

SAN FRANCISCO CHAPTER OF THE AMERICAN INSTITUTE OF ARCHITECTS.

THE regular monthly meeting of the Chapter of the American Institute of Architects was held on February 9th, 1894.

An application for membership was received from Mr. Edgar Marx Lazarus of 664-665 Worcester Block, Portland, Oregon, of the firm of Elliott & Lazarus. The application was presented by Mr. Reid and endorsed by Mr. Percy, and was referred to the Executive Committee to take the usual course.

The following communication was received from Mr. Percy:

GENTLEMEN:—Having experienced a great deal of trouble with Electrical Contractors, and being satisfied that some method should be adopted, whereby work of this kind could be properly installed, without the trouble and inconvenience usually had, I would respectfully suggest, that this Chapter consider the appointing of a permanent Electrical Inspector, his remuneration to be a certain per cent of the cost of the electric work in each installation, said amount to be paid by the Electrical Contractor, and to be added by him to his contract price.

In support of the above suggestion, I would state that such an appointment will at once relieve architects of the responsibility of designing electric installations, of drafting plans and specifications therefore, and of the supervision thereof. It will positively prevent imposition from the placing of inferior or unreliable electric work and in effecting the solution of the electric wiring problem, will be of the greatest service to both property owners and architects.

I would also suggest that in all Electric Specifications furnished by the architect, the contract should cease at the wiring of the gas outlets, and not include the electric burners, for the reason, that very often, owners do not place fixtures in the building for months after same is finished, thereby keeping the contractor out of his money through no fault of his own.

I also think that where possible, the electric work should be a separate contract, but all carpenter work in connection with same, such as closets, doors, wainscoting, etc., should be included in the carpenter's contract.

I respectfully ask the Chapter to discuss these matters and appoint a committee to consult with the different Electrical Contractors to see what can be done toward carrying out these ideas.
 G. W. PERCY.

Mr. Percy was appointed a committee to confer with the Underwriters and the Electric Light Co., and endeavor to carry out some such arrangement as suggested.

A communication was received from a committee of the Institute, requesting the views of the Chapter on the relationship of the Chapters to the Institute and to suggest such changes as may be deemed expedient.

A committee consisting of Messrs. Polk, Reid and Pissis, was appointed to act with the President and Secretary.

A letter was read from A. J. Bloor, the Secretary of the New York Chapter, in relation to the history of all the trans-



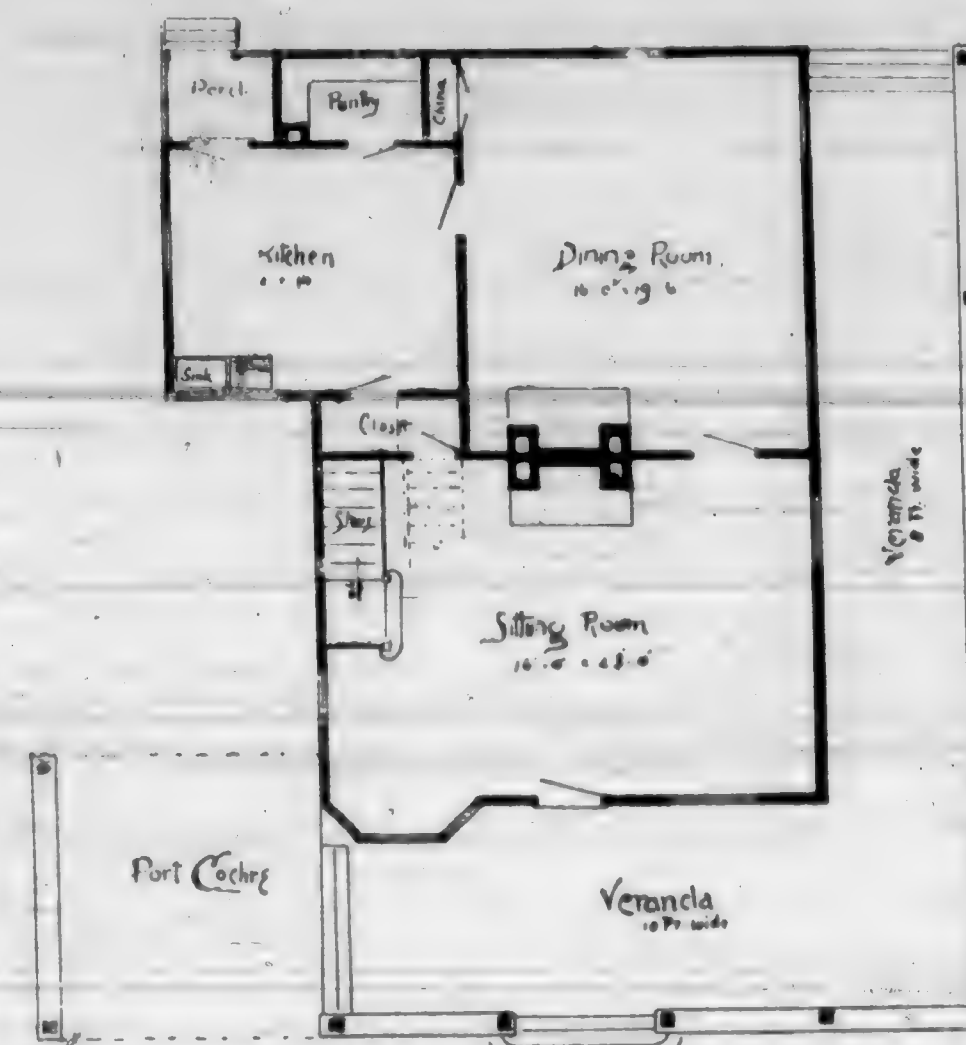
A COUNTRY COTTAGE.

actions of the American Institute of Architects, and kindred organizations, and the Secretary was instructed to assure Mr. Bloor of the hearty co-operation of the Chapter, and to offer such assistance to him as it may be in the power of the Chapter to give.

The St. Louis Chapter forwarded a copy of their Constitution and By-Laws, for which due acknowledgments were expressed.

At the evening session, Mr. Geo. W. Percy read an interesting and instructive paper on his experiences in the use of concrete in building construction, and in the discussion that took place after the reading, many points were more fully entered into.

THE CALIFORNIA ARCHITECT AND BUILDING NEWS, San Francisco, Cal., is making strides of progress that speaks of much energy and ability. The selection of illustrations are admirable for their useful studies and assistance offered to the profession of designing and planning, from a modest country cottage to palatial structures.—*The Chicago Clay Journal*.



LEGAL DECISIONS.

From a large number of Legal Decisions of the higher Court, of the different States of the Union, we select and publish in this column, such as appear applicable to this section of the country.

HOMESTEAD EXEMPT FROM MECHANIC'S LIEN.—A parol agreement to pay for materials used in the repair of a house on homestead premises is insufficient to charge the homestead with a lien for such materials.

Burtch v. McGibbon, Supreme Court of Mich. 56 N. W. Rep. 1110. 34.

LIABILITY OF ACCEPTOR OF ORDERS.—The acceptance of an order payable out of the last payment to become due on a building contract is enforceable against the acceptor, though the last payment never became due, where it was prevented from becoming due by the fault of the acceptor.

Mersereau v. Villari, Supreme Court of N. Y. 26 N. Y. Supp. 135. 47.

FORFEITURE OF WAGES IN CONTRACT OF EMPLOYMENT.—A contract of employment which stipulates that the employee, if he leaves the service without giving three days notice, shall forfeit all moneys owing him, provides for a penalty, and not for liquidated damages. Schmieder v. Kingsley, Common Pleas of N. Y. City and County, 26 N. Y. Supp. 31. 38.

EVIDENCE OF THE VALUE OF SERVICES OF ARCHITECT.—In an action for services as an architect, in drawing plans, the issue being as to the amount to be paid, according to agreement, the introduction of other plans in evidence was, at most, harmless error, testimony of a witness that he had obtained good plans of an architect for a less sum than that proved to be a customary rate of charges of architects, was properly excluded.

Cooper v. Gorgon, Court of Civil Appeals of Texas, 23 S. W. Rep. 608. 76.

TRANSFER OF MATERIAL MAN'S ACCOUNT DESTROYS LIEN.—The transfer by a material man to another party of his account for materials furnished in the construction of a building, before the filing of his claim for a lien, destroys the right to a lien, and confers no authority upon the assignee to file and enforce a mechanics' lien for such materials. The assignee, after such assignment, cannot perfect the lien by complying with the requirements of the statute.

Noll v. Kenneally, Supreme Court of Neb. 56 N. W. Rep. 722. 91.

FAILURE TO PROCURE ARCHITECT'S CERTIFICATE.—Final payment of the sum due a sub-contractor, from a builder for work performed cannot be refused on the ground that the sub-contractor had failed to procure an architect's certificate, as to the proper performance of his work, as required by the contract, where the architect has certified that the sub-contractor is entitled to a settlement, but without prejudice to any claim the builder might have for time lost or work done in carrying out the terms of the contract.

Grannis v. Hurd Lumber Co. v. Deever, Supreme Court of N. Y. 2 N. Y. Supp. 375. 91.

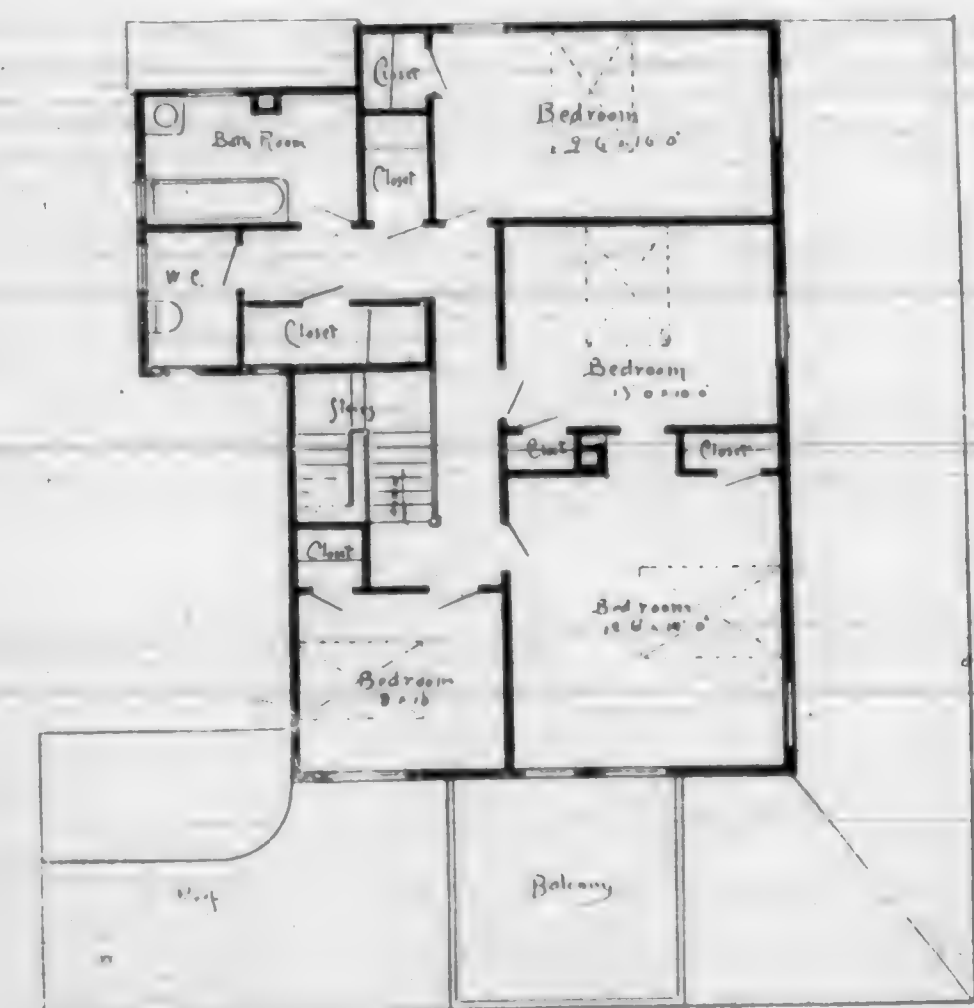
DAMAGES FOR BREACH OF CONTRACT.—Where one had contracted to build an ore dock according to certain plans, and to complete the same by the first of May, the timbers required for the work were of peculiar and unusual dimensions, and in order that the workmen be kept employed, it was necessary that the timbers be furnished at certain times; and as the dock had to be built in and over the water, it was necessary to an advantageous performance of the work that it be done while the ice remained on the water. In January a party with knowledge of these facts, agreed to furnish all the timber for the work in three monthly installments, his contract containing a provision that, "in the event of his inability to furnish all or any of said timber as proposed above, he agreed to allow the contractor to purchase the same in the open market, and charge the necessary expense to his account, the same as if he himself had purchased it." This did not amount to a stipulation for an exclusive measure of damages in case of a breach of the contract.

Williston v. Matthews, Supreme Court of Minnesota, 56 N. W. Rep. 1112. 175.

TENDERS TO BE RECEIVED.

Treasury Department, Office Supervising Architect, Washington, D. C., February 8, 1894. Sealed proposals will be received at the office of the Custodian of the U. S. Custom House, etc., and Old Appraisers' Stores buildings at San Francisco, California, until 2 o'clock P. M. on the 15th day of March, 1894, and opened immediately thereafter, for furnishing all the labor and materials required for the repairs, painting, etc., of above named buildings, in accordance with the specification and instructions of the Custodian. Copies of the specification may be had on application at the office of the Custodian at the buildings. Each bid must be accompanied by a certified check for a sum not less than 2 per cent of the amount of the proposal. The right is reserved to reject any or all bids, and to waive any defect or informality in any bid should it be deemed in the interest of the Government to do so. All bids received after the time stated for opening the same will be returned to the bidders. Proposals must be enclosed in envelopes, sealed and marked, "Proposal for Repairs, Painting, etc., of the U. S. Custom House, etc., and Old Appraisers' Stores Buildings," and addressed to, Mr. John H. Wise, Custodian.

Treasury Department, Office Supervising Architect, Washington, D. C., January 29, 1894. Sealed proposals will be received at this office until 2 o'clock P. M. on the 7th day of March, 1894, and opened immediately thereafter, for all the labor and materials and fixing in place complete the low pressure, return circulation, steam heating and ventilating apparatus required for the U. S. Post Office, etc., building at San Jose, California, in accordance with the drawings and specification, copies of which may be had at this office or the office of the Superintendent at San Jose, California. Each bid must be accompanied by a certified check for a sum not less than 2 per cent of the amount of the proposal. The right is reserved to reject any or all bids and to waive any defect or informality in any bid, if it be deemed in the interest of the Government to do so. All bids received after the time stated will be returned to the bidders. Proposals must be enclosed in envelopes, sealed and marked, "Proposal for the Low Pressure, Return Circulation, Steam Heating and Ventilating Apparatus for the U. S. Post Office, etc., building at San Jose, California," and addressed to, Jeremiah O'Rourke, Supervising Architect.



BOOKS AND PERIODICALS.

It is always interesting to read the impressions made upon foreigners on a first visit to America and in *NOTES ON MY VISIT TO AMERICA* a paper read by C. J. Cuthbertson, Common Councilman of the City of London, we have an account of the effect made upon a Londoner.

Here we have what struck him most strongly in New York:

"During our first walk we noticed the shops were large, bright and attractive. Many trams running, some drawn by horses, others by cable. Omnibuses few, drivers and conductors clean, smart and noisy; but the former are bad coachmen. Horses very lightly harnessed. Traps and carts very lightly made swarm in the streets; the most popular being the four-wheeled 'buggy'. Altogether a place of business, bustle and noise, is the first verdict of the new comer. New York is well planned, the streets run in parallel lines, and mainly distinguished by numbers. The houses very high, commonly rising six or eight stories, and built in blocks. In running up new houses, a foundation is prepared; an entire framework of iron erected, which is afterwards filled in with brick or stone, as required. In one of the squares a building was noticed with a frontage of white marble, producing a remarkably rich effect. Electric light advertisements here and there were very fine; in one instance four different lines of matter being displayed in as many different colours. The elevated railways running through the streets level with the first floors of the houses attracted attention. Although awkward in appearance, and in some cases injurious to business, by blocking the light from the shops before which they pass, they are yet found helpful to others, as they run every minute, stop at certain street corners, and the terminus only, thus giving great facilities to buyers in and around their neighbourhood. *En route* I was much amused at the free and easy attitude of the ticket collector, who was sitting in an armchair, with feet resting well up, coolly looking on while our tickets were placed in a box in front of him. All tickets by rail or car in New York are of the uniform price of 5 cents, and all of same class. The railway carriages are of light construction, while the railways themselves are almost unenclosed. Leaving Fifty-fifth street, I walked to Central Park, and was much struck by its extent and beauty. Within it is a large and excellent Zoological collection, open to all free of charge. Returning to the city, I noticed among the stores that of Stuart, which consists of an entire block, containing about a hundred separate shops. In New York we met with our first monetary experience, the most popular currency here being the Dollar Note, and one felt momentary surprise, when called upon to part with a note for 4s. 2d. The principal coins in use are ½ dollars, ¼ dollars, 10 cents and 5 cents. Weather was now very hot; majority wearing straw hats, otherwise in dress our cousins presented the appearance of quiet English gentlemen. Dress generally is here very expensive. Passing down Eighteenth street I paid a visit to the Fire Engine Station. The Captain informed me that in case of an out-break, everything could be got ready and despatched in *nine seconds*! Subsequently at drill we saw this feat accomplished."

It is evident by the following that natural wood finish is not so common in England as here.

"The blocks of mahogany and walnut were enormous, and the specimens from Australia, Canada and California very good. Speaking of woods, I observed that where this mater-

ial is used for interiors of houses it is simply planed and polished, or varnished, seldom or never painted."

The author's remarks anent the Electricity Exhibit at the World's Fair indicate that nowhere in the world has such an advance been made in its applications as in this country:

"We next visited and revisited the *Electricity Building*. This fairly astonished and entranced me. It baffles description. The American seems to be perfectly at home with the new light. Electricity is seen in all forms and devices on buildings and in streets, the effect in many cases being brilliant and imposing; the illumination of the grounds, statuary, boats, etc., by night was simply grand. On the summit of one of the buildings is an electric search light, which can be seen a distance of forty miles."

He thus curtly dismisses the tall buildings of Chicago with several notes of exclamation.

"As to the city itself, Chicago is noisy, bustling and busy. It is noted for containing the tallest houses in the world. I was invited to a Masonic Lodge on the *eighteenth story*! the house itself having no fewer than *twenty-two*!"

And winds up with the following tribute to the American character.

"Among our thoughts on the homeward trip was this, that, with the exception of a little extra smartness and alertness, our American cousins are, after all, one with ourselves; and personally I am bound to say that the kindness and courtesy uniformly extended to me in the States contributed greatly to the pleasure of a most enjoyable holiday."

LIPPINCOTT'S MAGAZINE for February, 1894. The complete novel in the February number of Lippincott's "The Picture of Los Cruces" is hardly up to the standard of the novels published in this magazine—the varied contents in other departments, however, will make it an interesting number to the general reader.

ELECTRICAL LITERATURE.—A monthly summary of current literature, Volume 1, No. 1. Published by Fred De Land, 565 The Rookery, Chicago, is intended to supply a brief synopsis, in a classified form, of each important article and editorial that may have any bearing on any phase of electrical engineering appearing in any publication, either American or foreign. While their publication cannot fail to be of great use to the Electrical Engineer and students of electricity; we fear the general public who care only for results accomplished, cannot be relied upon to support such a publication, upon reflection we may be saying too much, as there is a vast number of the public who are interested in this subject.

THE POTSDAM RED SANDSTONE CO., have favored us with a very artistic calendar for 1894. They enclose at the same time a report and an excellent likeness of the late Dr. Newberry and other experts of note.

The Potsdam Red Sandstone is doubtless all these expert says, but an account of the distance and cost of transportation has not interested the architects of this coast and those interested in building as it otherwise would. Beside this there is a feeling growing up in this community that we should look at home for building material. Encourage home industry, is getting to be the cry, and eventually it will be found we have building stone and marbles in our own state that cannot be rivaled or excelled.

BUSINESS MOSAICS.

Vulcan Iron Works.—Those in want of Architectural and Ornamental Iron Work cannot do better than give this company a call. To see the dainty stable fixtures will make you wish to build a new stable at once, or at any rate to remodel your old one; why a horse provided with such fixtures in his stable holds his head a trifle higher and looks down with contempt upon the unfortunate animals who do not have his advantages. Do not allow the feelings of your favorite horse to be hurt through the want of fixtures which are cheapest in the end—as they last long and save feed.

Teacher.—"Try to remember this: Milton, the poet, was blind. Do you think you can remember it?" "Yes, ma'am." "Now, what was Milton's great misfortune?" "He was a poet."—*American Grocer.*

Ruffino & Bianchi, importers and manufacturers of marble, granite, monuments, tombs, wainscoting, steps, tiling, etc. The good taste displayed by this firm, in a department that more than most others appeals particularly to sentiment and feeling should be a sufficient reason for crowding their works to their utmost capacity. Call and judge for yourself at 862 to 870 Bryant street, San Francisco.

Cholly.—I—I called to ask—er—er—HER PAPA—Yes, yes; you may have her! Take my blessing!! This is my busy day!! Get out!!—*Puck.*

We recently has a visit from Mr. W. S. Purnell, the travelling representative of Merchant & Co. of Philadelphia, whose specialties we have frequently noted in these columns.

Merchant & Co. continue to hold their own against numerous competitors by the excellence of their goods. About two hundred of the Star Ventilators will be used in the erection of the New French Hospital in this city, they having been chosen as being the best as well as the most economical.

Englishman.—"Beastly weather, h'isn't h'it?" AMERICAN—"Humph! The only creature that would like this weather is a duck, and a duck isn't a beast; it's a fowl. This is foul weather."—*New York Weekly.*

The Samson Cordage Works of Boston have issued their 1894 Catalogue and call especial attention to their "Samson Spot Cord." This cord has been put on to the market the last year to supply the demand that the Architects have made for a first quality Sash Cord which should be so marked that it could be identified at sight after the label has been removed from the low grade cords which are bought on account of the low price rather than on account of their wearing qualities. The "Samson Spot Cord" is the same quality and price as the regular "Samson" Cord, which has for years been so favorably known marked with a succession of a different color from the body of the cord. The company has adopted this device as a trade mark. Their catalogue describes this cord as being warranted of perfect braid and finish, and to be entirely free from waste stock, and purchasers may have confidence that the spot is a guarantee of quality. Samples will be gladly sent on application.

The Rapid Safety Filter.—To those who wish to retain good health, be wise in time, and order a Rapid Safety Filter, the office of the company is at 1209 Market street. These filters are endorsed by the leading physicians who strongly recommend their use. No charge is made by this company for fitting, keeping in order and cleaning the filter; the charge is very moderate and includes all these points, see their advertisement on page XII this journal. If you once commence with their use you are sure to continue it.

"Be mine, Amanda, and I'll treat you like an angel." "I daresay! Nothing to eat and still less to wear!"—*News Letter.*

Infringement of the Star Ventilator.—In the Omaha *Sunday World Herald*, of December 17th, appears a paragraph in regard to an alleged infringement of the patent of Merchant & Co.'s Star Ventilator. It would seem that the Star Ventilator was specified for the Lincoln, Neb., Hospital for the Insane and that the contractor placed other ventilators in the building which Merchant & Co. claimed to be infringements on their Star patents. Steps were accordingly taken to stop payment on the work pending an investigation. The matter was duly laid before the State Board of Public Lands and Buildings, with the result that the board decided to withhold a settlement with the contractor until he had made a satisfactory settlement with Merchant & Co. We are informed that Merchant & Co. have recovered heavy damages in the case.—*Metal Worker, January 6, 1894.*

"New York is a great place," said the tourist. "It has an Italian quarter, and a Chinese quarter, and a French quarter, but where is the American quarter?" "In the pocket of the hotel waiter," answered his American cousin.—*News Letter.*

Bolton & Strong.—The beautiful half-tones we have published of late were executed by these Photo Engravers, 430 Pine street, San Francisco. There is no doubt these gentlemen stand at the front in this class of work on this coast, indeed they do not take a back seat if we look the country over from east to west. Calling in the aid of the electric light they can work regardless of the state of the weather, clouds or sunshine.

"Why, oh why, do all men join in the mad rush for gold?" shrieked the female lecturer, who had acquired many years but no husband. "Because," yelled a voice from the back rows, "they have to do it to keep the women in clothes!"—*News Letter.*

Dunham, Carrigan & Hayden Co.—Builders' hardware in endless variety, including a complete line of Hopkins & Dickinson Manufacturing Co's Bronze Hardware, indeed, a visit to their bronze art room will well repay one, if only to see the various useful inventions, combining artistic taste with the every day essentials required by every builder. As dealers in hardware, iron and steel this firm are so well known, it is hardly worth while to say their establishment will be found at 17 and 19 Beale street, as well as 18, 20, 22 and 24 Main street, San Francisco, Cal.

Forgetfulness is a common failure of humanity, and everything that helps us to remember easily receives our hearty endorsement. Of just such a character is the "Daily Reminder," which the Bostwick Steel Lath Company, of Nilss, O., are now sending out to their friends and patrons with the compliments of the season for a Merry Xmas and a happy and prosperous new year. This little book is a complete diary and calendar combined, giving the day of the month, the day of the year, holidays, etc. Of course the company are anxious that reference to its pages shall also remind the reader that the Bostwick fire-proof steel lath is the best on the market and should be investigated by architects, plastering contractors and others who are trying to find a good lath to put into their buildings. This lath was awarded a premium at the World's Fair.

"It's very hard," said the water-meter, "I'm always registering, but I can't vote!"—*News Letter.*

The truth of the saying "the works of a good man lives after him" is illustrated by the success of the Joseph Dixon Crucible Company, though greatly enlarged and improved

since his death the same spirit governs the concern as when he lived, and the march of improvement is ever onward.

The sight of an excellent likeness of the late Joseph Dixon, reminds me of an occurrence that happened some years before his death, it gives a very good illustration of the fun that lurked under a somewhat austere countenance.

About the time when Pains claim of a great discovery was the talk of the day, and some people were ready to believe a revolution in gas making from water was about to be a certainty, Mr. Dixon announced a lecture upon the subject of Pains water gas, and proceeded from the platform to apparently perform the experiments that Pain had announced with a flourish of trumpets; water was decomposed, the gas collected, afterward carbonized and burst before the delighted audience. Mr. Dixon bowed his acknowledgments—"I should say before you go—there is one little point of difference, my machine is of wood though the magnets are painted to represent iron." Up jumped an indignant man and said, "If that is so I pronounce the thing a humbug." "You have characterized it exactly, the object of the lecture is accomplished," replied Mr. Dixon.

CITY BUILDING NEWS.

Carl near Cole. Two-story frame; owner, Wm. Lang, Jr.; architect, Emil John; contractors, Schutt & Kreeker; signed, Jan. 17; filed, Jan. 19; cost \$7700.

California near Sansome. Alteration; owner, Josie Guareola; architect, Clinton Day; contractor, J. H. Wilson; signed, Dec. 4; filed, Jan. 31; cost \$3,250.

California street, No. 1919. An annex, theatre and ballroom; owner, M. H. DeYoung; architect, A. Page Brown; contractors, Mahoney Bros.; cost \$10,000.

Commercial and Leidesdorff. Repairs to brick building; owners, Howard Estate; contractor, J. V. Lawrence; cost \$5500.

Commercial bet. Leidesdorff and Sansome. Repairs to brick building; owners, Estate of Capt. Thomas; contractors, Mahoney Bros.; cost \$10,100.

Clayton near Waller. To build; owner, L. F. Crane; architect, John Conant; contractors, McCulloch & Glunz; signed, Jan. 23; filed, Jan. 25; cost \$2655.

Devissadero near Grove. One-story frame; owner, Mrs. M. Moeker; architects, Percy & Hamilton; contractor, J. House; signed, Jan. 24; filed, Jan. 26; cost \$2000.

Ellis and Hollis. Brick, carpenter and mill work, etc.; owner, Blanche Converse; architects, Shea & Shea; contractor, Ed. Mooney; signed, Jan. 15; filed, Jan. 20; cost \$10,570.

Ellis and Hollis. Sewering, plumbing, etc.; owner, Blanche Converse; architects, Shea & Shea; contractor, P. F. Ward; signed, Jan. 15; filed, Jan. 20; cost \$1200.

Elbert bet. Hyde and Leavenworth. Two-story frame; owner, Chas. Grasse; contractor, Geo. Weismann; cost \$3800.

Elbert and Taylor. Two-story frame; owner, P. L. M. Peters; contractors, Dean & Worden; signed, Feb. 1; filed, Feb. 1; cost \$1900.

First near Minna. Three-story brick building; owner, M. Samuel; architect, Emile Depierre; contractors, John Dunphy & Co.; signed, Feb. 2; filed, Feb. 3; cost \$5,300.

Fulton and Webster. Alterations and additions; owner, Elizabeth Moore; contractors, Home Building Co.; signed, Jan. 24; filed, Jan. 26; cost \$3600.

Golden Gate Ave. between Lyon and Lott. To build; owner, Joe Wurdack; architect, Emil John; day work; cost \$4000.

Golden Gate Ave. near Lott. To build; owner, John N. Macklin; contractor, Arthur Stevens; signed, Jan. 10; filed, Jan. 26; cost \$3320.

Greenwich near Hyde. To build with observatory; owner, Jas. F. Gassmann; contractor, C. A. Henderson; signed, Jan. 18; filed, Jan. 19; cost \$3000.

Greenwich bet. Stockton and Powell. To build; owner, Jane Trubody; contractor, E. A. Thompson; signed, Feb. 2; filed, Feb. 5; cost \$2600.

Howard near 10th. Two-story frame; owner, H. H. Oelling; architects, Townsend & Wyneken; contractor, F. W. Kern; signed, Jan. 12; filed, Jan. 16; cost \$4350.

Howard near 5th. Excavating brick and carpenter work tinning, etc.; owner, H. W. Frank; architects, J. C. and E. A. Mathews; contractor, D. J. Brennan; signed, Feb. 7; filed, Feb. 10; cost \$10,300.

Jackson near Laguna. Carpenter, mill work, etc.; owner, Samuel M. Rosenbaum; architect, Samuel Newson; contractor, Martens J. Gallagher; signed, Jan. 29; filed, Jan. 31; cost \$8650.

Jackson near Laguna. Sowers, plumbing, etc.; owner, Samuel M. Rosenbaum; architect, Samuel Newson; contractor, Samuel Ichelheimer; signed, Feb. 2; filed, Feb. 3; cost \$1413.

Leidesdorff and Clay. Repairs to brick building; owner, E. J. Shattuck; contractor, A. C. Hussey; cost \$1600.

Lott near Golden Gate Ave. A frame dwelling; owner, Mrs. Flora Ellison; architect, J. Cather Newson; contractor, Louis Landler; signed, Jan. 23; filed, Jan. 25; cost \$6,150.

Lombard and Greenwich Alley. Alterations and additions; owner, P. Castagnetto; architects, Townsend & Wyneken; contractor, C. Paff; signed, Feb. 9; signed, Feb. 10; cost \$2700.

Market and Montgomery. Hardware interior; owner, Union Trust Co.; architect, Clinton Day; contractors, Mahoney Bros.; cost \$1600.

Market and Montgomery. To build; owners, Union Trust Co.; architect, Clinton Day; sub-contractor, L. & E. Emanuel; cost \$6150.

Market and Montgomery. Mill work; owner, Union Trust Co.; sub-contractor, Andrew Wilkie; cost \$800.

Pacific Ave. near Laguna. Alterations; owner, J. A. Carlt; architect, T. J. Welsh; contractor, W. F. Wilson; signed, Feb. 2; filed, Feb. 12; cost \$1010.

Pacific Ave. near Laguna. Painting, etc.; owner, J. A. Carlt; architect, T. J. Welsh; contractor, M. J. Donovan; signed, Feb. 9; filed, Feb. 12; cost \$1670.

Pacific Ave. near Octavia. Two-story frame; owner, Mrs. Johanna D. Jolliffe; contractor, Willis Polk; signed, Jan. 25; filed, Jan. 26; cost \$4700.

Pacific Ave. near Laguna. Brick work, art stone, etc.; owner, J. A. Carlt; architect, T. J. Welsh; contractor, J. W. Smith; signed, Jan. 31; filed, Jan. 31; cost \$7385.

Post near Leavenworth. Painting, etc.; owners, S. F. Verein Association; architects, Salfeld & Kohlberg; contractor, H. F. Wagner; signed, Jan. 11; filed, Jan. 18; cost \$2350.

Powell and Jackson. To build; owner, Second African Methodist Church; architect, H. Gelfuss; contractors, Brucher & Griffith; signed, Jan. 20; filed, Jan. 20; cost \$4705.

Pine near Buchanan. To build; owner, Louis Erclander; architect, J. F. Sherman; contractors, Currie & Loomer; signed, Feb. 5; filed, Feb. 6; cost \$3825.

Powell bet. O'Farrell and Geary. Alterations; owner, Geo. B. Tay; contractor, Wm. Little; cost \$4250.

Scott near Page. To build; owner, Geo. H. Luchsinger; architect, H. Gelfuss; contractors, Schutte & Kreeker; signed, Jan. 20; filed, Jan. 20; cost \$5500.

Tremont Ave. near Fredrick. One-story cottage; owner, Geo. Offerman; architect, Emil John; contractors, J. A. McDonald & McDonald; signed, Feb. 2; filed, Feb. 8; cost \$2000.

Van Ness Ave. and Myrtle. Painting and tinning; owner, C. F. Buckley; architect, M. J. Lyon; contractor, L. J. Dwyer; signed, Feb. 6; filed, Feb. 10; cost \$2393.

Van Ness Ave. and Myrtle Ave. Grading, concrete foundation, brickwork, etc.; owner, C. F. Buckley; architect, M. J. Lyon; contractors, Martin & James Fennell; signed, Feb. 6; filed, Feb. 8; cost \$7250.

Van Ness Ave. and Myrtle Ave. Plumbing, etc.; architect, M. J. Lyon; contractors, Ford Bros.; signed, Feb. 6; filed, Feb. 8; cost \$2000.

Van Ness Ave. and Myrtle Ave. Carpenter and iron work; owner, C. F. Buckley; architect, M. J. Lyon; contractors, Wm. Knowles and Geo. Reichley; signed, Feb. 6; filed, Feb. 8; cost \$26,000.

Vallejo near Buchanan. To build; owner, Louis Holy; architect, H. Gelfuss; contractor, James McLean; signed, Feb. 2; filed, Feb. 2; cost \$4194.

Virginia near California Ave. One-story frame; owner, E. Powers; contractor, James J. O'Brien; signed, Jan. 19; filed, Jan. 19; cost \$1200.

Virginia near California Ave. One-story frame; owner, Michael Mahoney; contractor, James J. O'Brien; signed, Dec. 2; filed, Jan. 19; cost \$1200.

The California Architect and Building News.

Copyrighted 1894, by the California Architectural Publishing Company.

OFFICE, 408 CALIFORNIA STREET,

SAN FRANCISCO, CAL., U. S. A.

VOLUME XV.

MARCH 20th, 1894.

NUMBER 3.

A MONTHLY JOURNAL DEVOTED TO THE ARCHITECTURAL INTERESTS OF THE PACIFIC COAST.

Published on or about the 20th of each month by The California Architectural Publishing Company. The Stockholders being Architects and others interested in the profession.

SUBSCRIPTION TO THE JOURNAL, \$3.00 PER YEAR IN ADVANCE.

ESTABLISHED 1879.

INCORPORATED 1889.

NOW IN THE FIFTEENTH YEAR.

W. J. CUTHBERTSON, President.

OLIVER EVERETT, Secretary.

Remittances should be in the form of postal orders, payable to THE CALIFORNIA ARCHITECTURAL PUBLISHING COMPANY, and all communications addressed to the office of the Company, 408 California Street, San Francisco, Cal.

ADVERTISING RATES:

Space	1 Month.	3 Months.	6 Months.	12 Months.
1 inch.....	\$ 1 00	\$ 4 00	\$ 7 50	\$ 13 00
2 inch.....	2 00	10 00	18 00	35 00
3 inch.....	4 00	18 00	32 00	60 00
4 inch.....	7 50	35 00	65 00	125 00
1 Column.....	12 50	57 50	105 00	200 00
1/2 Page.....	20 00	110 00	200 00	350 00
1 Page.....	40 00	220 00	400 00	700 00



THE American Institute of Architects has been making strenuous efforts to bring about a reform in the Government's method of designing and erecting the Federal buildings of this country.

The Secretary of the Treasury, has at present, control of all buildings of this class, and the actual work is done by a bureau in charge of a Supervising Architect.

At the earnest solicitation of the American Institute of Architects, Secretary Carlisle promised the Committee that waited on him, that he would try the competitive method if Congress would authorize it; so the Committee prepared a bill and the last Congress made it law, authorizing the Hon. Secretary of the Treasury to procure designs for public buildings through public competitions, as advocated by the Institute.

No action was taken under this authorization. Not long ago the Government had occasion to erect a public building in Buffalo. The design adopted was severely criticized by the Buffalo Chapter of the Institute who protested against the adoption of a design which they characterized as unsuitable and unworthy of the purpose for which it was designed and the occasion was taken by President Burnham of the Institute, to urge on Secretary Carlisle the exercise of his prerogative.

Secretary Carlisle has positively refused to do so, and the reform appears to be no nearer realization than before.

This refusal of the Secretary to take action in the matter

is really discouraging—the evils of the present system are admitted, but instead of trying to ameliorate them, the authorities seem determined to plod along in the old way.

The Institute has endeavored for years to secure proper recognition for the noble art of architecture, and is bound to succeed in the end.

In the mean time it is justly indignant that its exertions have met with no better appreciation by the government officials, and in concluding the correspondence with the Secretary of the Treasury concerning the law as it now exists, President Burnham uses this sentence:

"You now inform us, in effect, that the law must be amended before you will act under it. I can see but one amendment which is needed to insure the satisfactory working of this measure; i. e., the introduction of a clause ordering the Secretary of the Treasury to carry out its plain intent and purpose, and not leaving it to his discretion."

The Hon. Secretary of the Treasury seems to consider the method that has produced some of the noblest monuments of the old world, as not worthy of trial in this country, and refuses to learn through the experiences of other nations.

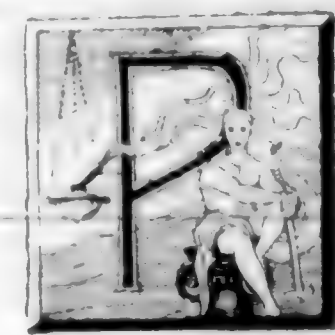
We have no intention of reflecting on the professional ability of the incumbents of the office of Supervising Office of the Treasury, past or present, they have undoubtedly done the best they could under the unfavorable circumstances in which they work.

But think of it! Is it not ridiculous to expect that any one man is able of attending to and designing and erecting all the public building necessitated by the requirements of

a nation of sixty millions—even the layman should see the absurdity of expecting any one man, no matter how capable, to achieve such a task in as satisfactory a manner, as if the combined abilities of the foremost men in the profession were employed to the same end.

We extend to the American Institute of Architects our hearty good wishes and encouragement in their work of securing fitting recognition for a noble art, that was better appreciated centuries ago by an earlier, and we regret to think, possibly a more enlightened civilization.

FUTURE SUPPLY OF SKILLED LABOR IN THE BUILDING TRADES.

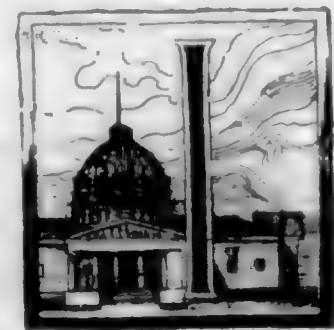


RESIDENT Hersey, in his address at the recent convention of the National Association of Builders, in Boston, pays much attention to the question of future supply of skilled labor in the building trades. He bewails the decay of the apprentice system, and favors among other remedies, the establishment of trades schools. It is to be hoped that so much of the address may bear fruit in inclining some of our wealthy people who are desirous of leaving monuments of their philanthropy, to see in this comparatively new field a chance to do the right thing. It is high time that charitably disposed people inquire if there are not other and more promising openings for their bequests than hospitals and so-called higher institutions of learning. It is true that the public schools are doing more than formerly in the direction of manual training, but it is impossible for them to do much in the way of serious preparation for the shop. Manual training is to be encouraged as helping in the direction of a better balanced education, or at the worst, as a recreation to the pupil. It cannot teach how to do the work required in the trades. Some very limited attempts to revive the apprentice system have of late been made with fair success, but there is slight chance of the revival becoming general. Trade schools have not as yet been sufficiently tested to have established an unassailable reputation, but there is a pretty general belief that they must be pretty poor not to be an improvement on the present state of things. In a sense, much less is required of a mechanic now than formerly, so much machinery, and so much specialization of work being the order of the day. Naturally enough one would expect to get a higher order of work from men of whom but a few things were required; but the expectation is not borne out in the building trades of to-day. The architect, if a good superintendent of construction, finds it necessary to establish a sort of trades school on a considerable percentage of his buildings. From the laying of the footing stones to the finishing of the building, he finds men, who, with drawings and specifications before them, and with plenty of the best of building materials, will not get good results without much special effort on his part in the way of actual teaching. It certainly was different under the old system of apprenticeship, for a mechanic who was "dragged up" as a "cub" in those days certainly knew how to do a good many things well. While an apprentice, he was usually taken in hand by a journeyman, who while he required a great deal of drudgery, took a commendable pride in seeing that he got into the way of doing things well, and once being able to do a thing properly it was not advisable for him to relapse. It was then a merit to get a good job out of indifferent materials, whereas now one is so often discouraged in attempts to get good work from men provided with the best of materials. With so much better scientific knowledge at our disposal than formerly, the whys and wherefores may be

placed at the disposal of the pupils of trades schools, and along with the reasons for good work, a degree of skill may be taught that will be very helpful. If we may reason from the results of the schools in departments of design, trade schools cannot come too soon. As to President Hersey's other principal remedy for the degradation of skilled labor, the stopping of foreign immigration, he would have done well to give the subject more careful study, and not to have proposed it at all. The effect of the discontinuation of immigration would be very likely to leave us in a position to see some of our own shortcomings a little better, perhaps, which would be well enough in its way, although not exactly what we most desire; but it would, we fancy, leave us very short of help as a general thing. As the case now stands we would in a normal business season be at a great loss to carry on the building operations of the country if we were to insist on using only native workmen, who, although they may be very superior to all others, may certainly learn some things yet, even from those of foreign birth who do so much of the skilled work about buildings, and many of whom certainly rank well in their several trades.—*The Architect, Builder and Decorator.*

DETAILING OF THE ROOF TRUSSES FOR THE MANUFACTURERS AND LIBERAL ARTS BUILDING, CALIFORNIA MIDWINTER FAIR.

BY D. E. CONDON, M. E., C. E., A. M. INST. C. E.,
MILLS BUILDING, SAN FRANCISCO.



IN dimensioning the various members of the roof trusses designed for the Manufacturers and Liberal Arts Building of the California Midwinter Fair, and proportioning their connections, the primary essentials were:

FIRST—A determination of the strains due to the *dead loading*; that is to say the entire weight of the roof material, purlins, etc., in one panel or space between two trusses, including the weight of one truss itself, regarded as symmetrically distributed.

SECOND—A determination of the strains due to the probable maximum *wind force* acting on one side of the roof surface.

THIRD—A determination of the maximum strains due to the *combined* action of the dead loading and wind force.

There are seventeen trusses in the entire length of the building, spaced twenty-two feet between centres, and twenty-two feet between each end truss and the adjoining gable.

The roof proper is a cylindrical surface of inch boarding, broken at the crown by a skylight; and its weight is carried to the trusses by means of 4"x12" purlins over twenty-two feet long and spaced two and a half feet between centres.

The *dead loading* was estimated at twenty pounds per square foot of roof surface, and the resulting *dead loads* at the upper panel points A, B, C, D, E, D', C', B', A' (see accompanying diagram of truss) were determined accordingly. The corresponding strains were then computed.

The *wind force* (acting horizontally) was taken at a maximum of thirty pounds per square foot on a plane surface at right angles to its direction; and on this basis the *magnitudes and directions* of the resultant wind forces at the upper panel points A, B, C, D, E, on the wind side were also determined. The strains due to these forces were then computed for the various members both on the wind and lee sides.

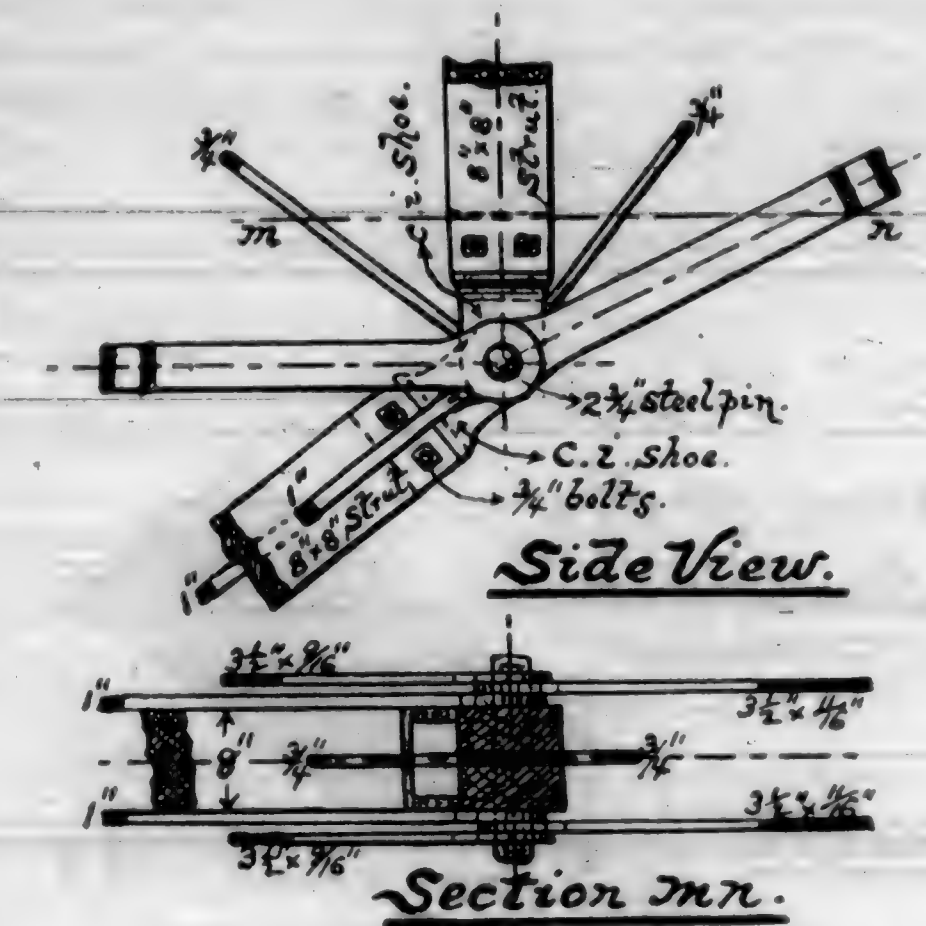
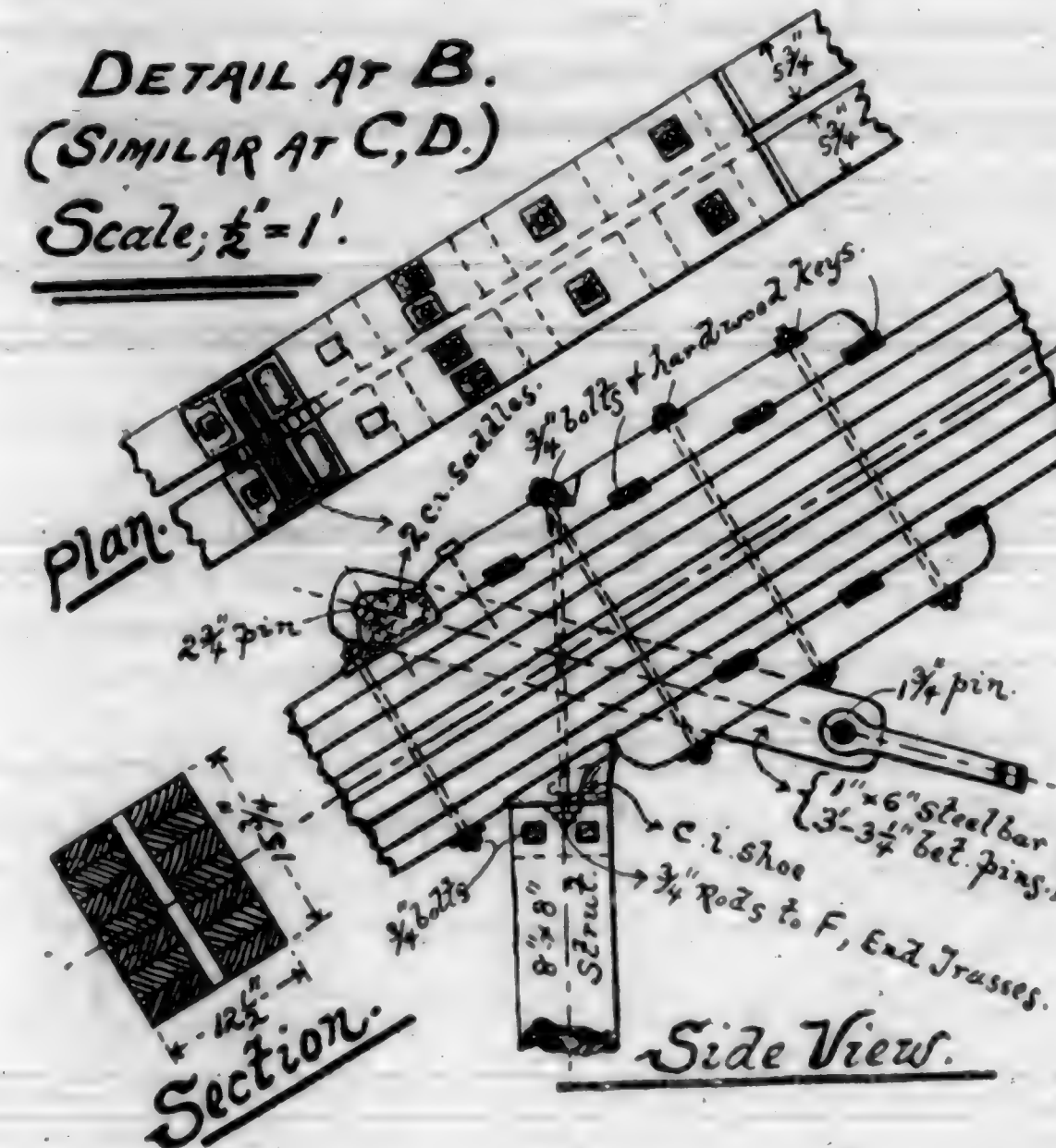
By a proper combination of the latter strains with the dead load strains, the *maximum tensile and compressive*

strains to be provided for in designing the various members and their connections were arrived at.

All the compression members were made of white pine wood.

The top A C E C' A' (commonly called "upper chord," after the corresponding member or upper flange of girders) was designed to directly sustain the roof purlins, and consequently had to be made circular. The material used being wood it became necessary to form the arc of a laminated or built beam, with scantlings of thickness and length properly proportioned to the curvature, breaking joint and bolted together every two feet. See annexed *Detail at B.*

DETAIL AT B.
(SIMILAR AT C, D)
Scale, $\frac{1}{2}''=1'$.



DETAIL AT F. Scale, $\frac{1}{2}''=1'$.

The vertical struts M L, M' L' were not provided with a cast-iron shoe at upper end; but the end was gained one-half inch into lower lamina, and tenoned between the two halves of the laminated beam. The lower end of each of these struts was provided with a cast-iron shoe, similar to that at F, G, H, K, (but smaller, $\frac{3}{4}''$ metal) with a $1\frac{1}{4}''$ pin connecting all the tension members at the point.

The oblique struts F P, F' P' were provided with a cast-iron shoe at upper end, same as that at the lower end of the vertical strut at same points, only the projecting eye-ribs are six inches apart. The lower end of each of these struts has no cast-iron shoe, but is gained into and secured between the two 12"x12" upright posts (six inches apart) of the side frame-work.

All the main tension members were made of steel—flat eye-bars and rods—each proportioned to its maximum strain, with a factor of safety of about three (3) within the elastic limit of the material.

The secondary bracing members (a F, F b, etc.) were all made of $\frac{3}{4}''$ wrought-iron rods.

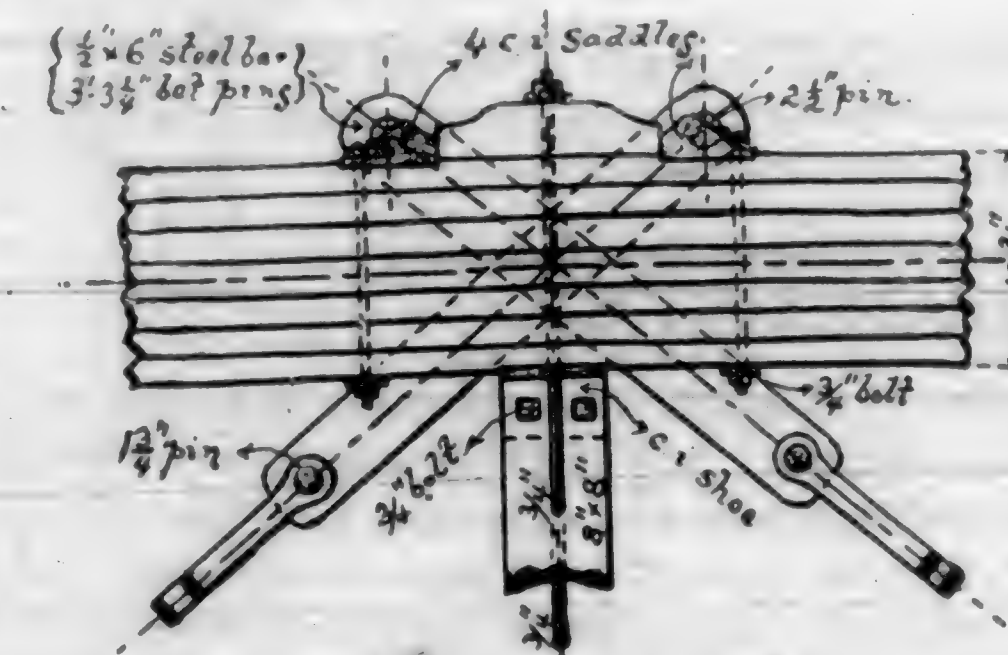
The connection of the members at the various points were all made by means of turned steel pins properly proportioned to the maximum shearing and bending strains.

The connection between the diagonal tension members and laminated beam at B, C, D were made by means of a flat steel bar (1"x6", 3'3 1/4" between pin centres) with pin connection between the two member-flats at its lower end, and a pin bearing on two cast-iron saddles at its upper end. See *Detail at B.* The bar passes up between the two halves of beam, and each saddle is slightly gained into and bolted to the half-beam on which it is secured. The component tendencies to sliding along the beam, of the saddles and upper shoe of strut, are mainly counteracted by means of two pieces of wood extending across, and bolted through and keyed to, the two halves of beam. The upper piece has its end opposed to the faces of the saddles, and the lower one has its end opposed to the face of strut shoe. Each saddle is prevented from side movement at the same time by the bolt at its back end, and a projection at the face end which enters the upper lamina of beam.

The connection at the crown E is somewhat different.

The division of the laminated beam into two equal parts with a space between, provided for the connection of the other members to it, and gave scantlings which could be more easily obtained in the market, without at the same time reducing the strength.

The vertical struts BF, CG, DH, EK were made of square section, with a cast-iron shoe at upper end, slightly gained into the lower lamina of beam, and bolted to both beam and strut. See *Detail at B*, and annexed *Detail at E.*



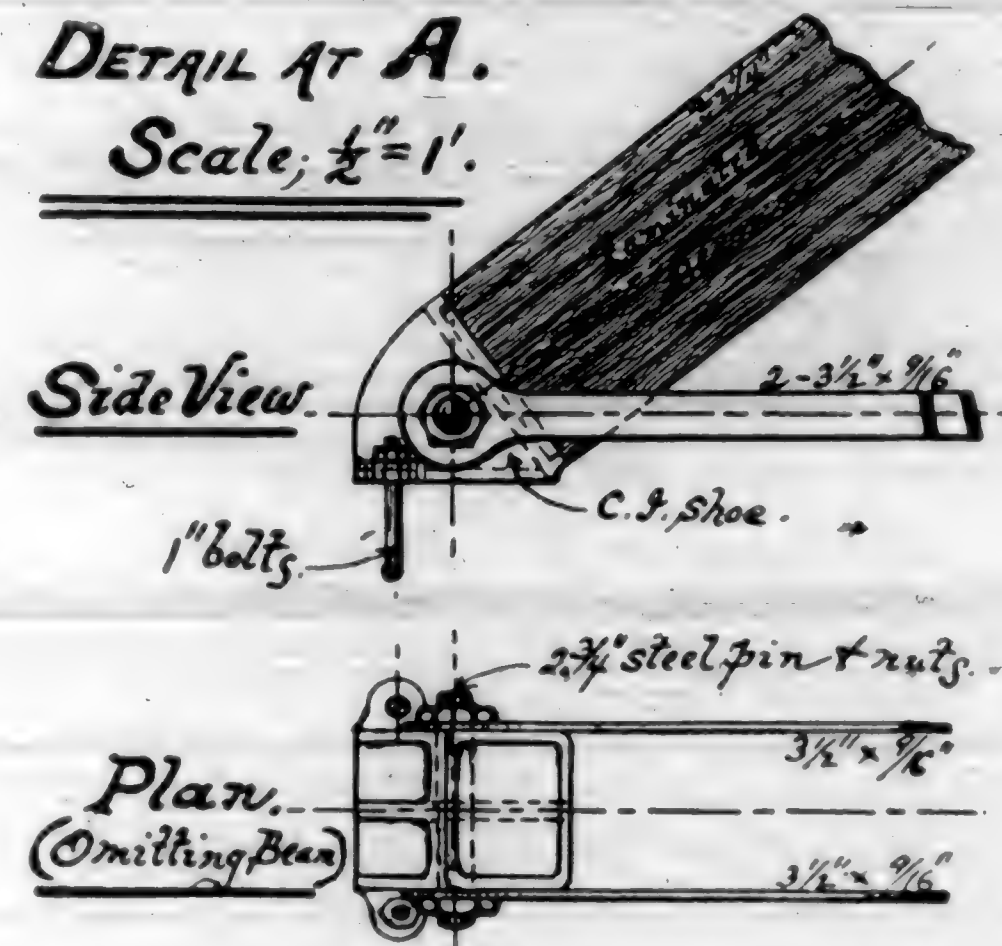
DETAIL AT E.
Side View. Scale, $\frac{1}{2}''=1'$.

The lower end of each of these struts was also provided with a cast-iron shoe, similarly bolted to the strut, and having two sufficiently strong webs or ribs (1" metal) projecting

The steel bars are only $\frac{1}{2}$ " thick, but with the same distance ($3\frac{3}{4}$ " between pin centres and the cast-iron saddles are smaller. See Detail at E.

The connections between the vertical main and secondary tie rods, and the laminated beam were made by means of nuts at ends of rods, with wrought-iron washers seated on and secured to the upper side of beam.

The ends (A, A') of the laminated beam were provided with cast-iron shoe bearings, with pin connection to tension members; and the shoes were firmly bolted down to the supporting frame work. Annexed Detail at A.



All the roof purlins were secured to the laminated beam of the trusses, and the beams of all the trusses were connected by a system of $\frac{3}{4}$ " diagonal tie rods.

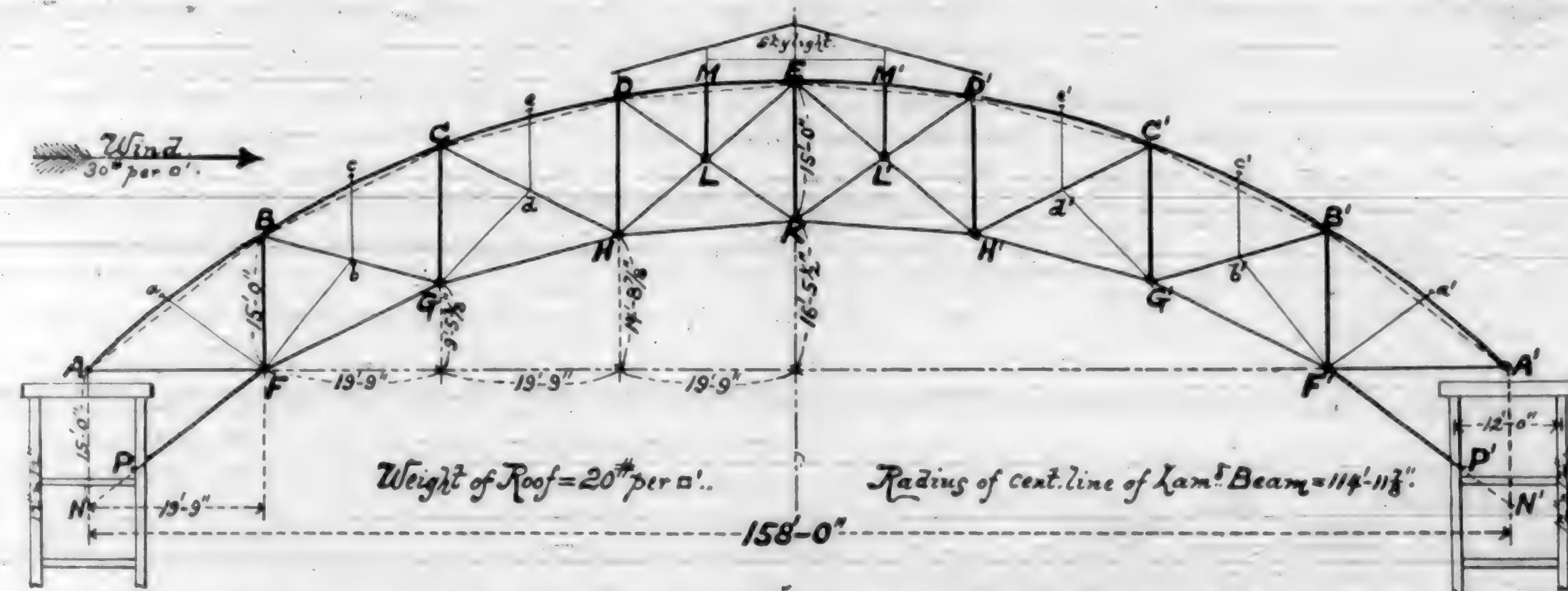


DIAGRAM OF ROOF TRUSS - MANUFACTURES & LIBERAL ARTS BUILDING, CALIFORNIA MID-WINTER FAIR.

MAIN BRACING MEMBERS, DIMENSIONS AND LENGTHS.

AF, 2 eye-bar flats, $3\frac{1}{2}$ " x 9-16", 19'9"	between pin centres
FG, " " $3\frac{1}{2}$ " x 11-16", 21'10 11-16"	" "
GH, " " $3\frac{1}{2}$ " x 15-16", 20'5 3-8"	" "
HK, " " $3\frac{1}{2}$ " x 15-16", 19'9 3-8"	" "
BG, " " 2" x 9-16", 18'6"	" "
CH, " " 2" x 1-2", 20'0"	" "
DL, " " 2" x 1-2", 9'10 13-16"	" "
LK, " " 2" x 7-16", 11'10 13-16"	" "
LE, " " 2" x 7-16", 10'11"	" "
HL, one 1" rod, with turnbuckle, 12'11 1-4"	" "
BF, CG, 8"x8" strut for the fifteen intermediate trusses,	

with two $\frac{3}{4}$ " rods, 16'3" long between pin centre and screw ends, one on each side of strut, for the two end trusses, to provide for gable bracing.

DH, EK, 8"x8" strut, with two $\frac{3}{4}$ " rods, 16'3" long between pin centre and screw ends, one on each side of strut, for all seventeen trusses.

ML, 6"x6" strut, with two $\frac{5}{8}$ " rods, 8'10" long between pin centre and screw ends, one on each side of strut, for all seventeen trusses.

FP, 8"x8" strut, with two 1" rods, 18'5" long between pin centre and screw ends, one on each side of strut, for all seventeen trusses. The ends of the rods are provided with cast-iron bevel washers bearing on the inside of the two 12"x12" upright posts of the frame-work.

SECONDARY BRACING MEMBERS, DIMENSIONS AND LENGTHS

With pin connections at b, d, etc., between and independent of the main flat bars at these points.

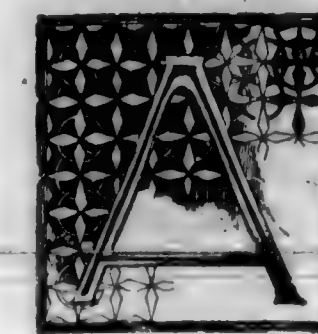
aF, one $\frac{3}{4}$ " rod, 13'11"	between pin centre and screw end.
Fb, " " 15'8 37-64"	between pin centres.
bG, " " 10' 33-32"	" "
bc, " " 8'10"	between pin centre and screw end, with forked end at b.
Gd, " " 14'1 29-32"	between pin centres.
dH, " " 11'0 3-64"	" "
de, " " 8'10"	between pin centre and screw end, with forked end at d.

The gable bracing will be described in next issue.

The California Architect has published some plates of the buildings of the Midwinter Fair that exceed anything done by their Eastern contemporaries during the World's Fair. The work is most creditable, and the pictures in one number worth the subscription for a year. We, in common with all

interested with journalism on this Coast, feel a pride in the California Architect. It is made up in a manner that blends taste with the utilitarian in an art that more than any other depends upon an interchange of ideas and thought in an art that is universal, and for that reason, one that restrains the selfish idea of exclusiveness, widens views, and leads to a higher civilization. It is, moreover, marching with rapid strides into the field of computable quantities. The taste that provides external grace remains, but added to this comes the internal engineering problems of electrical apparatus, elevators, provision for steam power, general heating, with many other elements added in the last few years. — Industry.

THE OWNERSHIP OF DRAWINGS MADE FOR AND BY AN ARCHITECT.*



LETTER is a document which, by means of words, attempts to supply to the reader some information from the writer; even after signature this, until delivery to the Post-office, or until delivery by some other means (the difficulties respecting a letter in transitu need not here be discussed), is held to be the absolute property of the writer, unless by agreement he has previously parted with that property. After delivery (if there has been no such agreement), either party may by injunction prevent the publication of the document; but before proceeding to that step, in cases where the Post-office is not the medium of transmission, the delivery to the reader or to an agent specially appointed by him to receive the document must be proved by the recipient. An architect's drawing has the nature of a written document, and is invested with all the qualities of a letter, as soon as it has received his signature, or the formula, "To be returned to the office of A. B.," etc., or even "From the office of A. B.," etc. A drawing is any combination of two or more lines which expresses form more clearly than any amount of description could do. In exception to this definition, some persons might produce copies of photographic pictures, and inquire where the lines are to be seen; others might bring forward shadowed representations of buildings in which no lines appear. The reply is, that no man could have made such a copy or such shadowed drawings without first drawing the lines, which have subsequently been erased.

Architectural drawings are technically known as "sketches" of plans, or sections, or elevations, or perspective views; Draught. (this term is nearly obsolete, because the words "rough plan," etc., are too generally used in an office for "rough draught of plan," etc.), and sometimes scaled to a modulus; General Drawings, always scaled to a foot; Detail Drawings, either at full-size or at an aliquot part of that size; Show Drawings, for exhibition to the client, to the architect's friends and to the public; a drawing in any one of these classes may be either "rough" or "finished," but is not necessarily an original design—the words "design" and "drawing" are so frequently used with indifference as to their separate meanings, that it may be useful here to insist that a design means a project, an idea, which may be very good although expressed in a bad drawing, just as, on the contrary, good drawing may be wasted upon a bad design; and copies or repetitions, which may be either counter-drawn by transfer, or duplicates by tracing or by using the rule and compasses, or enlarged or diminished copies produced by hand or by machinery. The term "Working-drawings" once meant the general drawings drawn so large as to show construction, or to admit of minute dimensions to save mistakes by workmen unused to scales; but now all detail drawings may be included. As to Original Drawings, all from which copies are made are original; however, since an assistant's work has been allowed to pass under the master's name, an original drawing by the master is one which he has himself made. Competition Drawings are finished general (and sometimes detail) drawings submitted in competition with other architects; in a few exceptional cases drawings of the design to a small scale have been at first required, and a selection has been sealed, for verification by the adver-

* During the period when the important subject of the ownership of drawings was under consideration—a question raised by the demand made by the Office of H. M. Works, etc., on the late Edward Barry, for the drawings made by his father in carrying out the designs for the House of Parliament—my brother the late John W. Papworth, undertook to collect the views generally held by members of the profession, and wrote them out with comments. His notes, which were found, at his death, among numerous other papers in his desk, are given in the above posthumous article. See for other articles on this subject, Vol. VIII, N. S., (Journal of the R. I. B. A.), pp. 109, 188, 231, 254, 404.—WYATT PAPWORTH.

tising body, from which the larger drawings have been made, and again submitted in final competition. Prize drawings are the successful Competition drawings, although the present day speaks of "premiated prize-drawings" when the competition has been made as a scholastic exercise for a small sum of money, or for a medal, or for books, etc., commonly called a "prize."

When the conditions of competition include a provision that the prize-drawings shall become the property of the donor of the premium, without the addition of words to the effect of "on delivery of the premium," the architect enters into a speculation of making drawings for approval, purchase and payment. The drawings on approval become the property of the donor of the premium, who in the present state of the law of artistic copyright has the power to sell, or lend, or publish them forthwith, without fear of any interference on the part of the architect, who must formally sue the donor for the premium as a debt, unless the architect by some indiscretion has deprived himself even of that remedy.

It is clear that a body corporate having a common seal may advertise for competition designs, receive them, approve two or more sets of drawings, and refuse to proceed to the adjudication of the premiums (on the ground that the advertisement was not a copy of a contract made under seal) until a more satisfactory opportunity; yet the architects cannot compel the body corporate to return the approved drawings; and it is doubtful whether they could compel them to proceed forthwith to adjudication and payment; yet the drawings would be legally in possession of the corporation, if not legally its absolute property.

The drawings made by an architect's assistant in the architect's office absolutely belong to the architect until he parts with his property in them, and this whether the assistant be paid (even if there be a debt due to him in respect thereof) or otherwise. This property depends on the fact that the drawings are made on paper, or vellum, etc., provided by the architect. Hence the clause in Articles of Pupilage that the pupil is to provide all instruments and materials except paper.

The drawings made by an architect's assistant out of the office, for the architect, absolutely belong to the architect until he parts with his property in them, even before he has paid to the assistant the price of the work. This property may arise in one of two ways: either the drawings are made on paper or vellum, etc., provided by the architect, in the same manner as a solicitor supplies to his surveyor the parchments on which the surveyor is to make duplicate drawings; or else the drawings have been made on paper or vellum, etc., provided by the assistant, and the architect, by agreeing to have them, acquires the property in them; but, in both cases, the assistant has a lien upon the drawings, or any part of them, for the whole price, unless he has agreed to receive the price at a future day, or takes security for the debt.

Not to omit what may at first sight seem to be an almost extinct branch of the subject, it may be observed that a century or more since, when vellum was more used, paper much dearer, and assistance perhaps worse remunerated than at present, agreements as to the usefulness of assistant's work were settled by destroying the material, a habit said to have been preserved to his later years by Sir John Soane, who did not hesitate to ask the assistant for his penknife, with which Soane reduced, at two diagonal cuts, the drawing into four triangles. Even now, the destruction of a pupil's drawing is taken as the strongest mark of the architect's disapproval. But, of late years, the principle *caveat emptor* has been so triumphant that if the architect does not take care too see satisfactory samples of his proposed assistant's skill, he had better not refuse an unsatisfactory drawing, but, (after pointing out the defects and getting them rectified as much as possible) accept, without manifesting displeasure, the finished work which is tendered to him. And if the architect, during the progress of work done out of the office, should see evidence of carelessness, incapacity or ignorance, he had better say that the drawing at that stage will suit his purpose, as if it were completed; and, upon payment even of the price originally fixed, withdraw it. To leave a drawing under a continuous lien is not satisfactory.

To be Continued.



The management of this journal desires to extend a cordial invitation to all architects on this coast and elsewhere to contribute designs for publication.

Drawings should be made with perfectly black lines on a smooth white surface. Good tracings, if made with black ink, answer the purpose.

The designs selected will be published without charge. All drawings, whether accepted or not, will be returned to their authors, who must bear express charges both ways.

E VANGELICAL Swedish Mission Church, Jessie street, Seth Babson, Architect.

H N Entrance by J. H. Powers.

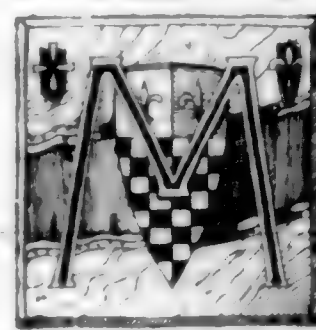
C HATEAU Chevalier Wine cellar, St. Helena, Oliver Everett, Architect.

H Dwelling, Percy & Hamilton, Architects.

INTER-OCEANIC SHIP-CANAL COMMUNICATION BY THE AMERICAN ISTHMUS.

ITS GEOGRAPHIC AND ECONOMIC RELATIONS TOWARDS THE UNITED STATES.

Portions of a paper read by N. J. MANSON before the Technical Society of the Pacific Coast, July 7th, 1883.



R. President, during the past year, I have expressed through the press some views and opinions upon the subject of inter-oceanic communication. A few of the members of your Society expressed the regret that one of my articles had not been read before this Society. In accordance with a promise made at that time I appear before you to-night asking your indulgence.

"Commerce loves the sea, but it depends for life and health on the land. It derives its sustenance from the rivers and the basins which they drain, and increases the opulence of nations in proportion to the facilities of intercourse which those nations have with the outlets of such basins.

"The three great outlets of commerce, the delta of the Mississippi, the Hudson and the Amazon, are all within 2,000 miles, ten days' sail of Darien. It is the barrier which separates us from 600 millions of people. Break it down and the Atlantic Coast of the United States and the Gulf of Mexico become the focus of the world's commerce." * *

ELEVATIONS AND WIDTHS OF THE ISTHMUS AT POSSIBLE POINTS OF TRANSIT.

The American Isthmus is for nearly its whole extent a ridge of the Cordilleras. From Tehuantepec, where it joins the expanse of North America, to the Gulf of Darien, where it joins South America, it is in length about 1,230 miles. Its width is out of all proportion to its length. It is more essentially an isthmus than any other narrow neck of land on the globe. If we will compare the mean of the widths of the Isthmus, at Tehuantepec, 143 miles; at Honduras, 161 miles; at Nicaragua, 169 miles; at Panama, 47½ miles; at San Blas, 30 miles, they will give for the breadth of the Isthmus about one-eleventh of its length. Its lowest eleva-

tions above sea level, at possible points of inter-oceanic transit, are at Tehuantepec, 754 feet; at Honduras, 2,000 to 3,000 feet; at Nicaragua, 153 feet; at Panama, 287 feet; at San Blas, 1,142 feet; at Caledonia, 1,003 feet; at the Truando-Atrato, 950 feet; at the Napipi Atrato, 778 feet; at the Tuyra-Peranchita, 808 feet. The last five routes are all so mountainous and elevated as to require tunneling from six to ten miles in length. The entire Isthmus has been called an immense causeway, separating the seas while uniting the continents. It is worthy of thoughtful consideration that while the African Isthmus, Suez, is but the center of the Old Continents, the American Isthmus is the center of the oceans.

The opening of navigation through Suez gave a short route inland for Western Europe to the east of the Old Continent. Should this nation, as a nation, open and render free a strait across Central America, we not only join the oceans embracing our country, but we open the two halves of the globe to the enterprise of our people, and there will be accomplished for the people of the United States the most ample and far-reaching achievement of civilization since the creation of the world; or, to quote Humboldt and Maury, an epoch in the history of the universe will stand distinctly marked, and it may be added, that should this channel be permitted to be opened in any other way than by a free, an enlightened, and a liberal nation, its natural guardian and custodian, the clock of the world and of civilization will be turned backward one century at least. * *

SURVEYS OF THE WHOLE ISTHMUS DIRECTLY BY THE GOVERNMENT.

The Government of the United States, realizing the full importance of an inter-oceanic canal, and acting upon the report of Rear Admiral Davis, sent into Central America its most experienced navigators and engineers, and it expended, in its surveys and explorations, according to De Lesseps, no less than \$5,000,000.—*North American Review*, Vol. 130, page 1.

A general attack, in an engineering way, upon all the possible lines of canal transit seems to have been determined upon by Congress.

I. In the first place, Congress caused an instrumental reconnaissance of the Isthmus of Tehuantepec to be made by Captain Shufeld in 1872.

II. In the same year Congress caused to be made, by Commander E. P. Lull, U. S. N., an examination, survey, and definite instrumental location of an inter-ocean canal route from the vicinity of Graytown, via Lake Nicaragua, and thence via the rivers Medio and Grande to Brito on the Pacific Coast. As supplemental to this survey some preliminary observations were made in 1872 by Commander Chester Hatfield, U. S. N.

III. It caused to be made an examination and instrumental survey of an inter-oceanic canal route from Navy Bay to Panama by Commander E. P. Lull, U. S. N., in 1875.

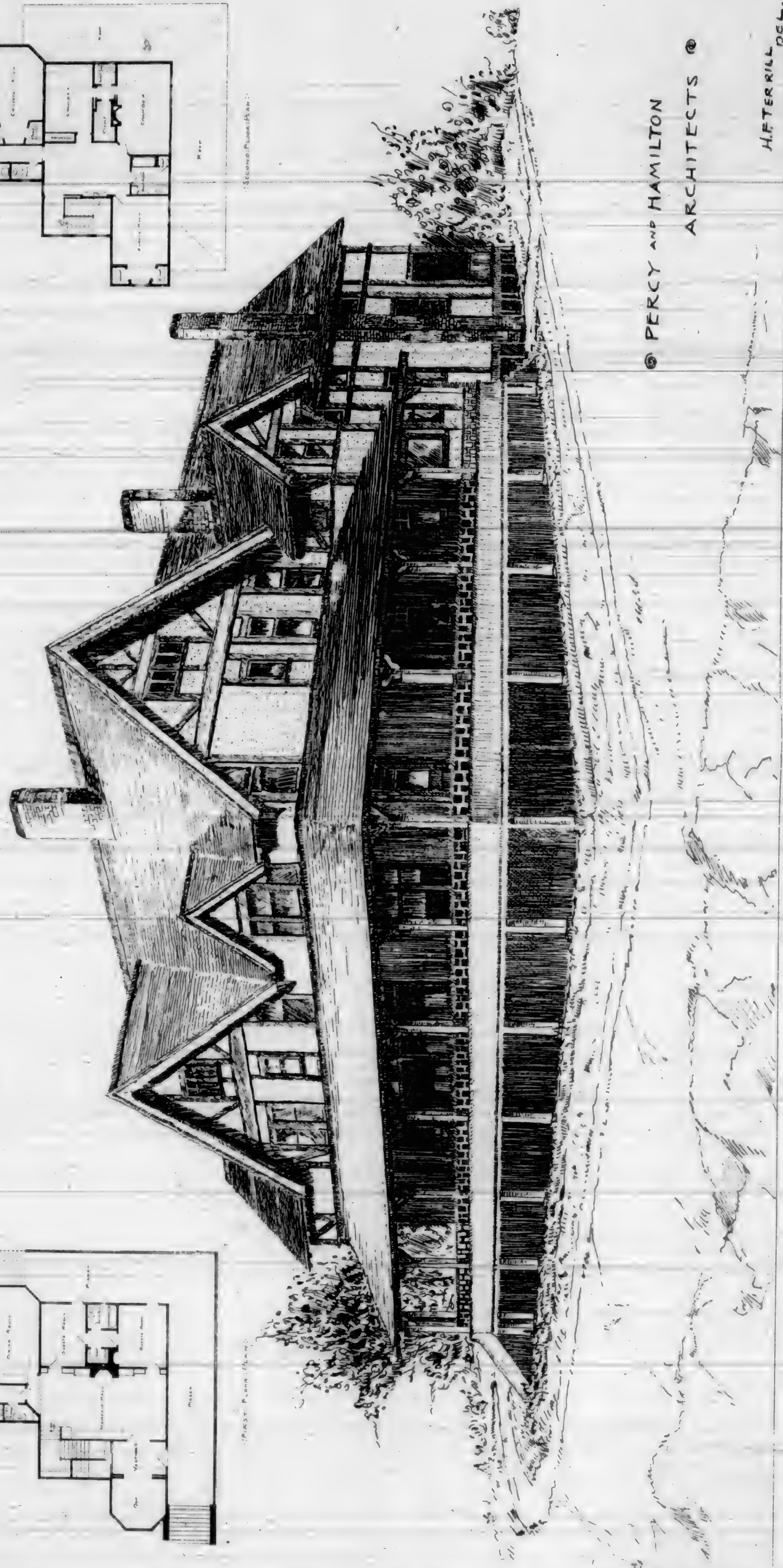
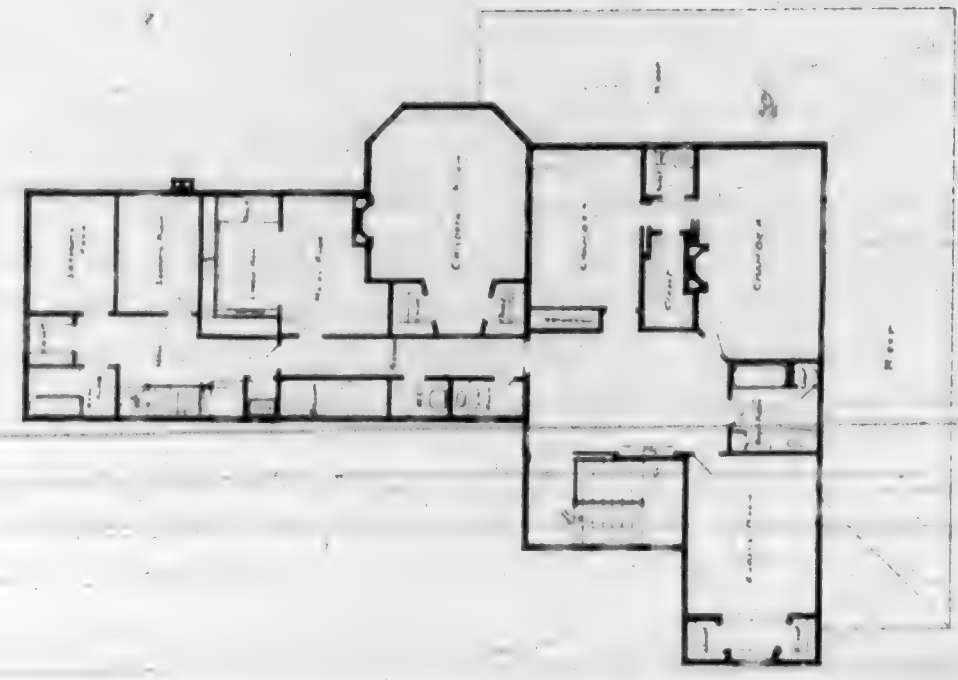
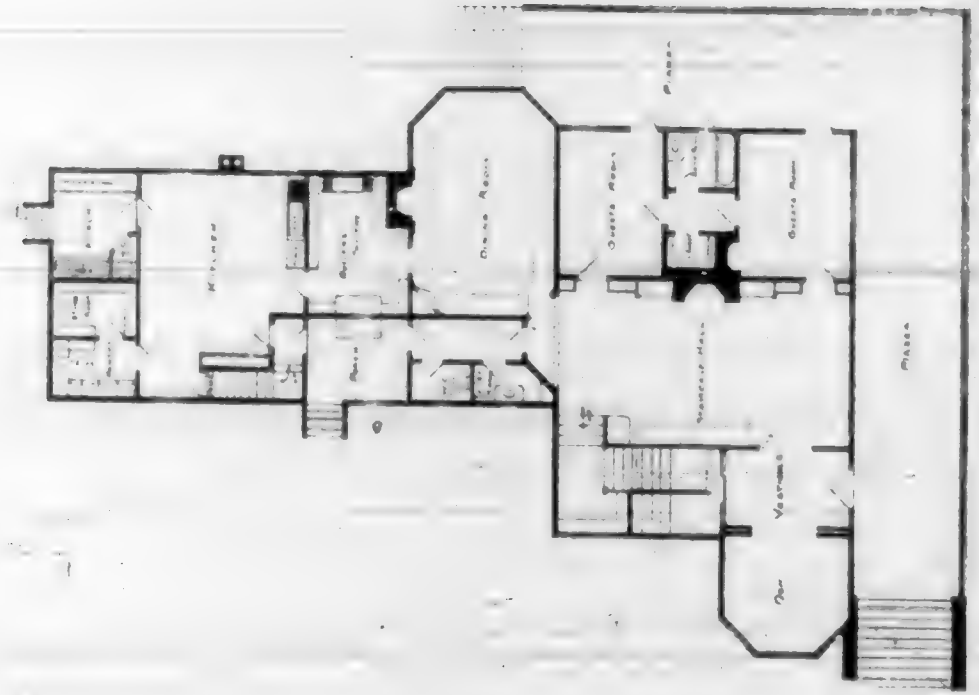
IV. It ordered and caused to be made examinations and surveys from the Gulf of San Blas toward the River Chepo by Commander T. O. Selfridge, U. S. N., in 1870, and caused reconnaissances to be made from the waters of the Chepo towards the Gulf of San Blas by Commander E. P. Lull, in 1875.

V. Under its direction several tentative instrumental surveys in the vicinity of Caledonia Bay, across the Cordilleras, were made by parties under the direction of Commander T. O. Selfridge, U. S. N., 1871.

VI. It caused a barometrical reconnaissance to be made of the "De Puydt Route" by way of the Tenala River, between the Tuyra and Atrato, by a party under the direction of Commander T. O. Selfridge, U. S. N., 1871.

VII. Tentative instrumental lines by the so-called Gorgoza route, from the east coast by way of the Atrato Caracica and Peranchita Rivers, from the west coast via the Tuyra and Cue Rivers across the divide, were made by parties under the direction of Commander T. O. Selfridge, U. S. N., 1871.

VIII. An instrumental examination was made of what is known as the Truando Route by Lieutenants Michler, U. S. A., and Craven, U. S. N., 1856-7. This survey was sup-



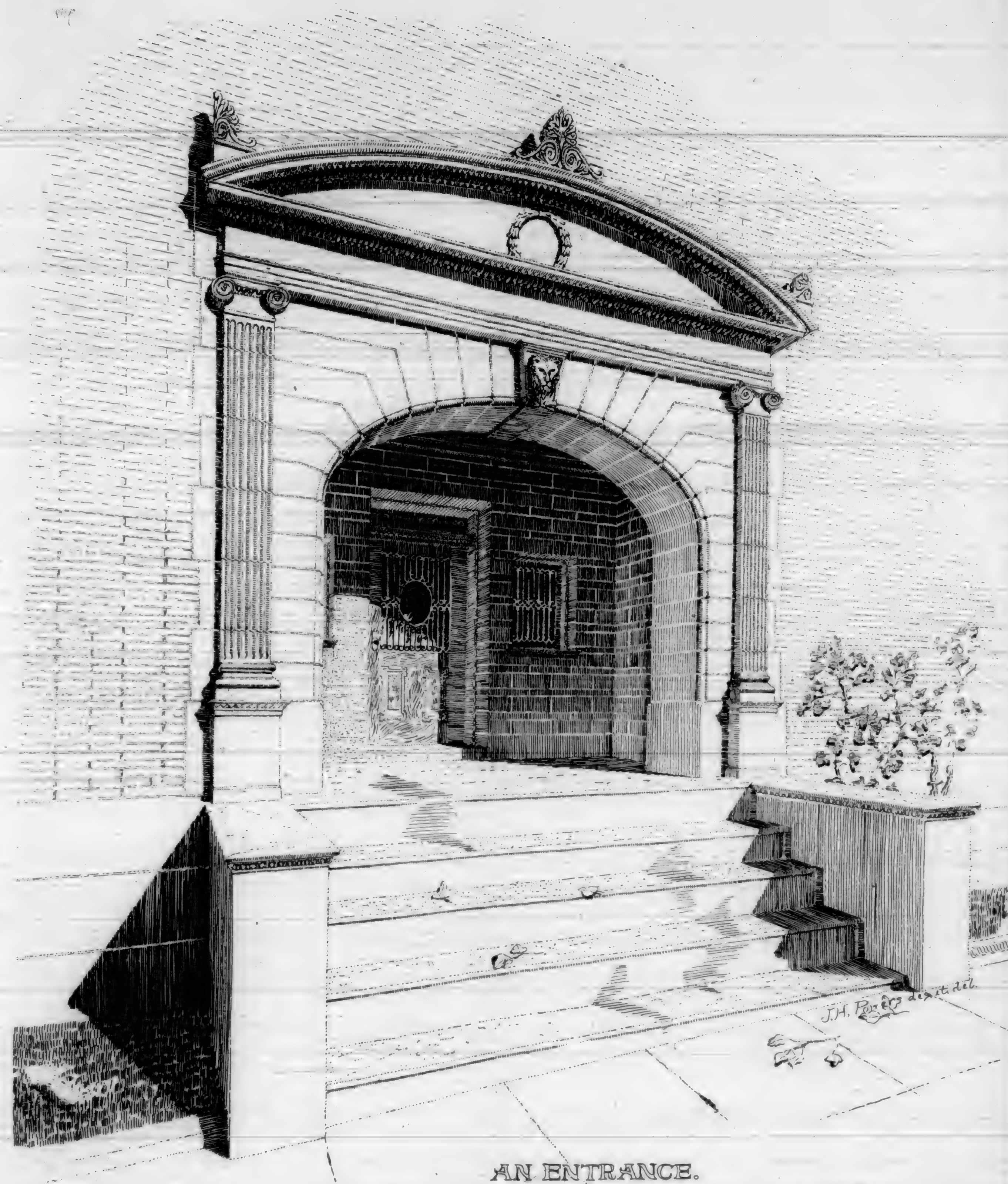
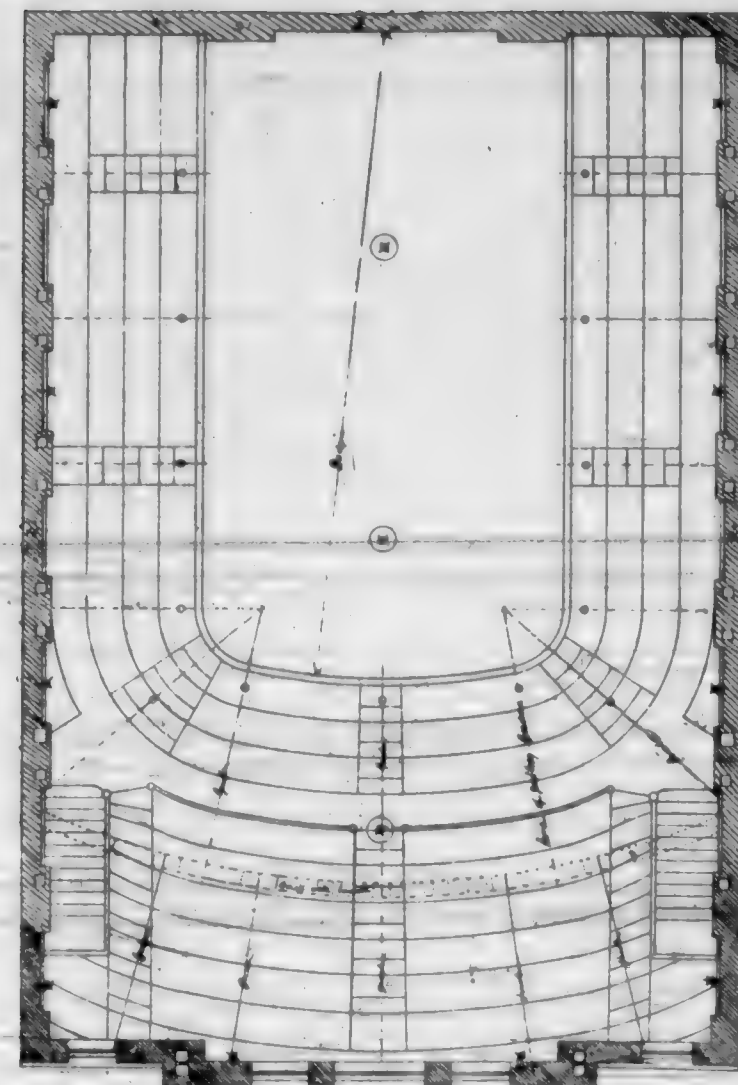
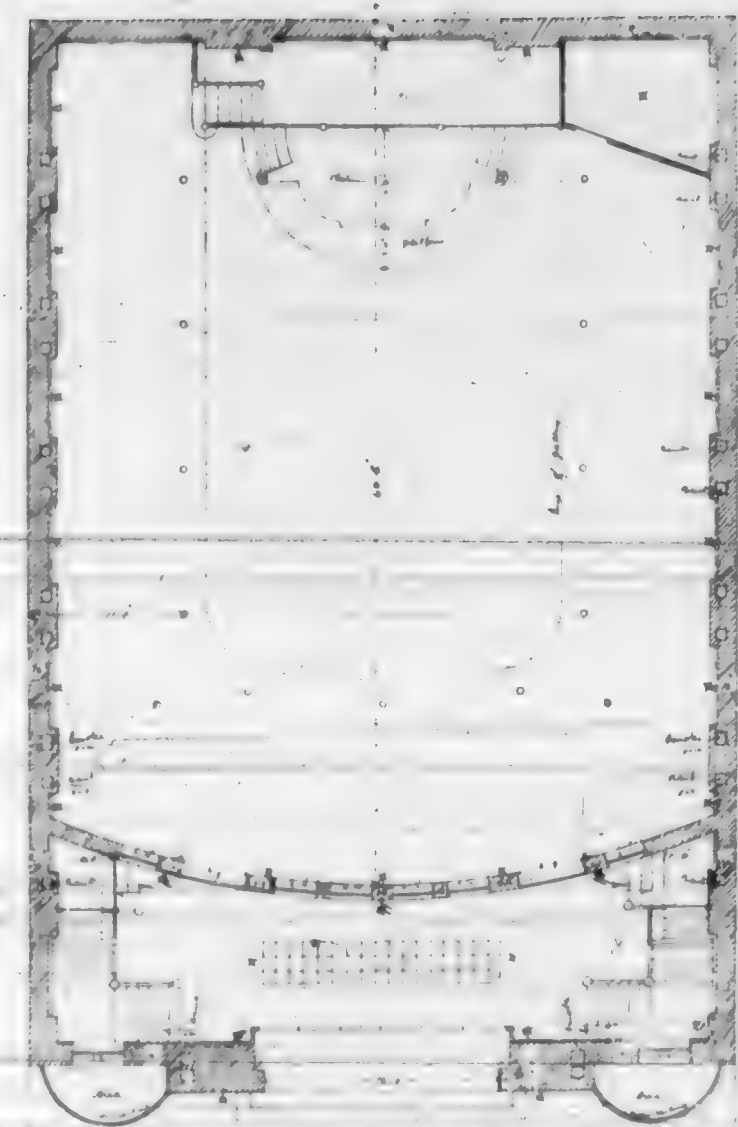
© PERCY AND HAMILTON
ARCHITECTS ©

HETERILL
DEL.

CALIFORNIA ARCHITECT & BUILDING NEWS
SAN FRANCISCO.

BRITTON & REY PHOTO LITH.

VOL. XV No 3 MARCH 1894





CHATEAU CHEVALIER MINE CELLAR. ST. HELENA, CAL. OLIVER EVERETT, ARCHTCT.

CALIFORNIA ARCHITECT & BUILDING NEWS
SAN FRANCISCO.

BRITTON & REY PHOTO LITH.

VOL. XV No 3 MARCH 1894

plemented by an instrumental reconnaissance of the Napipi and Cuia Rivers, including a reconnaissance of the Atrato River to the town of Quibdo, by parties under the direction of Commander T. O. Selfridge, U. S. N., 1871-1873.

IX. It caused a tentative examination and definite instrumental location to be made of an inter-oceanic canal by way of the Napipi and Doguado Rivers by Lieutenant Fredrick Collins, U. S. N., 1875.

X. Congress caused the work of Commander Lull, at Nicaragua, in 1872-3, to be supplemented by parties under the direction of Mr. A. G. Menocal, C. E., U. S. N., in 1880-1 and 1885-6, the nature of this Government work of Mr. Menocal being an instrumental survey and definite location of an inter-oceanic canal via Lake Nicaragua, including the location of the necessary dams, locks, etc. This later work of Mr. Menocal's being subsequent to all the Government surveys was made after the Government of the United States had determined, through what is sometimes called its high commission, that the Nicaragua Route was the most feasible of all the routes, and the survey was made with the express object of carrying out the provisions of the Zavala-Frelinghuysen treaty. (Government Construction and Ownership of the Nicaragua Canal.) The main provisions of this treaty will be adverted to later.

CRITICISMS OF THE SURVEYS OF POSSIBLE ROUTES.

It has been said of these various routes by Professor Nourse, of the United States Navy one of the very highest authorities on this subject:

I. That Tehuantepec, though possessing large natural and political advantages, requires 140 locks to overcome an elevation of 754 feet, and a feeder 27 miles in length.

II. That the Panama Line is the shortest of all the routes, not involving a tunnel. It is liable to the heaviest of tropical rains, falling in the Culebra section upon a trench nearly 500 feet in depth. It is also liable to the sudden rise of the River Chagres. The climate of Panama is notoriously a physical obstacle, which must be considered in any estimate of the advantages and disadvantages of the route. * *

III. We come now to the San Blas route. Of this route Mr. Nourse says though the shortest of all the proposed routes, the distance from tide to tide being only 19.5 miles, and although the harbors at both termini are exceptionally good, it must be eliminated from the problem of canalization by its demand for a tunnel from seven to eight miles in length.

IV. The Atrato-Napipi Route, fully surveyed by expeditions under Commander Selfridge and Lieutenant Collins, which were supplemental to the extensive surveys under Michler, Craven and Trautwine, must also be eliminated, in the opinion of Mr. Nourse, by reason chiefly of a like demand for a tunnel. The late eminent civil engineer, Trautwine, estimated the cost of a canal by this route at from \$300,000,000, to \$400,000,000. * * *

V. The Nicaragua Route. This route has, as a grand interior basin and feeder, a lake of 2,600 square miles (4½ times the area of the Bay of San Francisco). It has a healthier country, and more abundant supplies for construction, than any other route. Its supply of native labor is large; it is better than that of any other route. In works of magnitude in tropical countries this is a most important consideration. Except the Tehuantepec route, it is nearer by 700 miles to the United States and its commerce. Its termini lie without the equatorial belt of calms, and if those termini can be built up and restored they will be easily accessible to sailing vessels. * * *

It has been my purpose to lay before the Society the main features of the various Isthmian routes so that it may be able to form a general judgment of the comparative merits of all. I have dwelt at no great length upon the merits of the Panama Route, nor at all upon the merits of the Eads ship railway at Tehuantepec. They may both be practicable and highly meritorious plans, but I do not consider it necessary at this time to farther occupy the time of the Society with these possible undertakings.

I will state, generally, however, in the language of Professor Nourse, in order to enable the Society to form its opinions, that: "To meet the requirements which commerce,

supported by all the advanced appliances of this day imperatively demands, the transit must offer the allurements of a full, uninterrupted, safe and speedy transportation. It must be a water highway, through which the largest sea-going vessels, with a tonnage of even 6,000 or more, may pass without breaking bulk; and, it must be remembered, that all experience proves the justice of the statement that railways and canals are supported by the carriage of different species of merchandise—products of great value and small bulk voluntarily selecting the more rapid channel of the railway, while others choose the maritime route." *

CONSTITUTIONAL POWER OF THE GOVERNMENT TO CONSTRUCT AND OWN AN INTER-OCEANIC CANAL.

At this date it is hardly necessary to remind you that the Government of the United States would have the full constitutional power to construct and own the Nicaragua Canal, and operate it in the interest of its people, in the same way that it has improved the Mississippi and the Great Lakes. Indeed, the very convention which framed the Constitution of the United States, by a vote of eight to three, denied the power to the General Government to grant a charter to a private corporation for the purpose of cutting canals in cases in which the authority of a single State would be insufficient (Madison Papers, 1576.) And the same reference will show that it was the intention of the framers of the Constitution to grant the power to the General Government to do directly for the people that class of work.

The direct improvement by the Government of the harbor of Pago Pago, in the Samoan Islands, and Pearl Harbor, in the Hawaiian Islands; the purchase known as the Louisiana purchase, of Florida, and of Alaska, all furnish ample precedent for the direct action of the Government itself at the Nicaragua Route, either by purchase or under treaty with the Nicaraguan Government.

At one time there were a few who thought the General Government would become too powerful or too corrupt if it directly undertook matters of internal improvement. To those I wish to say that they are repeating the arguments of the private speculators. Your Government has become infinitely more corrupt through going into partnership with private corporations, and vastly more injurious and oppressive to the great body of the people from this single circumstance, than from all others combined. If Government legislators were not allowed to sell everything in sight under the name of a Federal franchise, and pocket the proceeds, the body of the American people would have vastly more than they have at present, and an era of congested wealth in the hands of a few would not be upon us.

THE DEMAND IS UNIVERSAL THAT WE RETURN TO SOUND PRINCIPLES OF GOVERNMENT.

When the several States composing the United States surrendered to the General Government the power "to coin money and regulate the value thereof" (Const. U. S., Art. I, Sec. 8); and to issue its treasury notes and greenbacks (the construction put upon the power by the Supreme Court); and in addition thereto denied to themselves the power "to coin Money; emit Bill of Credit; make any Thing but gold and silver Coin a Tender in Payment of Debts" (Const. U. S., Art. I, Sec. 10); and denied to themselves the further power to raise a revenue by duties on imports—indirect taxation—(Const. U. S., Art. I, Sec. 10); and when they granted this power to the General Government (Art. I, Sec. 8), the several States *did*, under the Constitution, effectively surrender the PURSE to the General Government. Since, then, the General Government confessedly and effectively holds the public purse, the law-abiding people of the United States must naturally and of right look to it for all necessary internal improvements for the general welfare. The several States, as we have seen, cannot *directly* construct these works, for they placed the means, their purses, in the hands of the General Government.

The purpose of this grant of the purse to the General Government is, *amongst* other things, that Congress shall have power "to establish postoffices and postroads" (Const. U. S., Art. I, Sec. 8). "Congress shall have power to regulate commerce among the several States"—*Id.* The purse