

THE
ARCHITECT &
ENGINEER
OF CALIFORNIA.

VOL.
IX

No. 1

ENGINEERING FEATURES OF OLYMPIC CLUB'S NEW
BUILDING

By HENRY A. SCHULZKY, Architect

THE STEEL FRAME AND ITS PART IN THE REBUILDING
OF SAN FRANCISCO

THE RECONSTRUCTION OF SAN FRANCISCO

By WILLIAM HAM. HALL, C.E.

THE USE OF CONCRETE FOR COTTAGE BUILDING

By DAVID L. LAY

DOMESTIC GAS LIGHTING FROM THE FIXTURE MAN'S
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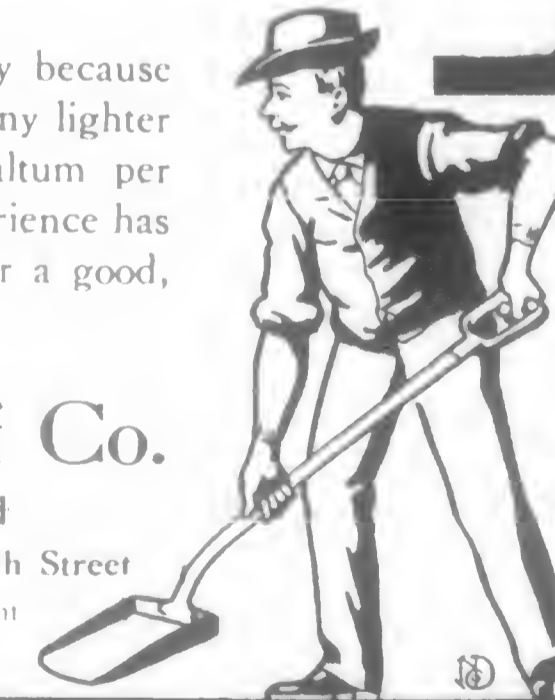
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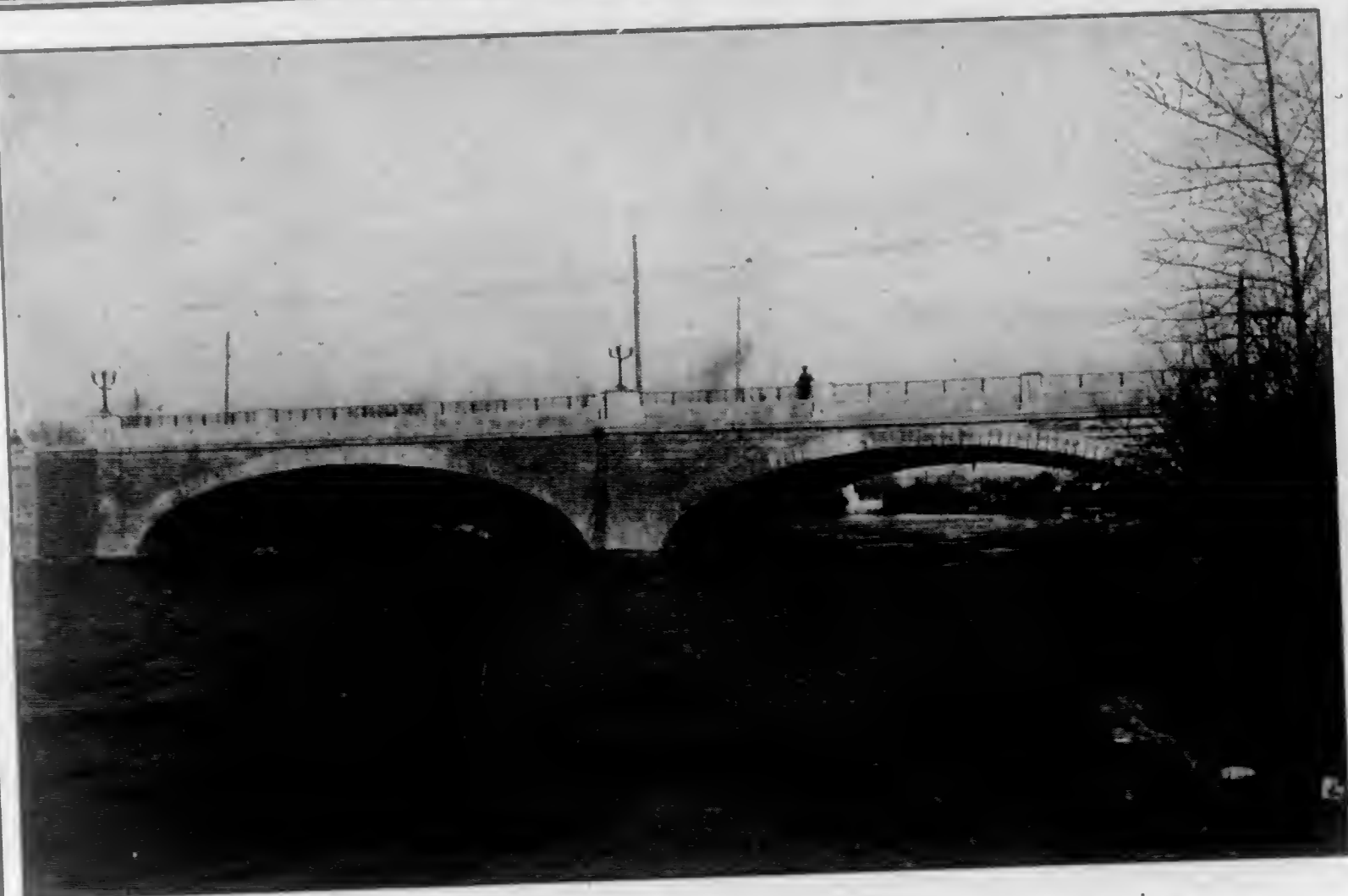
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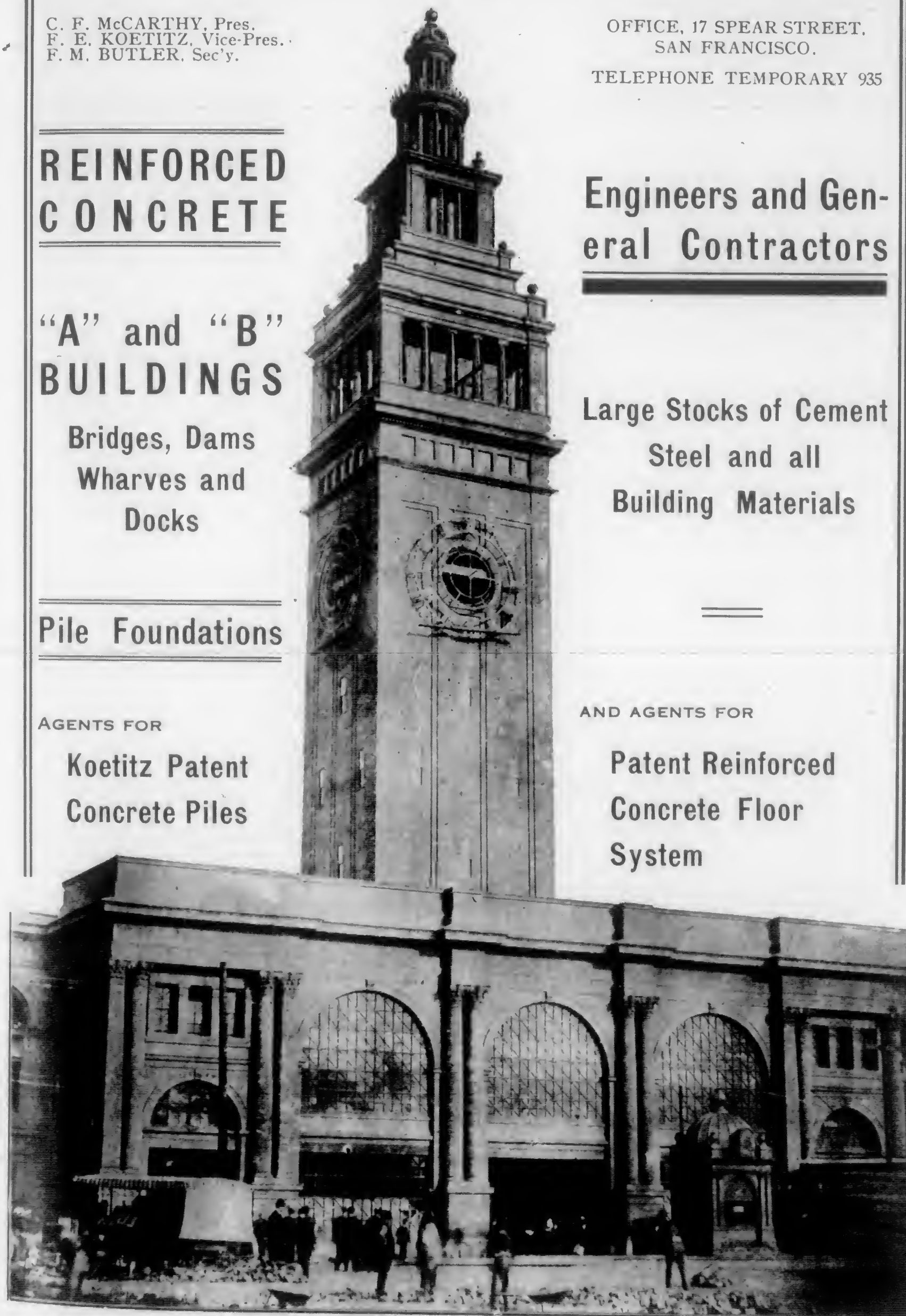
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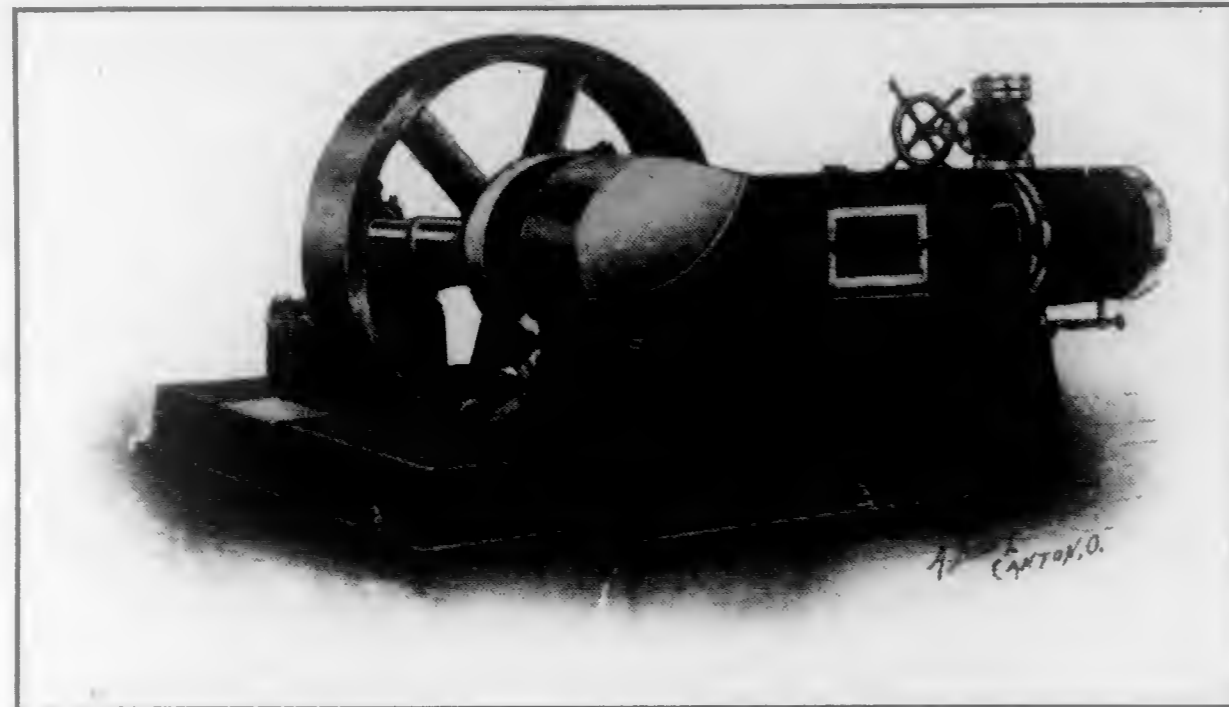


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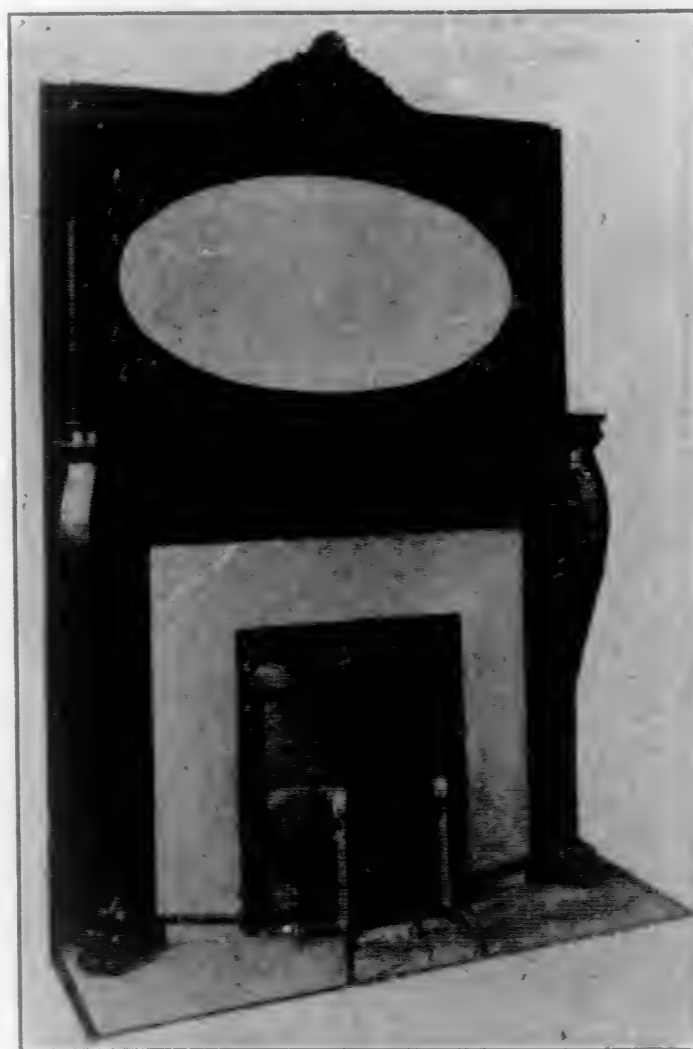
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Is the Best Finish
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Not brittle, will neither scratch nor de-
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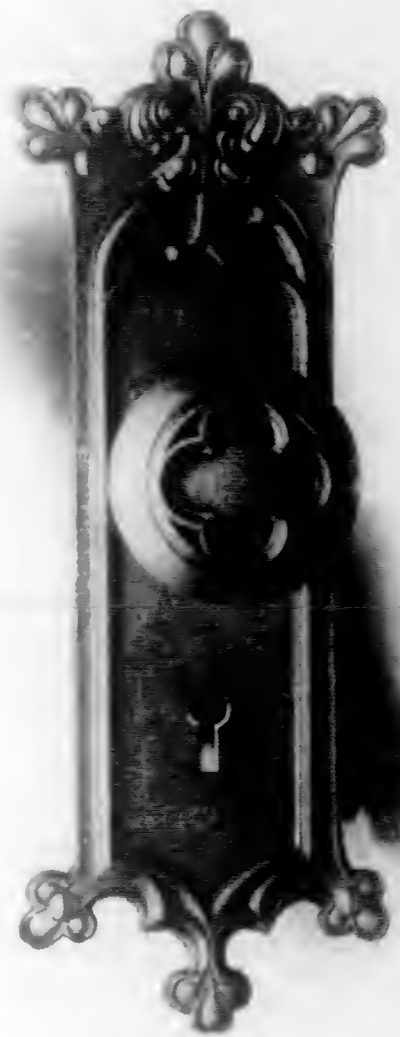
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**STEEL AND REINFORCED CONCRETE
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Can there be any stronger evidence of its worth to any engineer or architect who desires to specify and use the best waterproofing—which gives results and stands the test when the test comes?

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are used exclusively in the reinforcement of this bridge

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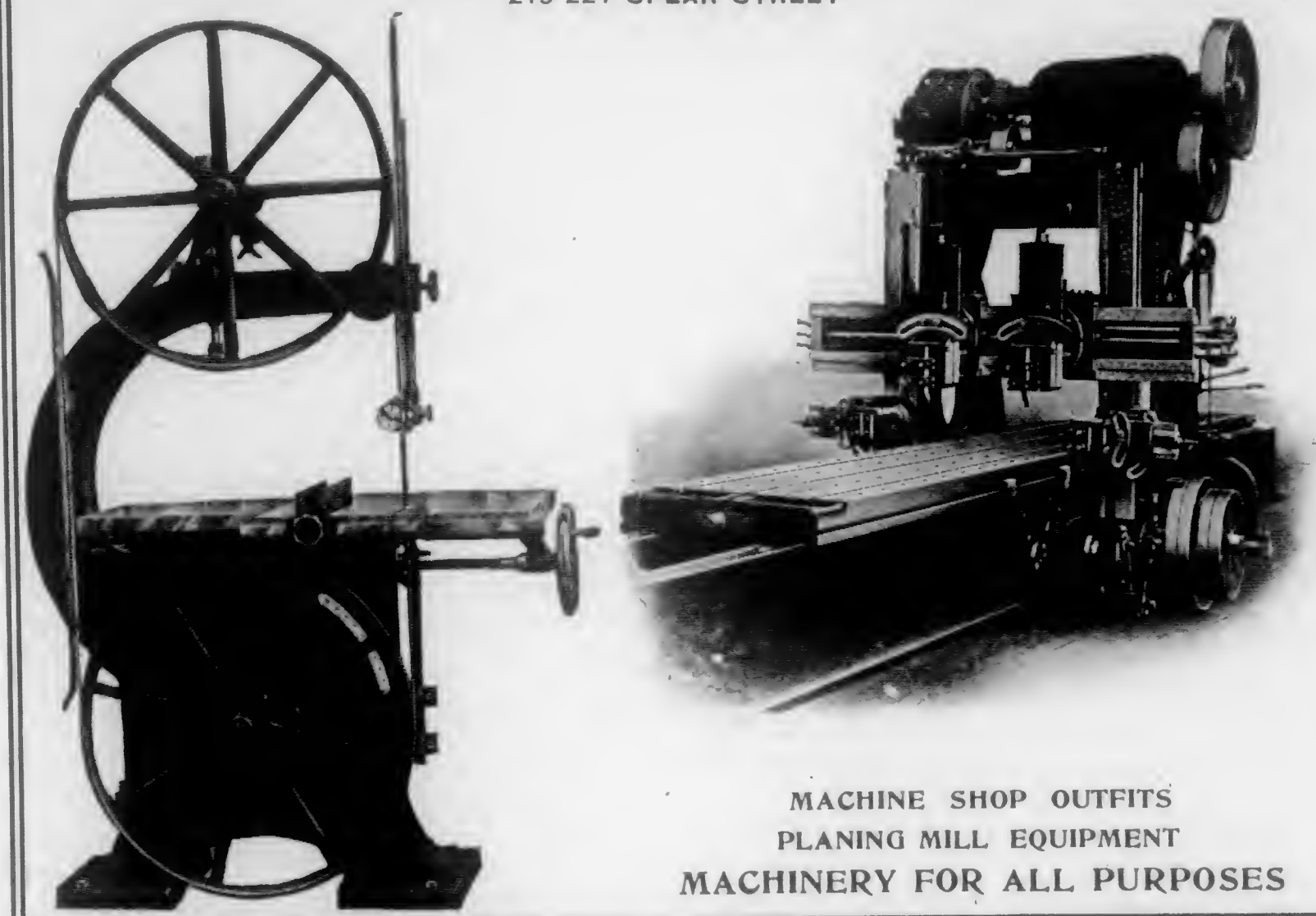
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American System of Concrete Reinforcing

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For
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Variety of Constructions
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Can Give a Span of 100 Feet Without a Single Upright

Are specially adapted for

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Estimates Cheerfully Given

Give size of building over all



PRICES LESS THAN ORDINARY ROOF.

We have on hand 20 carloads of

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The best and most reliable roofing on the market. Compare our quality with that of the other fellow.

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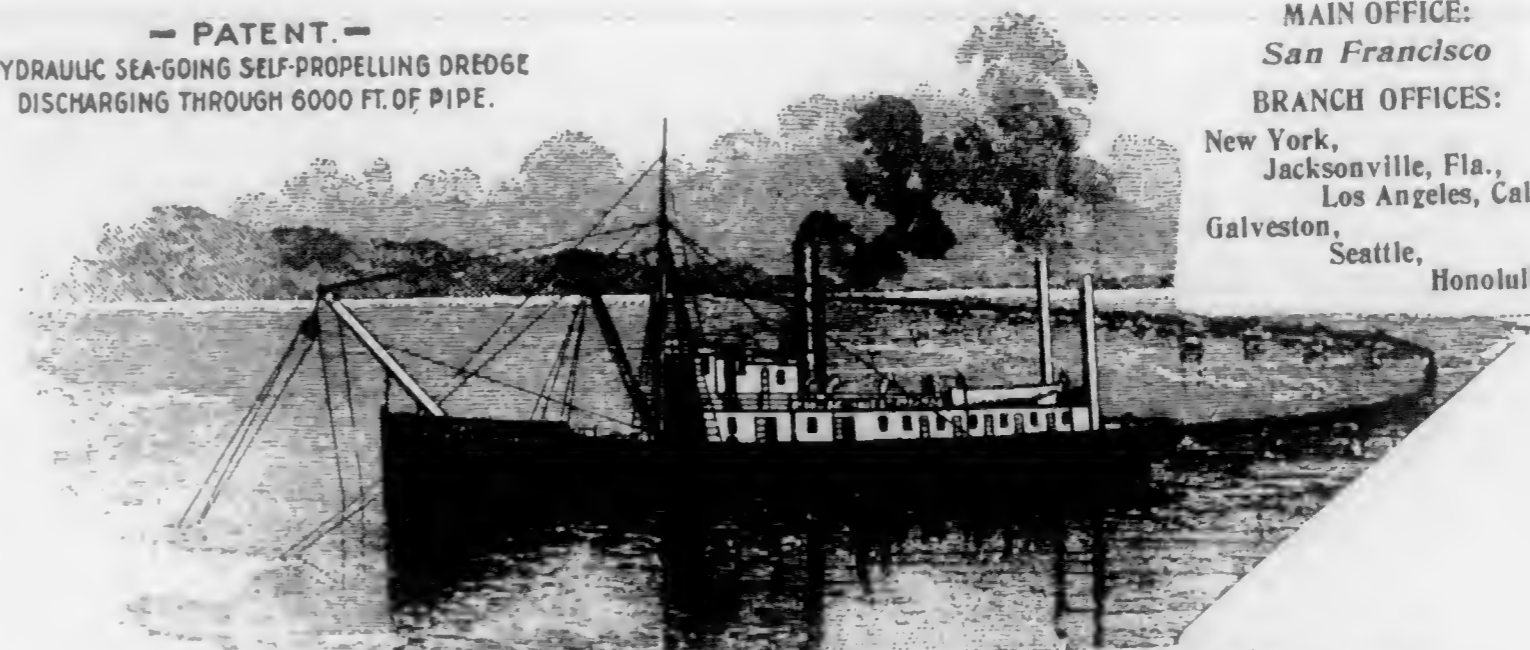
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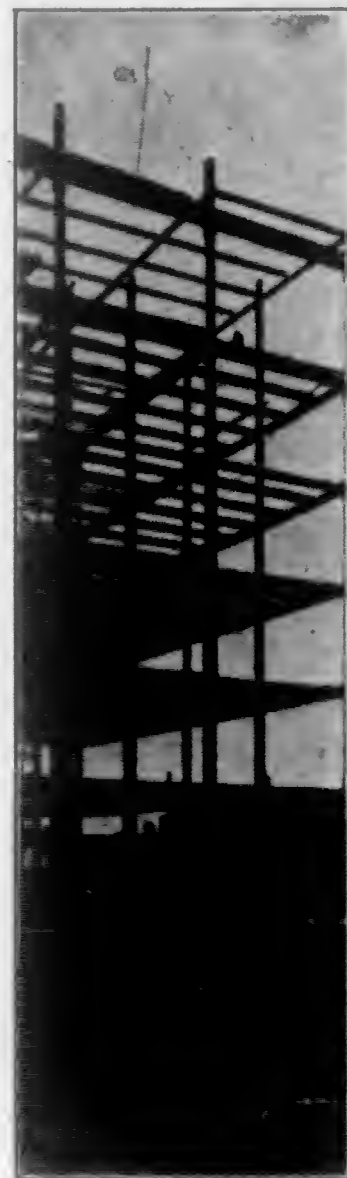
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For
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*Architectural and
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Work of All Des-
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We are prepared to figure any Big Steel Job in San Francisco and Guarantee Quick Shipment.

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Always Ready
Easily Operated

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Voigtmann's Fire-Proof Windows

Have withstood the Baltimore, Rochester and Toronto fires. They look better, wear better (absolutely fireproof) and are no more costly than wood. The only absolute window protection on the market. Get particulars from

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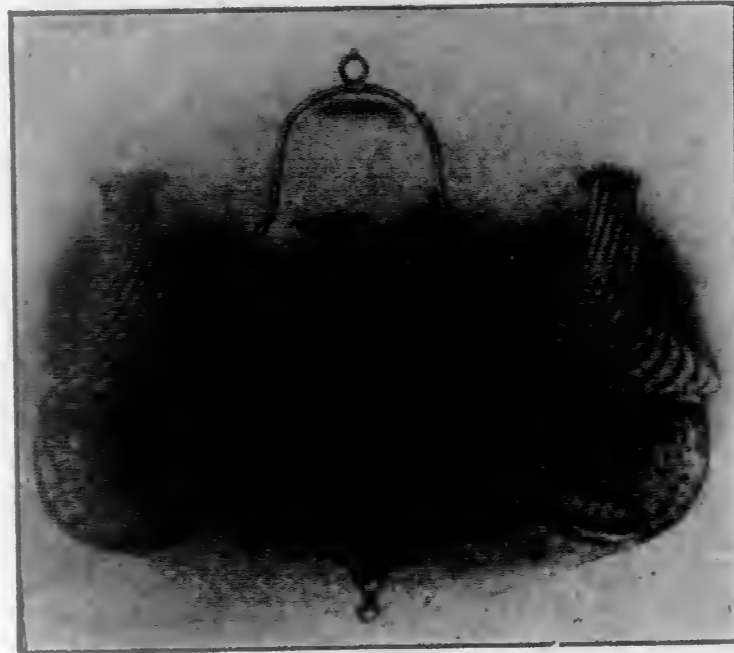
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ANGLE LAMPS

NO SMOKE NO ODOR LITTLE HEAT
COSTS LESS TO BURN THAN AN ORDINARY LAMP

As easy to operate as gas or electricity—
and better than either.
Lighted and extinguished like gas.
Can be burned high or low without a
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Send for catalogue or drop a postal
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and only one way to get best results from the use of

PRISM GLASS

and that way is to specify Luxfer Prisms to be installed
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Also Bath-room Fittings, Electrical Supplies,
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*The New Olympic Club Building, San Francisco
Henry A. Schulze, Architect*

Frontispiece, *The Architect and Engineer
of California*, May, 1907.

THE Architect and Engineer Of California

VOL. IX.

MAY, 1907.

No. 1.

Some Interesting Features of the New Olympic Club Building.

By HENRY A. SCHULZE, Architect

FROM an engineering view point the classic new home of the Olympic Club of San Francisco, presents some interesting features. The new building is being built on the old site on the northerly line of Post street between Mason and Taylor streets. The former building had a frontage on Post street of $137\frac{1}{2}$ feet; the new building is to have a frontage on that street of 170 feet and a depth of $137\frac{1}{2}$ feet, the entire lot being covered by the new building. The structure will ultimately be twelve stories high above the sidewalk but at the present only six stories above the sidewalk are contemplated.

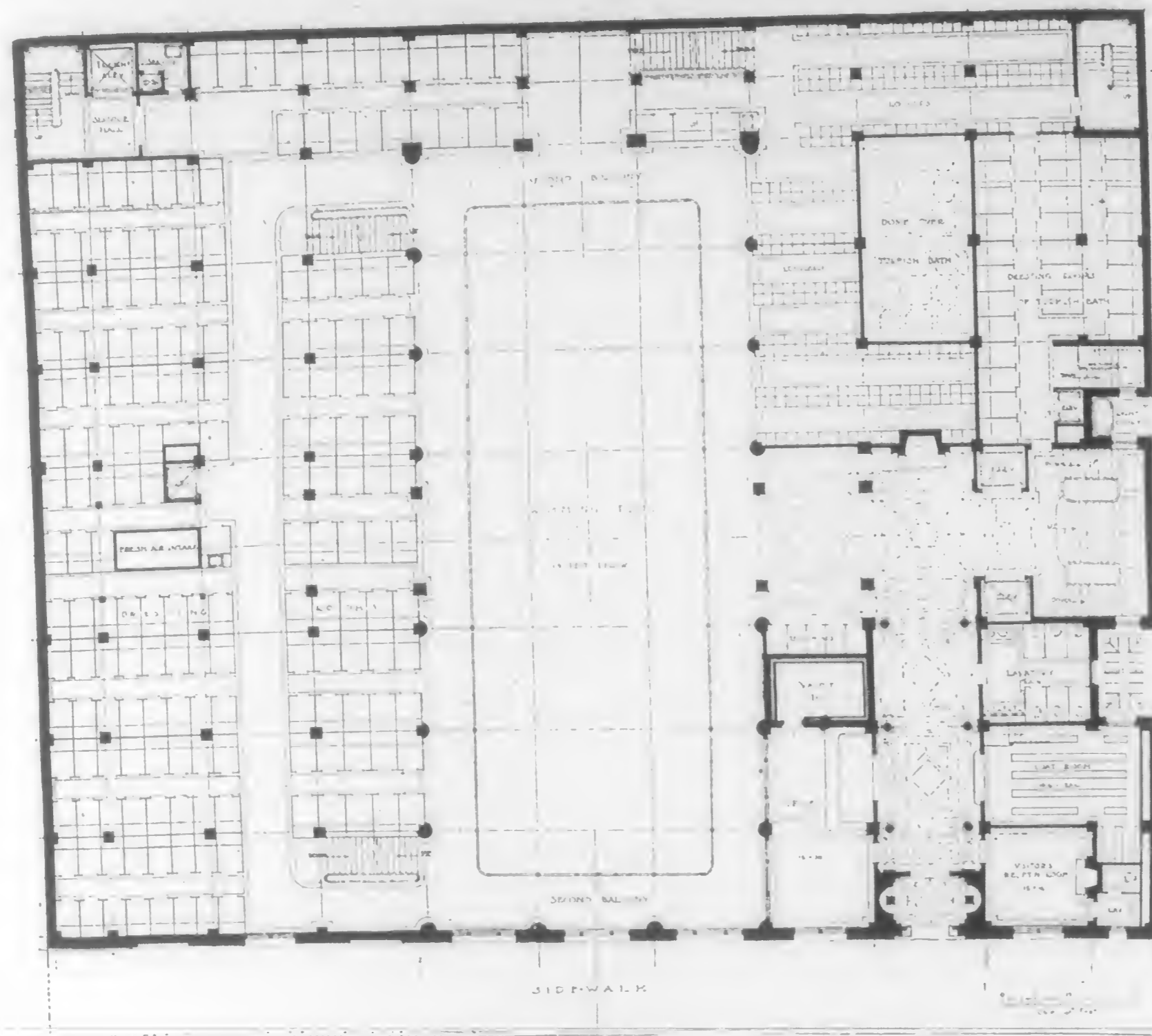
Since the first day of January the excavations and foundations for the twelve-story building have been under way. As there are practically three full stories under the sidewalk level reaching a depth at one point of fifty-two feet an excavated pit has resulted—the deepest of any heretofore undertaken in San Francisco and not many to equal it in any other portion of the United States.

The building is to be of the Class A type of steel frame throughout with reinforced concrete floors and walls of the most approved type of construction embodying the latest structural methods, the combination of which will make this building one of the strongest and safest in the city and capable of resisting the severest stresses that can be imposed upon it.

The exterior will be of the Italian Renaissance style of architecture with a recessed court 48 feet by 96 feet in size, projecting or intruding in from the street above the second story. As the exposure is to the south, light, air and sunshine are ensured to all parts of the building, even to the swimming pool located in the basement at its lowest level.

The first story will be faced with heavily rusticated white granite and above this level will be white glazed terra cotta, sand blasted to a soft velvety surface, the roof being covered with red terra cotta tiles, resulting in a completed exterior of a soft whiteness particularly adapted to our California atmosphere. The roof will be crowned with two bell-towers from which will peal forth at noon of each day the national anthem. The main entrance is located at that section of the building nearest Mason street.

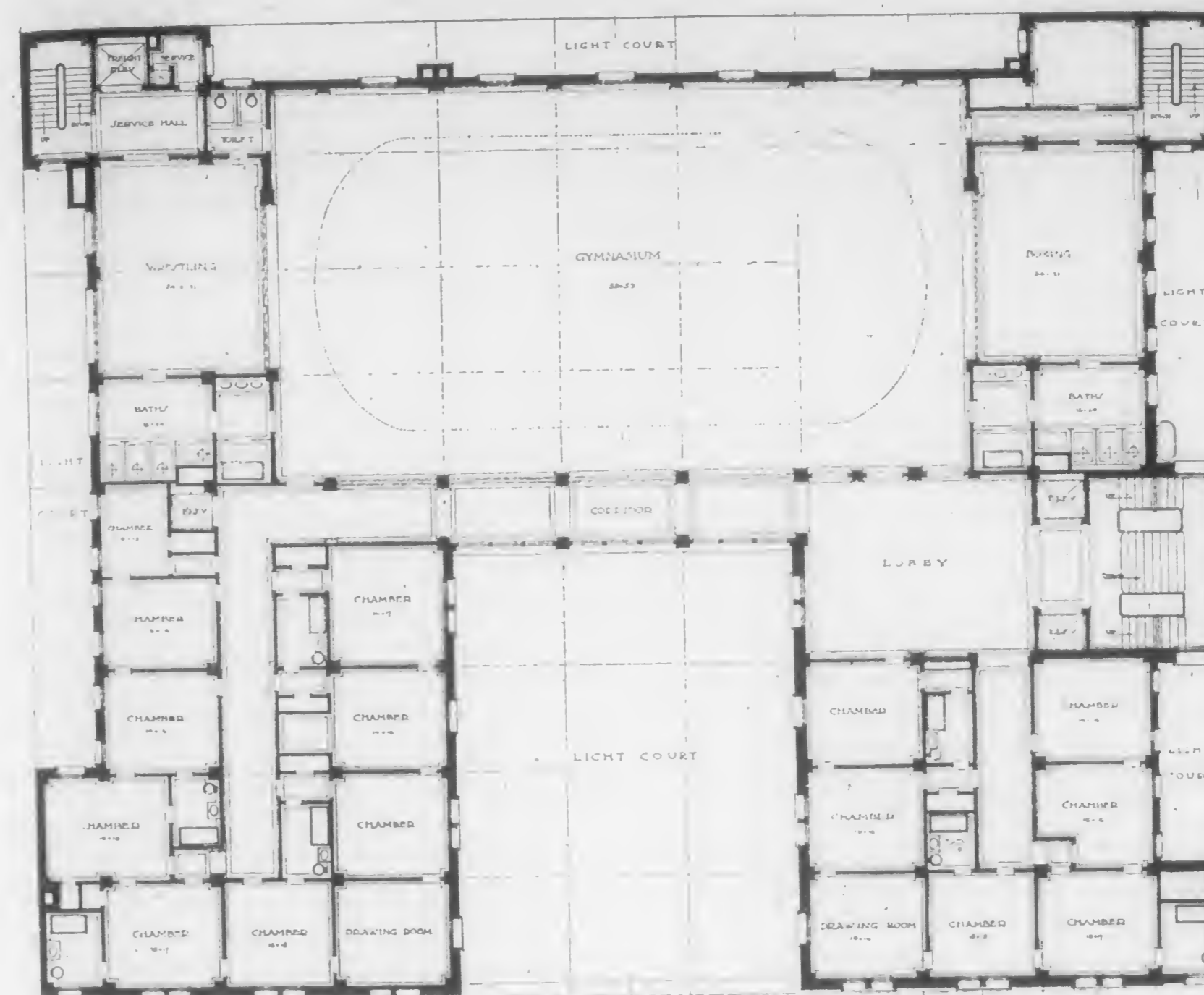
The first story including the levels below the sidewalk is devoted entirely to the uses of the main swimming pool, dressing and locker rooms, lockers, Turkish bath, shower and bath rooms and necessary adjuncts; in



Plan of the Swimming Pool and Balcony Floor. Olympic Club Building
Henry A. Schulze, Architect

the second story are located the rooms devoted to the social life of the club above which each story is divided into suites of rooms arranged after the most approved hotel system. At the northerly half of the building is located the gymnasium occupying the fifth, sixth and seventh stories, over which are located five hand-ball courts, one of which is of official size.

In order that the social life of the club should not be too far removed above the main entrance and that also the swimming and bathing facilities should be as convenient as possible to this same entrance, vast areas being required for these features in a club of so large a membership as that of the Olympic, it became necessary to take the sidewalk as the horizontal dividing line and work up and down therefrom; every portion of the three levels below the sidewalk is devoted to the salt-water swimming pool, 35 feet wide, 100 feet long and 10 feet deep, with locker and dressing rooms, Turkish bath, shower and bath rooms adjacent, the swimming pool forming a central court to this arrangement, four stories high and open to the outside air on which the locker rooms abut in such a way that they receive at all times fresh outside air and ventilation, in addition to which a forced or blast system of ventilation will ensure a cool and fresh atmosphere in the remotest sections of these lower stories. All shower and bath rooms are piped for fresh and salt water. The service entrance is on the westerly end of the building. The arrangements for sanitation will be complete and perfect, a special tunnel being run



Plan of the Gymnasium Floor. Olympic Club Building
Henry A. Schulze, Architect

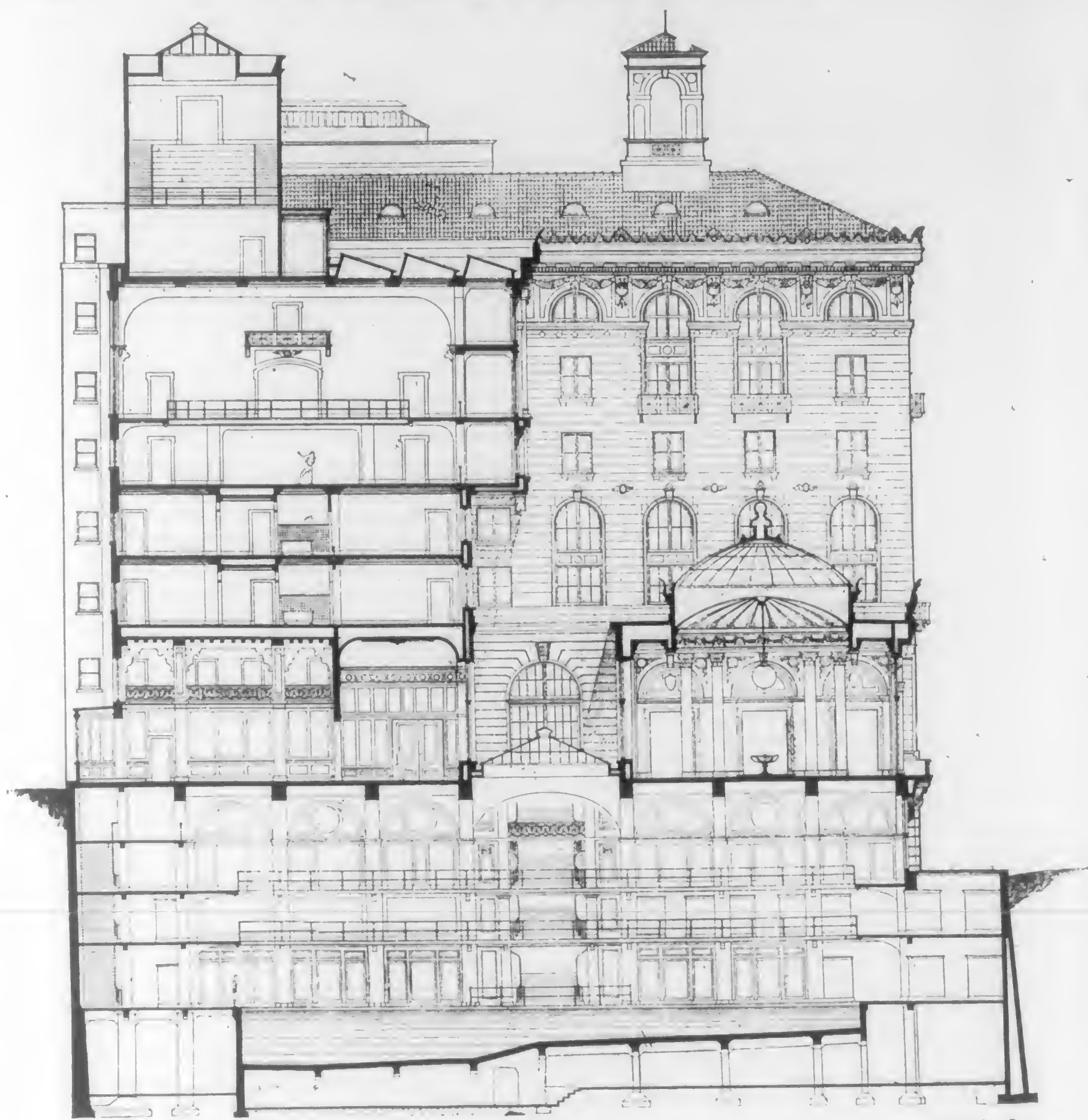
down Post street for over two blocks to connect directly with the main street sewer. Pumping will thus be avoided from the lowest levels of the building.

The social life of the club is to be located in the second story, this entire floor being divided for this purpose into a dining room 56 feet by 69 feet, palm room 44 feet by 48 feet, library 29 feet by 54 feet, social hall 40 feet by 47 feet, billiard room 34 feet by 50 feet, banquet room 19 feet by 49 feet, and adjuncts of card rooms, telephones, etc.

All comforts and conveniences will be perfect in their appointments, no hotel being equipped with more modern features than will be found here. Ice water will be on tap everywhere and in winter the heat and ventilation will be automatically regulated throughout by means of thermostats. The elevator service will be ample and of the finest degree, the interior decorations and finish will be unsurpassed, particularly the Turkish bath where Oriental effects will predominate. This feature of the club building will be specially attractive in amplitude and appointments.

The six stories at present contemplated will involve an expenditure of \$750,000 and the completed building of twelve stories will necessitate an outlay of about \$1,000,000.

The swimming pool is now nearly completed. On the first day of July it will be filled with warm salt water, a temporary building will enclose the pool and the members will thereafter have the opportunity to take the usual swim during the hot dusty months of the summer, or a Turkish bath, as may be their desire.



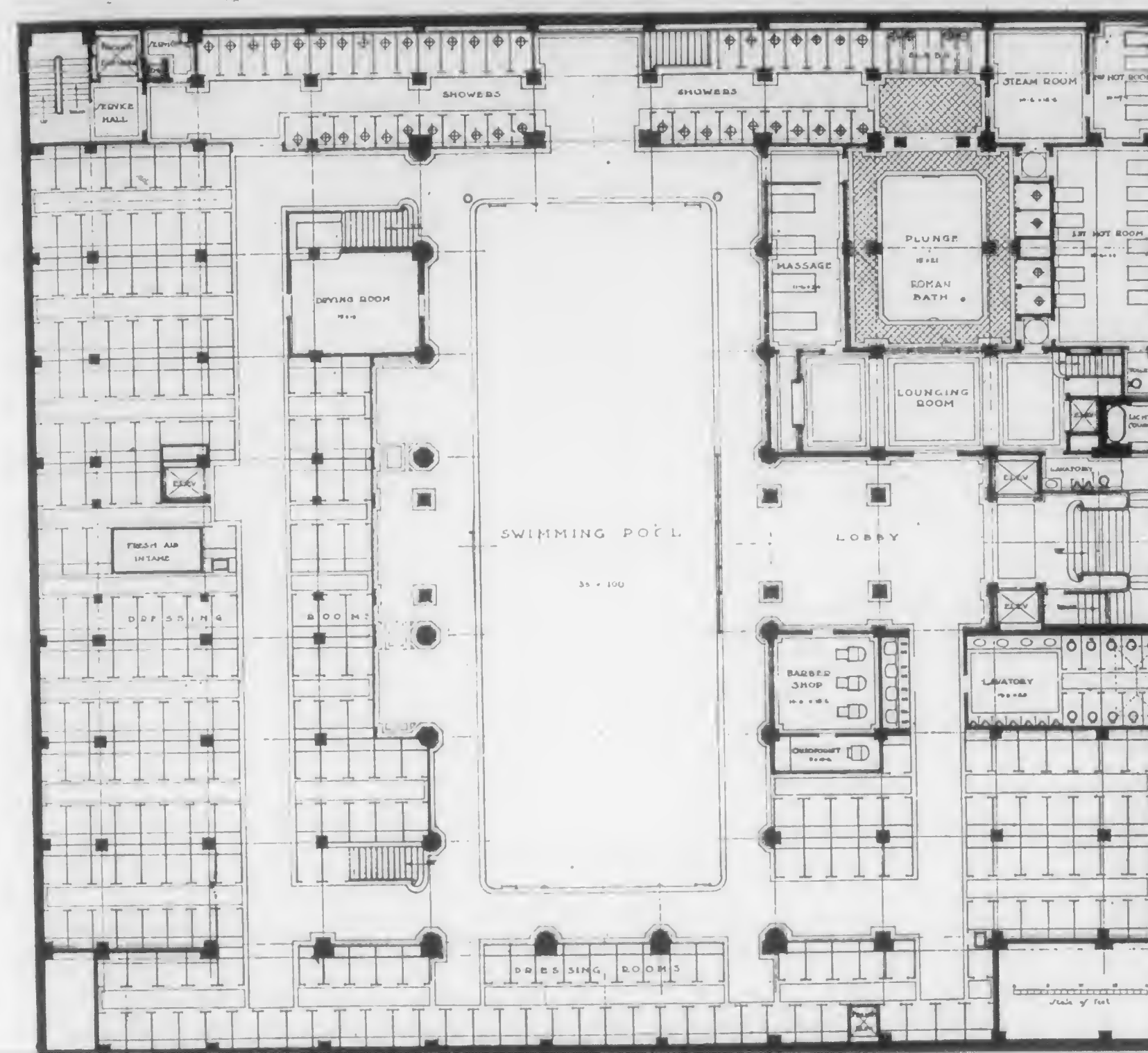
Side Elevation, Olympic Club Building, Showing Three Stories Below Street Level
Henry A. Schulze, Architect

San Francisco Architectural Club

By CARL E. ROESCH

THE official occupation of the San Francisco Architectural Club's new quarters was auspiciously celebrated on April 20th with what was considered one of the most attractive and interesting affairs ever given by the club. A varied program was presented for the amusement of those assembled, consisting of two separate sketches put on by those members who compose the theatrical branch of the organization. In addition to this an attractive vaudeville bill was rendered, the character of the evening's amusement proving that theatrical, as well as architectural ability, exists among those forming the personnel of the club.

A souvenir program of the affair occasioned much favorable comment, the advertisements being particularly amusing, as they played upon the personal characteristics of different club members, who have recently



Plan of the Swimming Pool Floor, Olympic Club Building
Henry A. Schulze, Architect

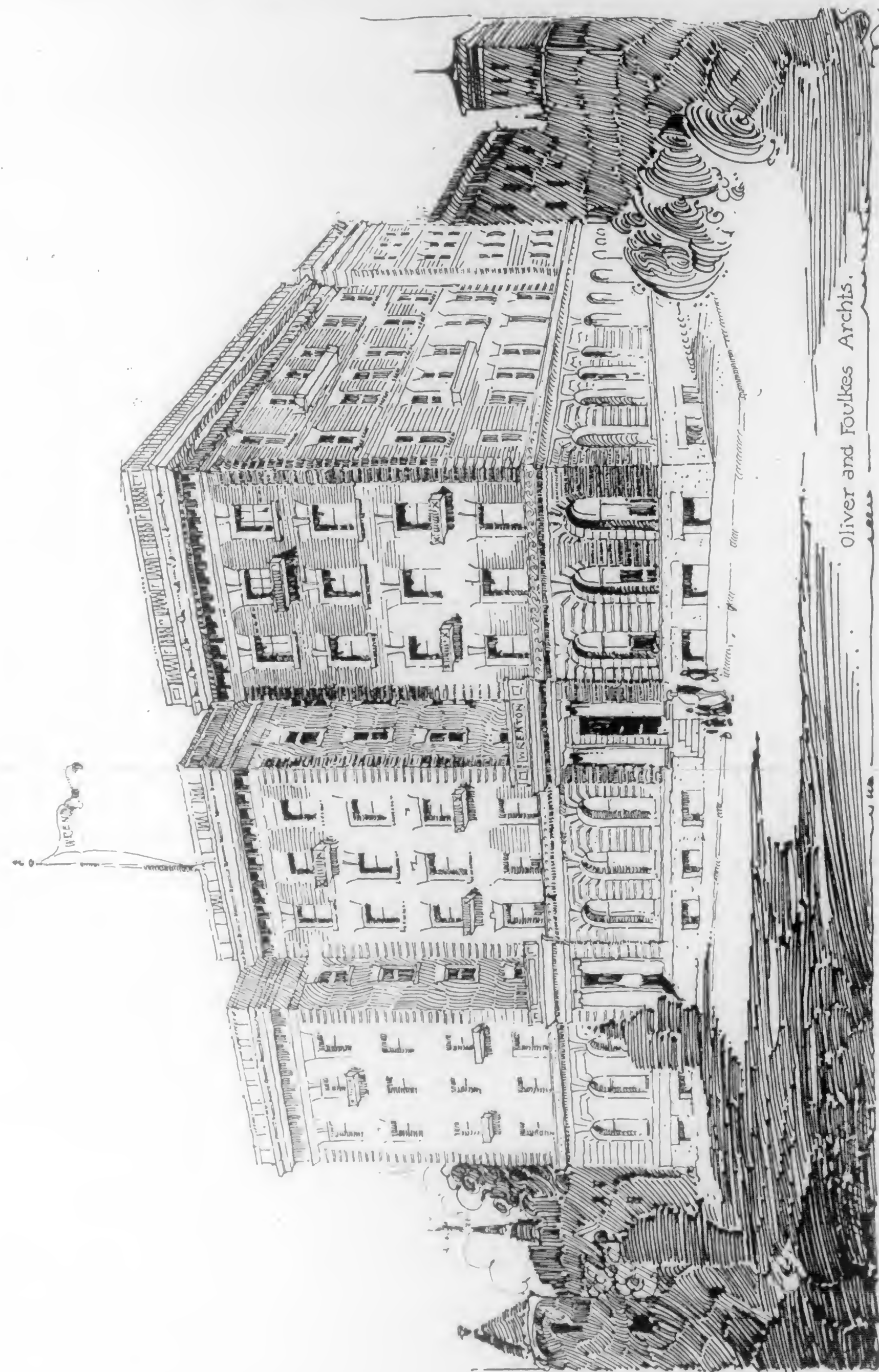
entered business for themselves. The cover design by C. A. Neubauer of the club showed much originality and was effectively rendered.

At the regular monthly business meeting various subjects of importance were presented for discussion, particularly the advisability of incorporation. Realizing the standing which such incorporation would give the club the suggestion was received with hearty approval and was favorably acted upon. This, together with membership in the Architectural League of America, the parent body with which most of the clubs are affiliated, places the local organization on a plane with the best clubs in America.

Unusual interest has been shown in the life and sketches conducted by Instructor Sewell, a man of marked ability, and a particular aptness for imparting knowledge to others. This is apparent by the improvement shown in each succeeding lesson in the sketches produced.

The advisability of holding an exhibition met with favor, and committees toward that end were appointed. It is the intention to make this a general exhibition showing the work of the architects in the various coast cities and if possible have the drawings shown at the annual exhibit of the A. L. A. brought to the coast.

The Los Angeles Club will hold their exhibit May 20th, and their drawings will be secured if possible, as well as sketches from the Portland Club, and Sketch Club of Salt Lake City, Utah. These, with the work of our local architects, should make a decidedly interesting exhibition.



Oliver and Foulkes Archts.

Family Hotel, San Francisco, for the Mary A. Gaffney Estate Oliver & Foulkes Architects



Citizen's Bank, Alameda. Constructed of Reinforced Concrete. Oliver & Foulkes, Architects

An Apartment House with Plenty of Light

By EDWARD T. FOULKES, Architect

IN NO other city in the United States does direct sunlight play so important a part in the planning of a hotel as in San Francisco, where sunshine can be enjoyed in the rooms every month of the year. This requirement, together with the desire to get the maximum number of rooms with a possible outlook upon the streets, determined the typical floor plan of the new family hotel to be erected by the Mary A. Gaffney Estate at the northwest corner of Sutter and Taylor streets.

There are forty-five rooms, of good size, on each floor, together with a serving room, linen room, public bath, etc. The rooms and baths are so arranged that suite combinations are easily made possible.

The first floor is given over entirely to hotel purposes—namely the spacious lobby, the main dining room with ten private dining rooms, children's dining room, a large ball room, a Japanese tea garden, et cetera.

The exterior will be of red brick laid with white mortar joints and with white marble trimmings after the brick colonial style of architecture in which color adds so much to its charm. The interiors will likewise be of simple colonial style in the main rooms, dependence being placed upon good materials carefully executed for effects rather than elaboration.

The Reconstruction of San Francisco

By WM. HAM HALL, C. E.

THE rapid, economical and safe rebuilding of San Francisco depends largely upon good relations and straight business between those who have to pay for it and those who conduct the work. As yet this work has barely commenced. Though much temporary construction, necessary to current business, has been done, and much rehabilitation of injured but not destroyed steel frame structures has been effected, the new upbuilding of the permanent city has barely commenced. In the very nature of things, it could not be far advanced to this time, but soon we should see great strides toward this end.

Will the results of these first steps inspire investors with confidence? In the aggregate, will the outcome of this season's work, from the investor's standpoint, encourage to other seasons of intense building activity?

Business Bargaining for Building

The kind of business bargain whereby an owner arranges to have his building erected is usually selected by himself. Ordinarily, the contractor can do no more than express a preference for some particular system and refuse to sign up on the basis of some other system. But, in normal times at least, only contractors who meet the owner's ideas as to a business basis for the bargain, can hope to get the job. Now, in the best of times there is in the aggregate a large proportion of dissatisfaction on the part of owners, with the results of business settlements on building jobs. And, as it is they who really establish the contract business systems, and select the one in each case for an agreement, it must be they who are largely responsible for such outcomes. Architects, of course, advise owners as to these matters, but it is the owner's decision which determines the course taken.

There is, as a rule, no necessity for an owner being disappointed over the immediate outcome of his building venture. Such disappointment is usually, in great measure, at least, the result of his own unfamiliarity with building business systems. There are four business bases on which you may bargain to have a structure built. Looking at them from a commonsense business standpoint, they may be ranked as the Distinctly Bad, the Inequitable and Unsafe, the Good but Defective, and the Safe and Sensible systems. I describe them in the order above stated.

The Lump-Sum Contract Basis

When you place your building with a contractor on the Lump-sum contract basis, you put upon him an incentive to "scamp" your work—in order that he may not lose or that he may make money. This incentive is inseparable from the system whereunder your contract is made, which system is distinctly bad.

Your contractor is to receive just so much money to cover all costs and contingencies and the profit to himself. The risks are all placed on him. The incentive to sacrifice your interests in his own behalf is direct and undeniable. It will not operate, of course, if he is entirely honest. But the incentive is there, just the same, and we all have some failings.

The world's experience has abundantly proven that the working of this Lump-sum contract system is demoralizing to contractors, and to the detriment of owners.

In taking work under competition upon this Lump-sum basis, the contractor is sure to lose on some jobs, and to make little or nothing on others. So that even your job, for which you pay a sufficient price, may be "skinned" by him, in order that he may even up the others whereon he either makes nothing or loses.

This is the position in which a contractor is placed who habitually takes Lump-sum contracts in competition with other contractors; except it be in small circles of the most favored contractors, under supervision of the strongly entrenched architects having the very best clientele.

Remember the labor you put upon each of a number of contractors in preparing bids on your work. Each one will probably have to estimate a number of jobs before he gets one. Honest estimating such work is a considerable labor. The ordinary outcome is, either haphazard estimating and subsequent fighting the architect to keep a profit-margin clear, or a secret combination of bidders against you.

Under this system the contractor is frequently forced into sacrificing either his own or his principal's interests. A supply of men has not yet been made available for the contracting business who are going to lose heavily every year or two, for the benefit of owners who insist upon following a system which makes necessary unexpected and unavoidable sacrifices of interest somewhere.

The contractor who is worthy of being asked to estimate and bid on your work at all, is worthy of being given it on a fairer basis than the Lump-sum contract, especially if he has to compete with others in getting it.

The Percentage-of-Cost Basis

When you place your building in the hands of a contractor on a Percentage-of-cost agreement, you put upon him an incentive to make the work cost more than it ought to cost—in order that he may make more money. This incentive is inseparable from the basis upon which you place your work, which basis is, to say the least, inequitable and unsafe.

Your builder is to receive for his own, ten to twenty cents, according to the agreement, for every dollar the building costs you. The more he does, without positive scandal, allow the structure to cost you, the more he receives from you for his services. The less cost which he may succeed in completing your building for, the less he receives from you for his services. The risk is all placed on you. In this case, just as in that of the Lump-sum contract, the money incentive to sacrifice your interest in his own behalf, is direct and ever present with the contractor. It may not operate. But the incentive is there, all the time.

The system tempts the contractor to put the estimate of cost, for your architect's comparison with estimates by other contractors, at less figures than the work can be well done for. What matters it to him if the estimate be too low? If the work costs more, he makes more. He can only lose a chance to estimate again for one architect or one owner. But then, if the system puts all contractors on a par in this regard, the individual contractor loses not even this privilege by estimating too low.

Here again, the fact cannot be denied; contractors under the Percentage system are forced into a false position. The system puts a premium

on sharp practice. Its principle is exactly the wrong one, on which to get a good-faith service.

Ask yourself: Do you know of a large supply of men available for any business, who are intent upon doing good work and saving money for someone else, at sacrifice of money to themselves? Until you can produce such a supply of men you probably cannot have your building work advantageously executed on the Percentage basis.

The Cost-Plus-Fixed-Sum Contract Basis

When you place your building in the hands of a contractor under the Cost-plus-fixed-sum agreement, you put upon him an incentive to neglect your work, should he see that he can profit from other jobs by so doing. This incentive is inseparable from the system, which, though an improvement on the two preceding, is yet defective.

Your contractor is to receive from you a pre-determined sum for himself, in consideration for your building being erected under his supervision or that of some of his employees or associates, at your expense. It matters not to him what the cost to you may be; his profit is assured. So long as he does not let the cost to you so much exceed your expectations as to sacrifice your good-will, he loses not even your clientage, by allowing the cost to run up. Again the risk is all placed on you.

Now a contractor can take an immense amount of business upon such a basis; for, in any event, he cannot fail to make his profit on every job. He might have jobs in every city of the United States at one and the same time, to his own advantage in every case: the limitation being only the degree wherein he could, without scandal, neglect every job in order to take others.

If there is competition in estimating for the securing of work on this basis, almost the same incentive is present with the contractor, to figure too low, as is present in estimating for contracts on the Percentage-of-costs basis. He would get a correspondingly less sum fixed in his contract, for his profit, no doubt, if he estimated low; but then, he would not get the contract at all, probably, if he did not estimate lower than the others, and his interest lies in getting as many contracts as possible, in each of which there is some certain profit and not any risk.

The Cost-plus-fixed-sum contract, while it is free from the grosser faults of the Lump-sum and the Percentage systems, yet has this failing, which is serious and which will prevent the system from being generally adopted.

The Cost-Plus-Premium-Contract Basis

When you place your building in the hands of a contractor, on the Cost-plus-premium agreement, you put a premium to him, on extra endeavor in your behalf by him, and you put a penalty on him for extra cost to you, over and above the estimate of cost. This premium and penalty feature constitutes the essence of the Cost-plus-premium contract. The system is sensible and safe.

Having agreed that, on the basis of the estimate, your contractor is to receive a named sum as his profit, your agreement further says, that of all he saves for you, under the estimate, you will pay him, in addition to the named sum, a certain percentage as a premium; and that of all excess cost over estimate (not occasioned by extra work, of course), he is to bear a certain proportion, to be retained by you out of his premium. The risk is equitably divided between you and the contractor.

This system does not tend to make gamblers of contractors, nor conduce to "skinning" of work, as the Lump-sum system does. It does not conduce to

under-estimating, and to running up the cost of work, as the Percentage system does. It does not conduce to neglect of the work, as the Percentage and Cost-plus-fixed-sum systems do. It does not conduce to antagonism between owner and contractor and between architect and contractor, as all the other systems do.

This system puts a premium on good faith, energy and special ability in the contractor, for the owner's benefit as well as the contractor's profit, and it puts a penalty on bad faith, neglect and incompetency in the contractor, for the owner's protection. But it does not penalize the contractor for what he cannot reasonably foresee, nor beyond the limit of his profit, in any case.

The principle of this system of contract agreement is absolutely right, in the honest interest of all concerned. All that can be said against it is that its application may be inconvenient in some cases and under some business conditions.

The Right System for San Francisco

For many years nearly all the contracting in San Francisco was done on the Lump-sum basis. The building business in general became much demoralized under its influence. The contractors said that the owners were responsible for it all, and that they, the contractors, would gladly get away from it if they could.

The great fire of April, 1906, was followed by labor and material supply conditions such that the contractors refused to take Lump-sum contracts. Owners and architects could not but acknowledge the impossibility of closely estimating on the cost of work, for the time being, so that during the first year of rebuilding nearly all of the work has been done on the Percentage basis, and the balance chiefly on the Cost-plus-fixed-sum basis.

This was a complete revulsion from the old system. Formerly all of the risk was placed on the contractor. The change placed it all on the owner. The outcome has not been satisfactory to owners. Probably, before long conditions will be such that most owners will refuse to enter into percentage contracts. The first tendency will be to go back to the Lump-sum system. It would be a misfortune for San Francisco if this course were followed. Things are bad enough in building now; but under lump-sum contracting they would be infinitely worse. Every architect and contractor knows this to be true, and every frank and outspoken one will tell you that it is true. Every owner is materially interested in preventing a return to the demoralizing system of the past at such a crucial time in the rebuilding of our city.

There is no necessity for such a course. The Cost-plus-premium system of contracting has for the owner every fair advantage and protection which the Lump-sum system has. It is equitable and stimulating to the contractor, and enables him to profit by good faith, energy and ability. It has none of the vicious tendencies of the Lump-sum system, none of the weaknesses and loopholes of the Percentage system. It does not tend to demoralize contracting as a business. It is most favorable to clean business, and consequently to good construction at least cost.

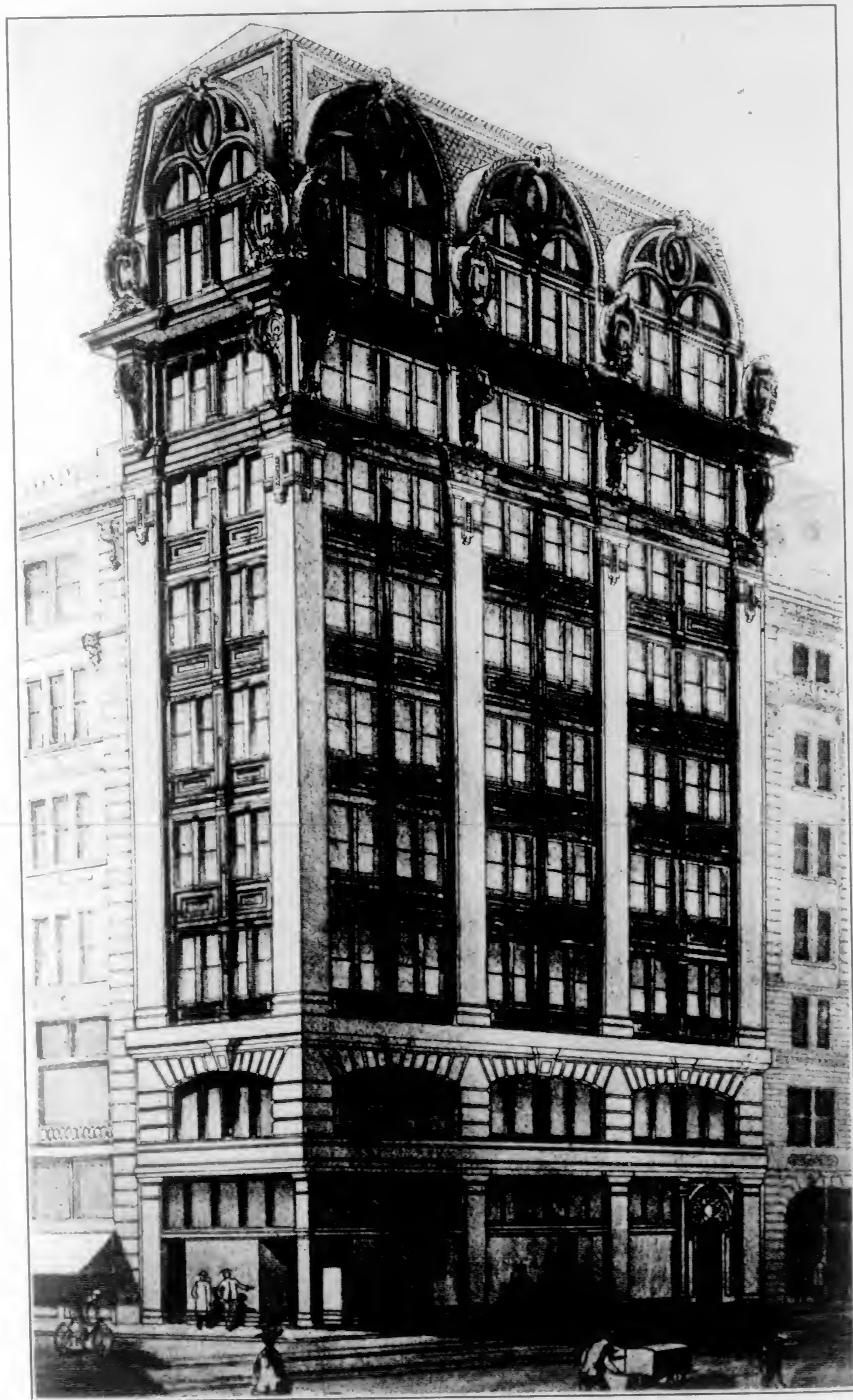
It would seem that the property owners and the architects just now have the opportunity to put the building business on a clean business basis. Not an untried one; but a fully proven one. As the professional adviser of the owner, much responsibility rests upon the architect.

* * *

"All right on behind there?" called the conductor from the front of the car.

"Hold on," cried a shrill voice. "Wait till I get my clothes on!"

The passengers craned their necks expectantly. A small boy was struggling to get a basket of laundry aboard.



The M. A. Guast Building, Third and Mission Streets, San Francisco
Lansburgh & Joseph, Architects
Equipped with Otis Elevators

Reinforced Concrete Practice in San Francisco --- Column Design

By WM. HAM. HALL, C. E.

THERE are many reinforced concrete buildings in course of erection in San Francisco. The practice, in matter of design, is, to speak moderately, incongruous. The eighteen column examples herewith presented illustrate this fact. They represent the standard first-story interior columns in eighteen different buildings, and the drawings are to uniform scale from actual measurements.

Reinforced Concrete Practice in San Francisco --- Column Design.

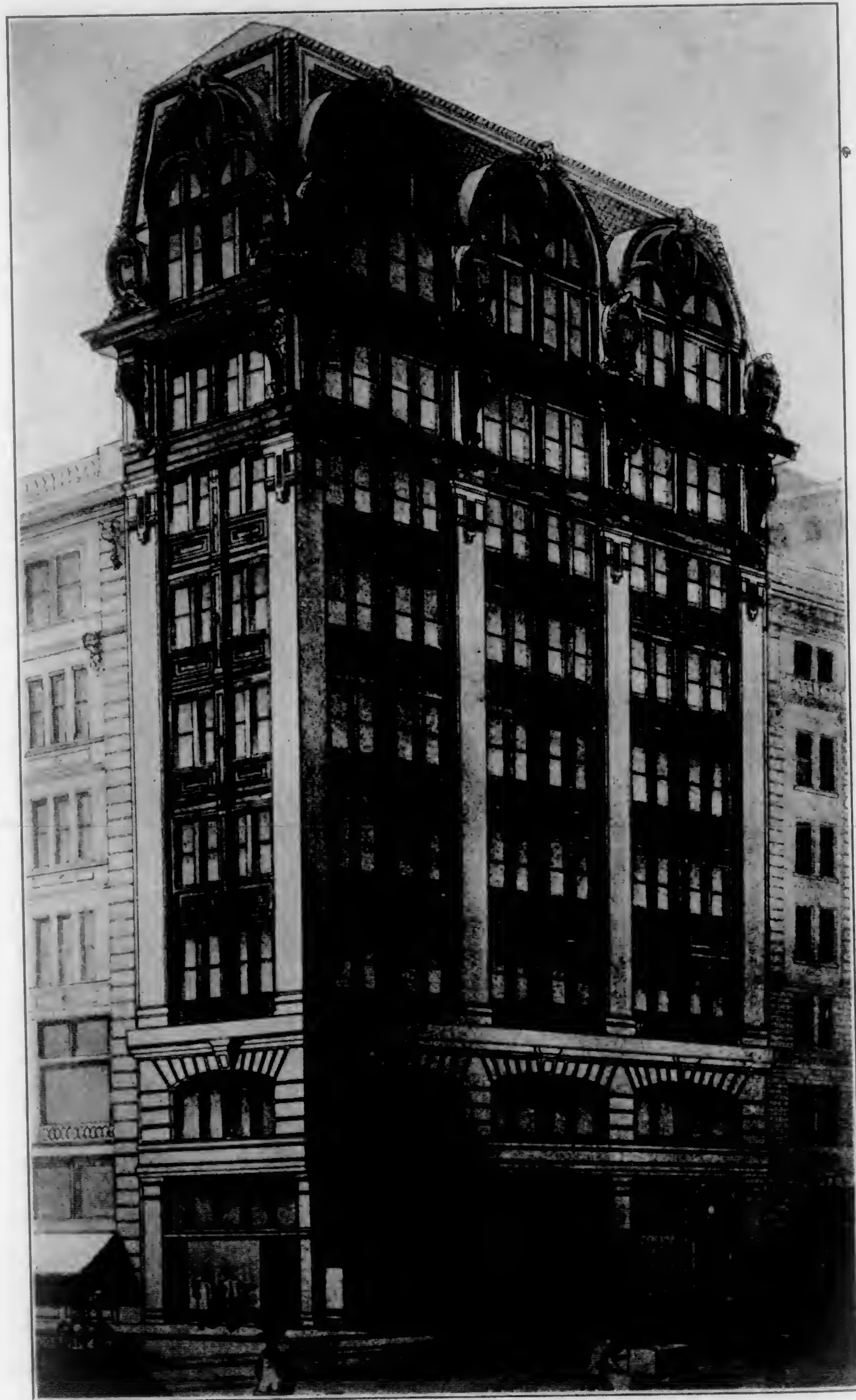
No.	Character.	No. of Stories	Height of Columns.	Areas of Concrete.		Area of Steel.	Ratio of Steel to Concrete.	
				Total.	Banded.		To Total.	To Banded.
1	Warehouse.	6 & b	16' 0"	709.3	419.7	2.65	0.87	0.59
2	Store.	3 & b	17' 6"	564.9	396.9	3.12	0.55	0.79
3	Store.	5 & b	13' 6"	570.5	318.5	3.53	0.62	1.11
4	Office.	3 & b	17' 6"	769.8	569.0	6.24	0.81	1.10
5	Office & Warehouse.	3 & b	17' 0"	328.2	223.9	3.12	0.95	1.39
6	Office.	8 & b	17' 0"	433.5	309.5	4.71	1.09	1.52
7	Factory.	5 & b	13' 6"	597.7	323.8	6.28	1.05	1.94
8	Office.	7 & b	17' 6"	471.1	292.5	6.12	1.30	2.09
9	Warehouse.	6 & b	15' 0"	711.9	400.4	15.12	2.12	3.78
10	Factory.	4 & b	14' 0"	391.9	259.8	9.00	2.30	3.46
11	Office.	3 & b	17' 9"	247.7	149.8	6.28	2.51	4.19
12	Store.	6 & b	22' 0"	517.8		13.50	2.61	
13	Office.	9 & b	20' 0"	462.8	269.1	19.24	4.16	7.45
14	Warehouse.	8 & b	18' 0"	533.4	353.5	26.56	4.98	7.51
15	Office.	8 & b	16' 6"	774.6	477.5	53.39	6.89	11.48
16	Factory.	4 & b	12' 0"	303.4	169.5	20.64	6.90	12.48
17	Warehouse & Office.	3 & b	15' 6"	453.2	173.2	22.81	5.03	13.47
18	Warehouse.	8	10' 0"	479.0	257.7	56.55	11.84	21.94

NOTE: All areas are given in square inches.

The proportion of reinforcing steel to the concrete in columns must vary somewhat, of course. The length and loading of column, the special design, the character of steel, the allowance for bracing, all call for more or for less steel in proportion to concrete, in each case. But safe, as well as economical, designing will always keep the total of these variations within moderate limits as compared to those shown by the figures of these eighteen examples.

Inspection of this data, even after allowance is made for the unstated possibilities in each case, is startling. It is not too much to say that they seem to put the designers of many of these buildings on the defensive. They (that is, the figures) stand forth and accuse each other in a scandalous manner. Probably something may be said in several of these cases to modify the appearances of bad design which the basic facts seem to convey.

As a primary step toward analysis of this group of examples, just note that the percentage of steel, to banded concrete, in one six-story and basement warehouse column is about one half of one per cent, while in



The M. A. Gunst Building, Third and Mission Streets, San Francisco
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By WM. HAM. HALL, C. E.

THERE are many reinforced concrete buildings in course of erection in San Francisco. The practice, in matter of design, is, to speak moderately, incongruous. The eighteen column examples herewith presented illustrate this fact. They represent the standard first-story interior columns in eighteen different buildings, and the drawings are to uniform scale from actual measurements.

Reinforced Concrete Practice in San Francisco

Column Design.

No.	Character.	No. of Stories.	Heights of Columns.	* Areas of Concrete.		* Area of Steel.	Ratio of Steel to Concrete.	
				Total.	Banded.		To Total.	To Banded.
1	Warehouse.....	6 & b	16' 0"	709.3	449.7	2.65	0.37	0.59
2	Store.....	3 & b	17' 6"	564.9	396.9	3.12	0.55	0.79
3	Store.....	5 & b	13' 6"	570.5	318.5	3.53	0.62	1.11
4	Office.....	3 & b	17' 6"	769.8	569.0	6.24	0.81	1.10
5	Office & Warehouse.	3 & b	17' 0"	328.2	223.9	3.12	0.95	1.39
6	Office.....	8 & b	17' 0"	433.5	309.5	4.71	1.09	1.52
7	Factory.....	5 & b	13' 6"	597.7	323.8	6.28	1.05	1.94
8	Office.....	7 & b	17' 6"	471.1	292.5	6.12	1.30	2.09
9	Warehouse.....	6 & b	15' 0"	711.9	400.4	15.12	2.12	3.78
10	Factory.....	4 & b	14' 0"	391.9	259.8	9.00	2.30	3.46
11	Office.....	3 & b	17' 9"	247.7	149.8	6.28	2.54	4.19
12	Store.....	6 & b	22' 0"	517.8		13.50	2.61	
13	Office.....	9 & b	20' 0"	462.8	269.1	19.24	4.16	7.15
14	Warehouse.....	8 & b	18' 0"	533.4	353.5	26.56	4.98	7.51
15	Office.....	8 & b	16' 6"	774.6	477.5	53.39	6.89	11.18
16	Factory.....	4 & b	12' 0"	303.4	169.5	20.64	6.90	12.18
17	Warehouse & Office.	3 & b	15' 6"	453.2	173.2	22.81	5.03	13.17
18	Warehouse.....	8	10' 0"	479.0	257.7	56.55	11.81	21.94

* NOTE: All areas are given in square inches.

The proportion of reinforcing steel to the concrete in columns must vary somewhat, of course. The length and loading of column, the special design, the character of steel, the allowance for bracing, all call for more or for less steel in proportion to concrete, in each case. But safe, as well as economical, designing will always keep the total of these variations within moderate limits as compared to those shown by the figures of these eighteen examples.

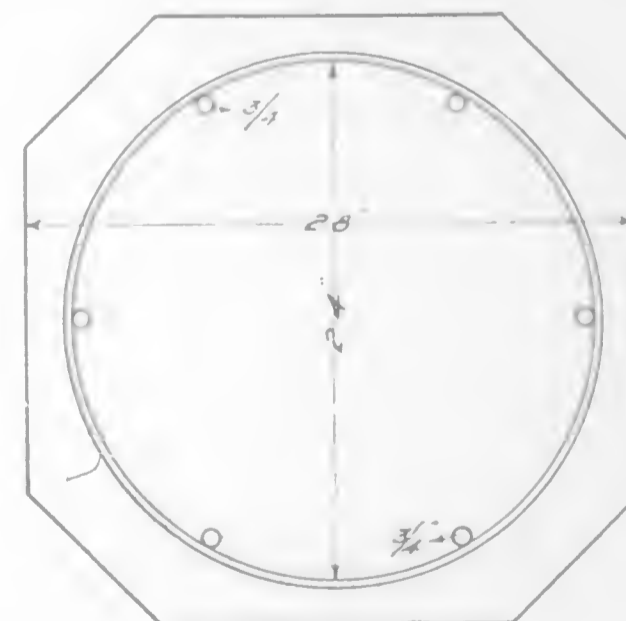
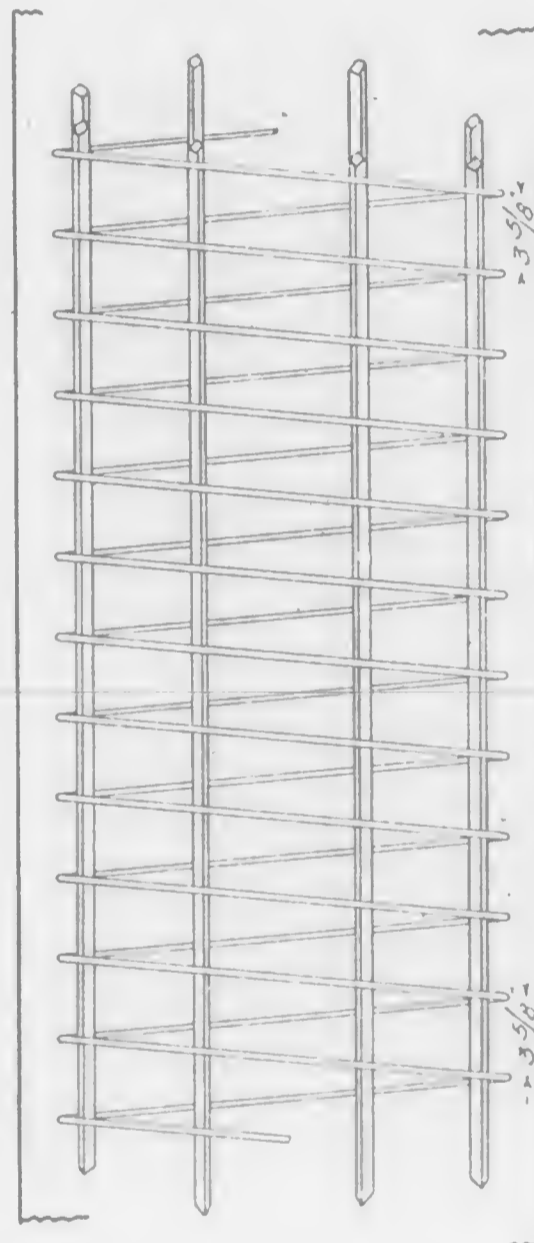
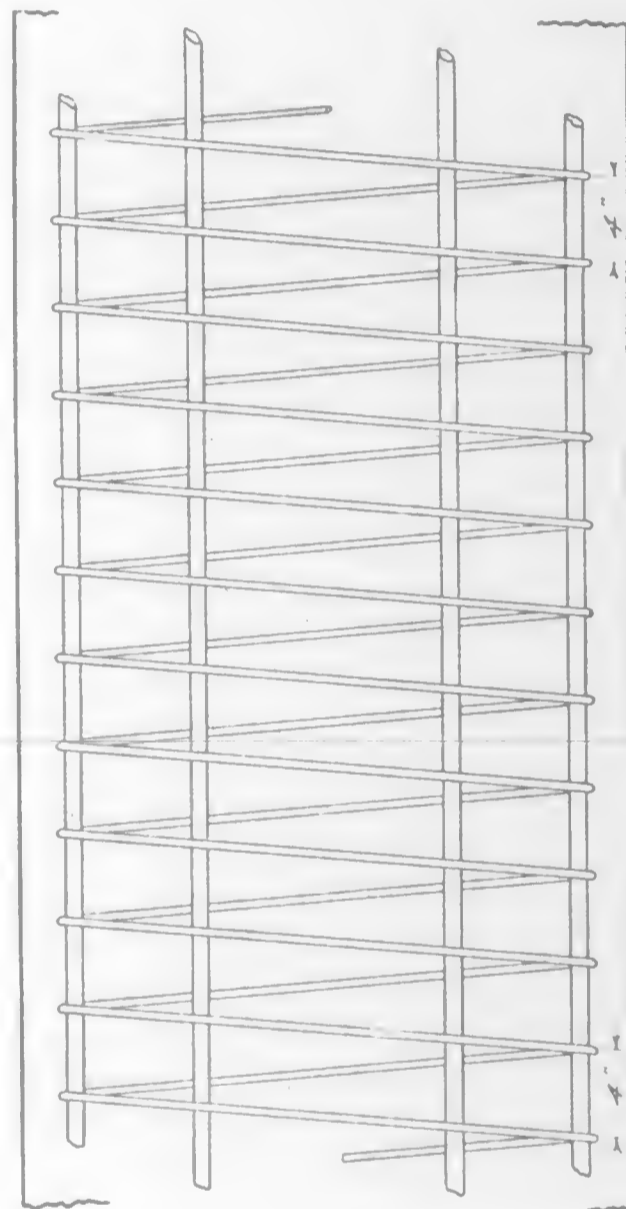
Inspection of this data, even after allowance is made for the unstated possibilities in each case, is startling. It is not too much to say that they seem to put the designers of many of these buildings on the defensive. They (that is, the figures) stand forth and accuse each other in a scandalous manner. Probably something may be said in several of these cases to modify the appearances of bad design which the basic facts seem to convey.

As a primary step toward analysis of this group of examples, just note that the percentage of steel, to banded concrete, in one six-story and basement warehouse column is about one half of one per cent, while in

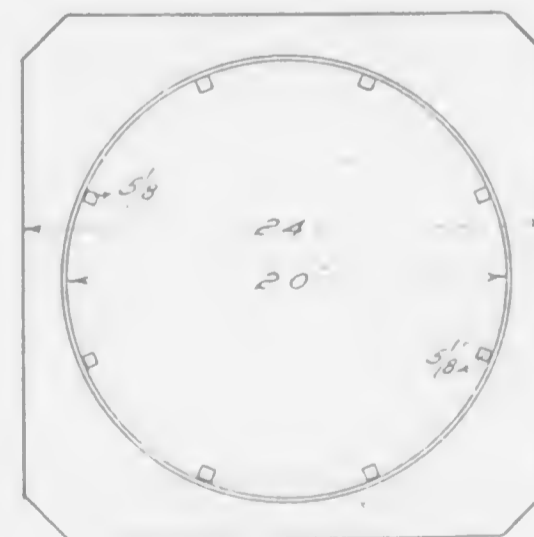
another eight-story and basement warehouse column it is about twenty-two per cent. Apply a few figures and a little reasoning all along the list of examples, and see where you land.

These column plans and figures, selected from a much greater number collected, constitute the first of several exhibits intended to illustrate, in a concise and practical way, some of the work of rebuilding San Francisco. Rejecting the excrescences and making allowances, such as seem reasonable, in the figures of the other examples, there is yet discernible a wide variation in the proportions of steel to concrete designed to effect substantially like duties. This should not be. Either safety or economy, or both, must be sacrificed somewhere, to bring out such a showing.

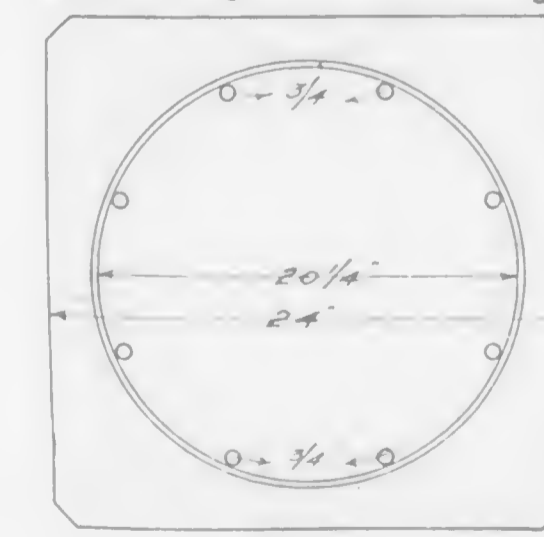
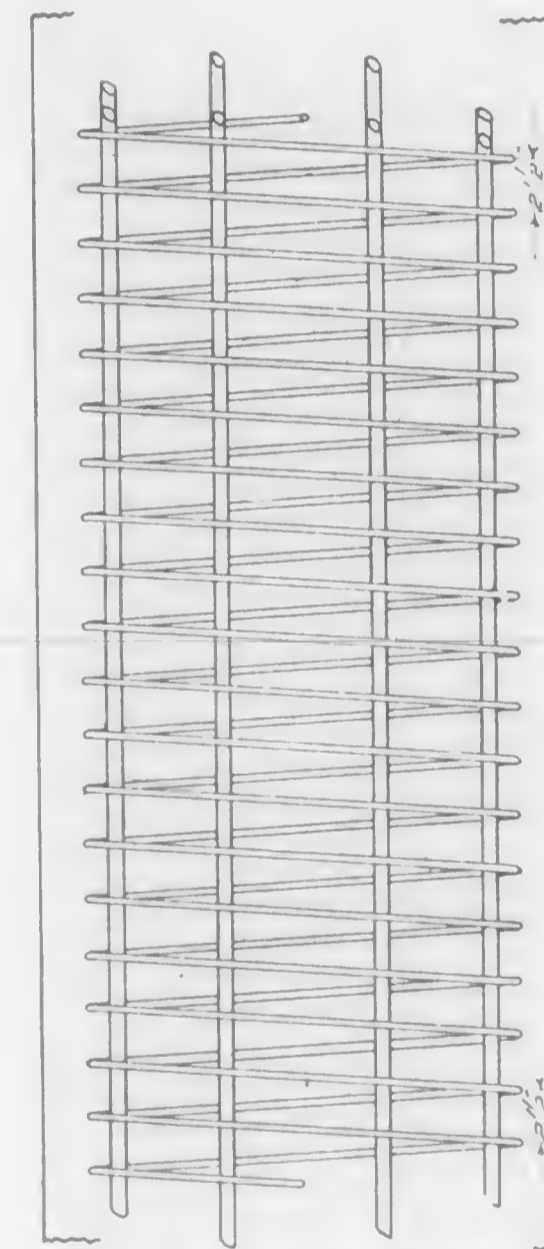
If there is too little steel in proportion to concrete, a column is liable to fail—there not being enough steel to prevent fracture or shear, conse-



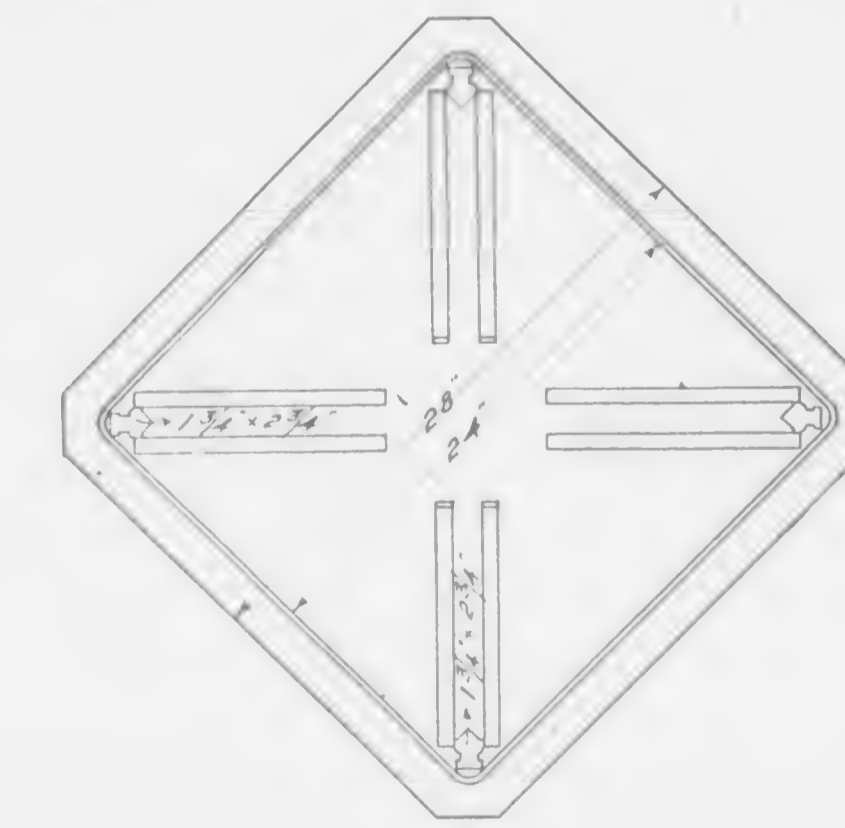
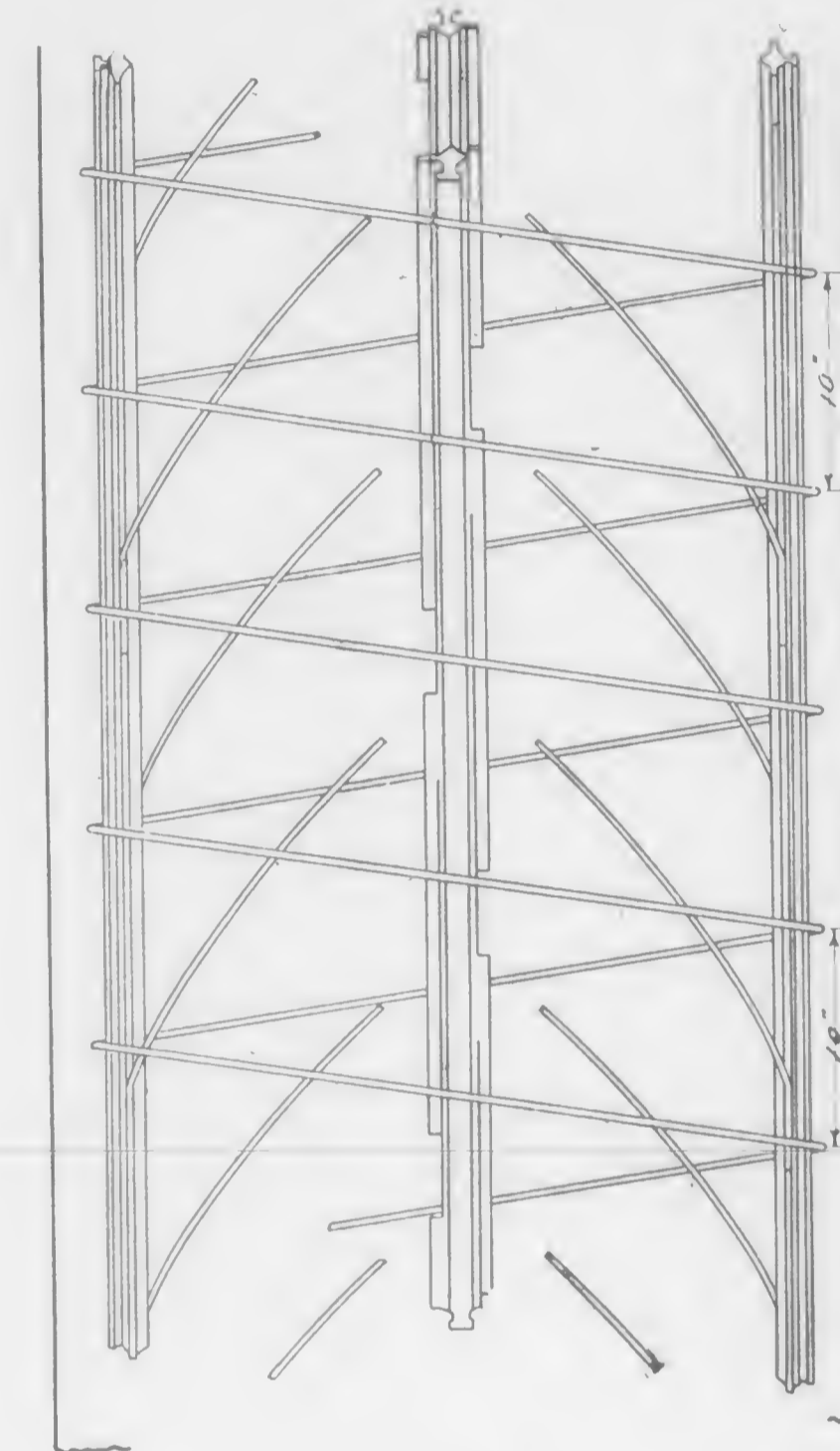
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No. 2



No. 3



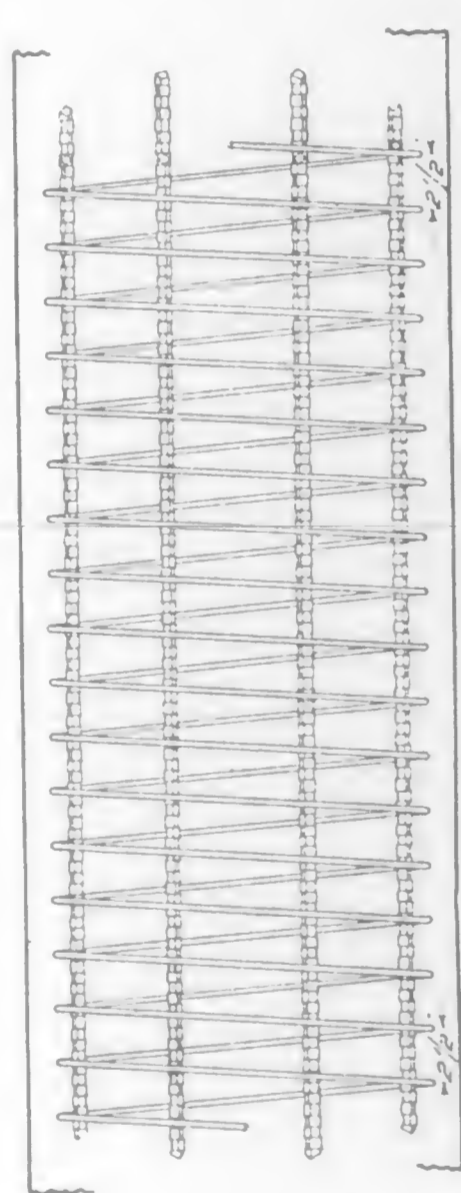
No. 4

quent upon jar, shake, or loading. On the other hand, the first effect of too much steel in proportion to concrete is waste of money; and as the proportion of steel to concrete is made greater still, not only is the money waste increased, but again the column becomes unsafe—there not being enough concrete either to itself meet the imposed duty or to

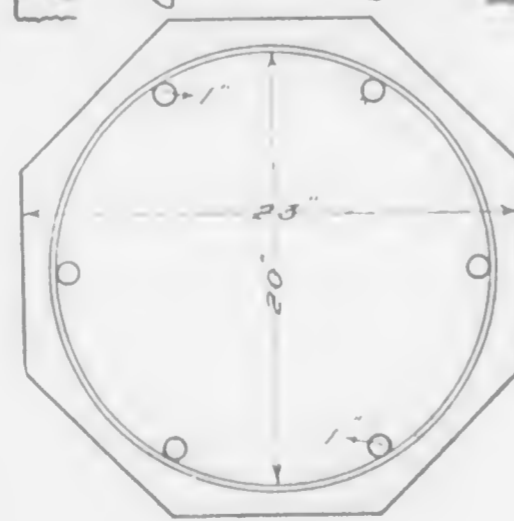
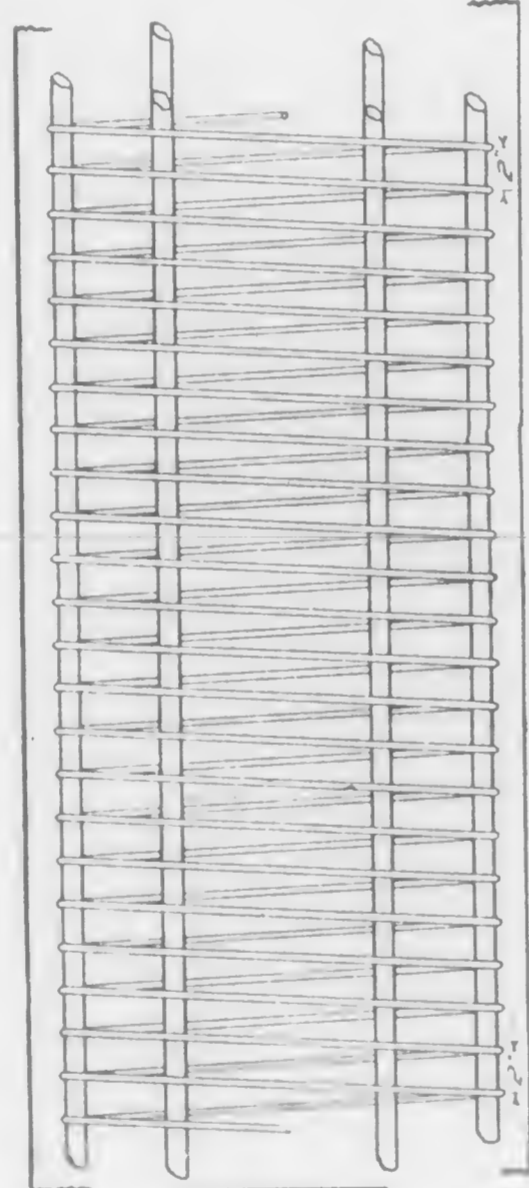
hold in place and put into effect the purposes of the steel and of the excess steel in helping to meet that duty.

Viewed broadly, the designing of columns in the reinforced concrete constructions of San Francisco, seems to show: In some cases, either ignorance of what is safe, or a determination to save money at the expense of structural safety; in other cases, ignorance of, or lack of confidence in, what is just right in design, and determination to be on the safe side in the matter of reinforcement strength, at the sacrifice of economy; in still other cases, a weak concession to the desire to keep down sizes of interior columns, and as a consequence, the reduction of concrete and increase of steel to take its place in compression, until the danger point, at the other extreme of conditions, has been approached.

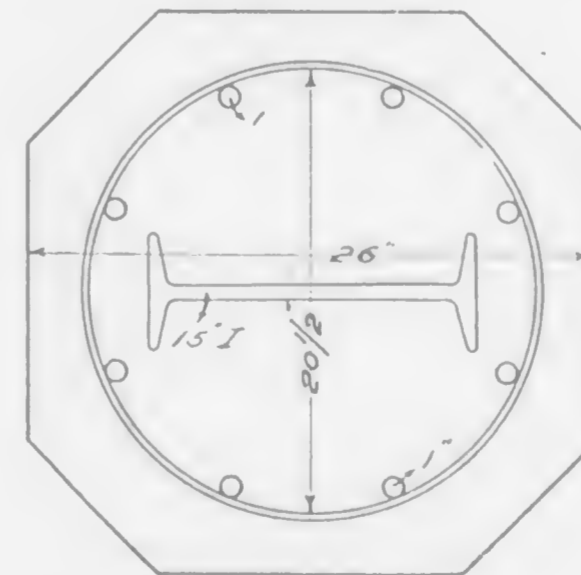
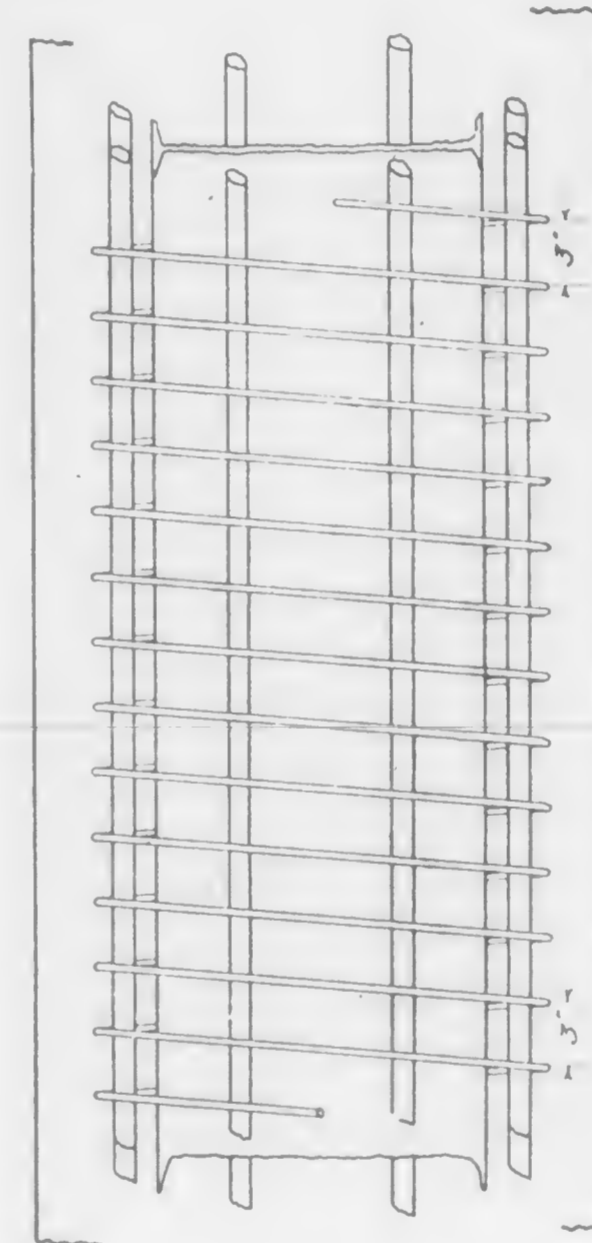
Of course, to discuss the problems of design, structurally, the column distances and proposed loadings in these examples must be known, and these will be given in a separate memorandum relating to the girders, beams and floor slabs. Probably the case is not so bad for some of the



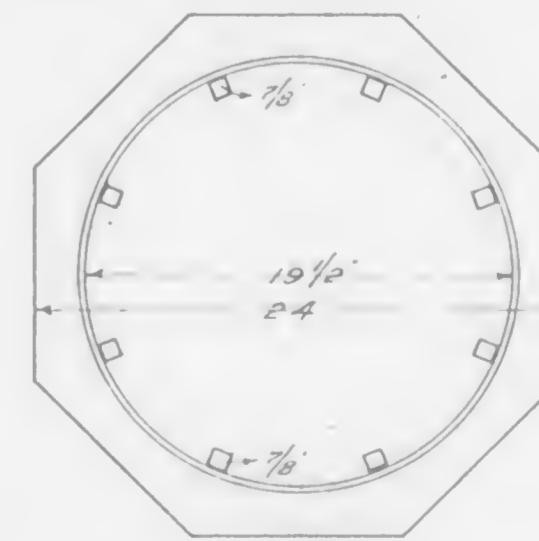
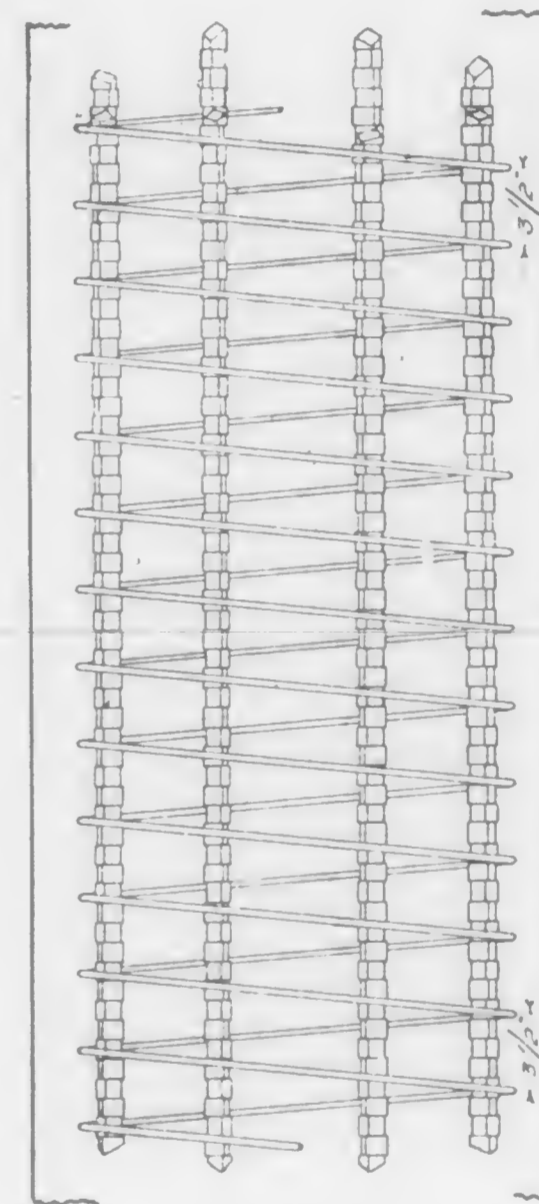
No. 5



No. 6



No. 7



No. 8

structures as the present figures taken by themselves seem to indicate. But the broad primary lesson would remain unchanged—that, undeniably, in a number of these cases, design has not been governed by an expert study of economy, and in some of them, safety has not been well assured. Some of these plannings never would have been put into execution had there been competent alert inspection of building construction in San Francisco. The owners of others have had money wasted for them.

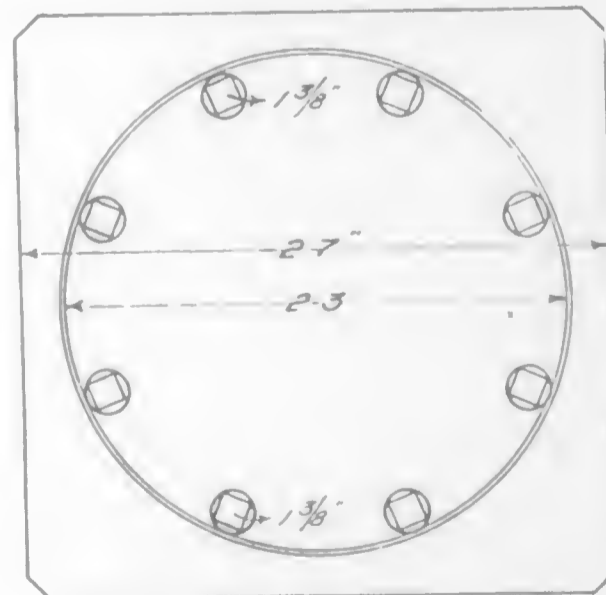
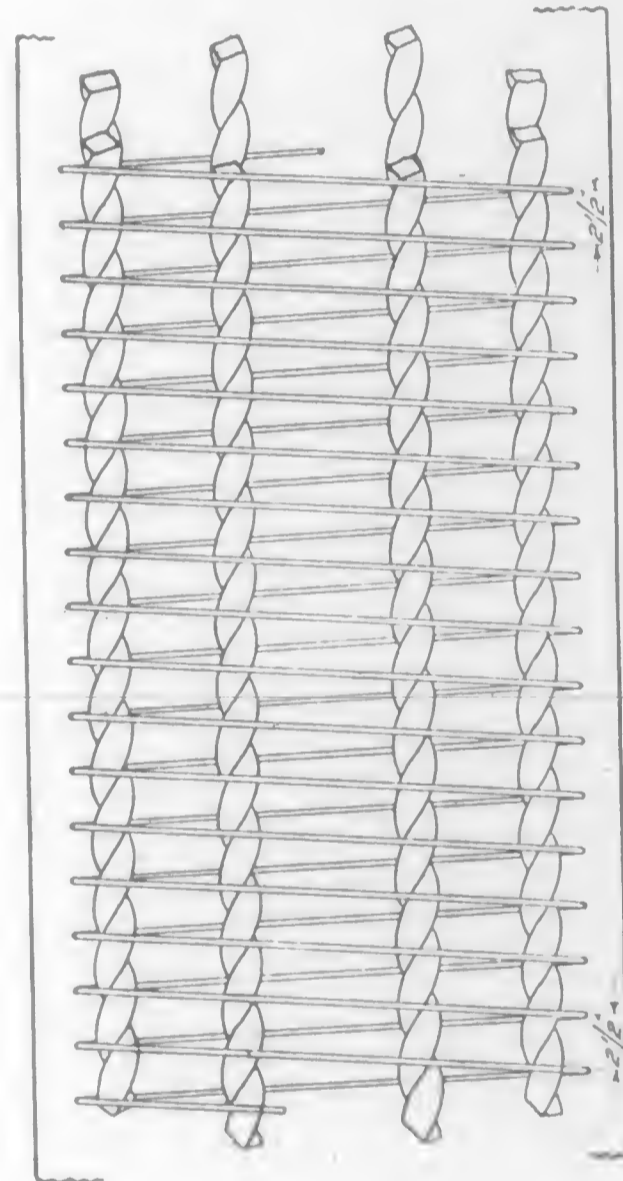
This exhibit is not to be taken as argument against reinforced concrete construction, but merely as emphasizing the necessity for such work being designed by competent specialists, only. A somewhat similar showing can be made with respect to steel skeleton designing in San Francisco, and I shall in a separate memorandum present it.

The accompanying cuts will be found of interest, not only as illustrations

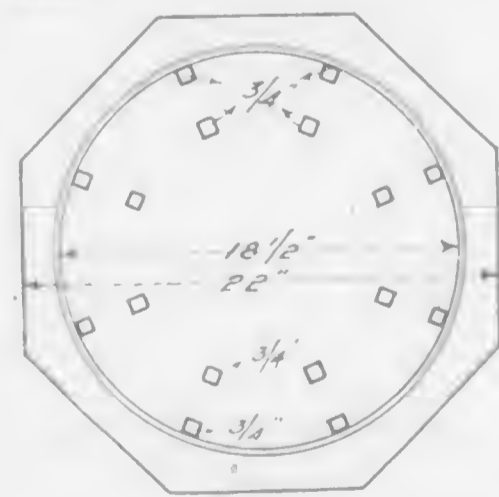
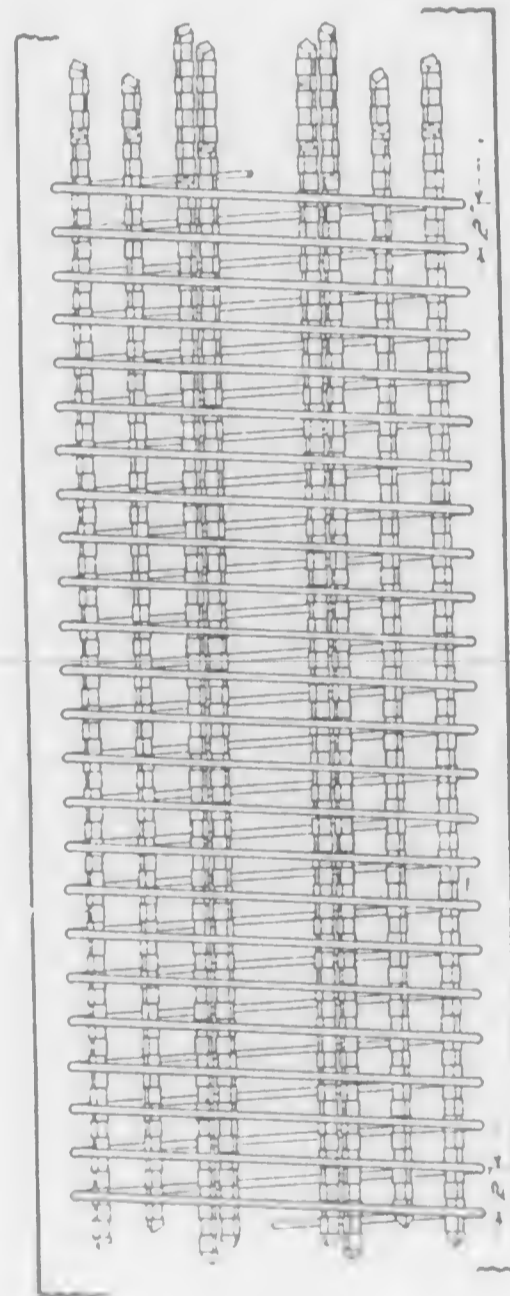
of the foregoing points, but as showing, in part, the wide range of planning covered by the San Francisco practice to this time. In fact, some are inclined to grope in parts of the domain of experiment which have already been explored by others elsewhere.

In these eighteen examples there are eight or nine columns, the figuring of each of which is materially different. Of the eighteen, one is a positive freak, quite ignoring the basic principles of the reinforcing of concrete; two others are oddities for whose use it would be difficult to find excuse; and in all, six or seven show at a glance that they came from inexperienced hands or for some reason are well away from good models and sound ideas. These points are quite aside from the question of too much or too little steel in proportion to concrete, already adverted to.

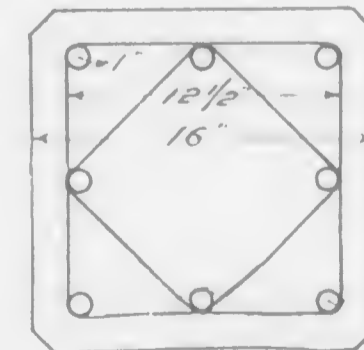
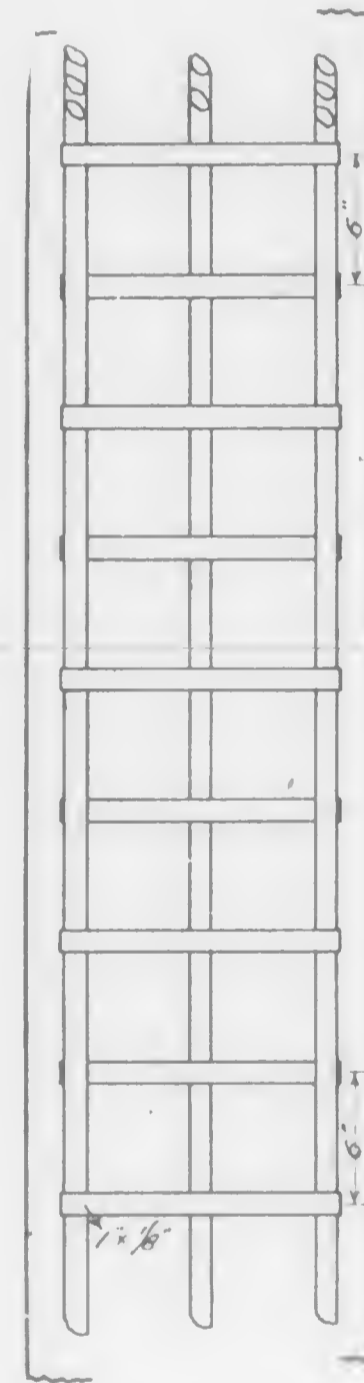
Not referring to forms of steel at all, there are shown examples of each of



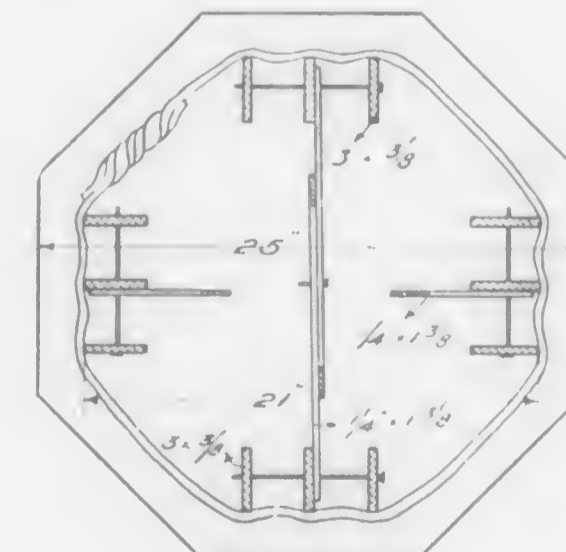
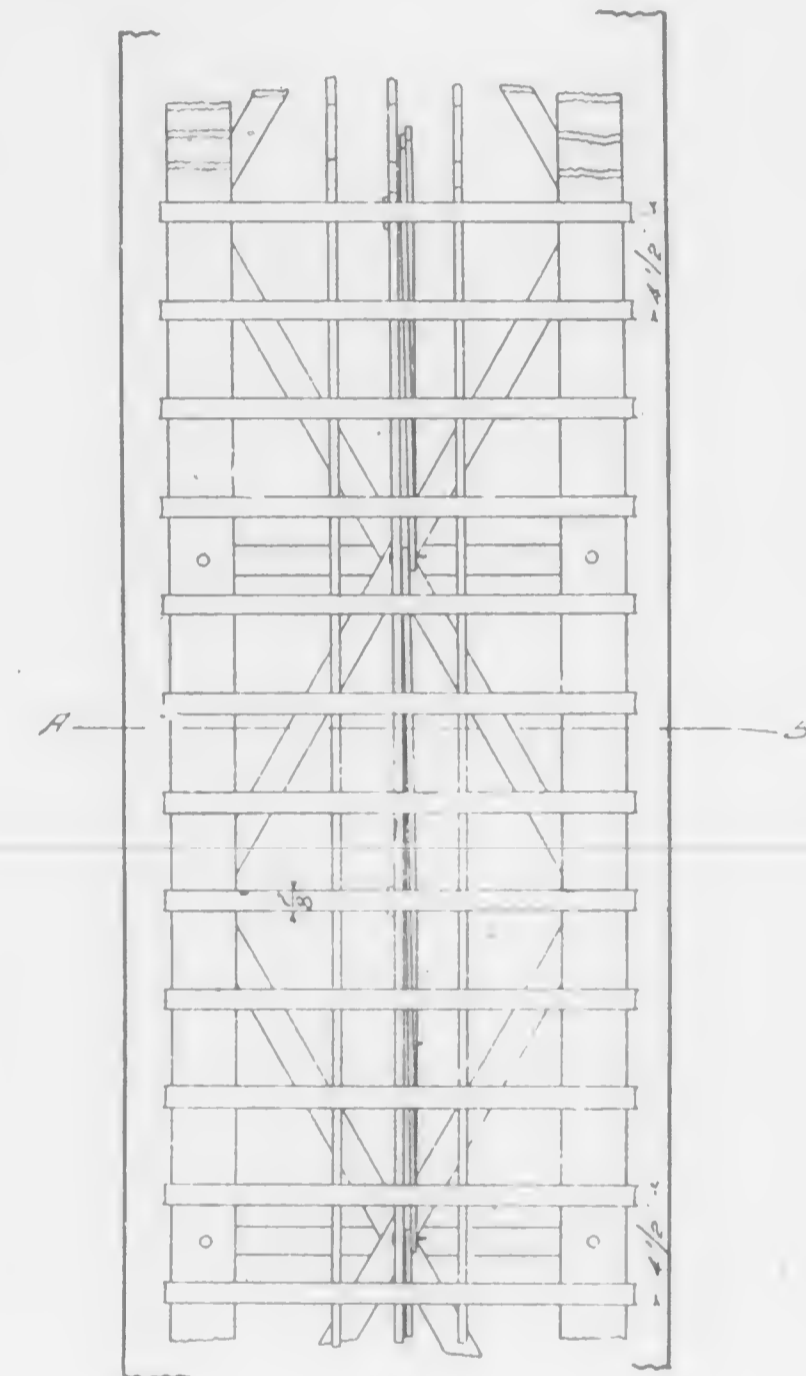
No. 9



No. 10



No. 11



No. 12

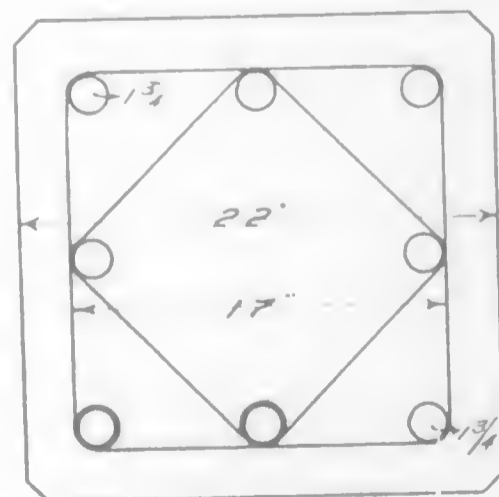
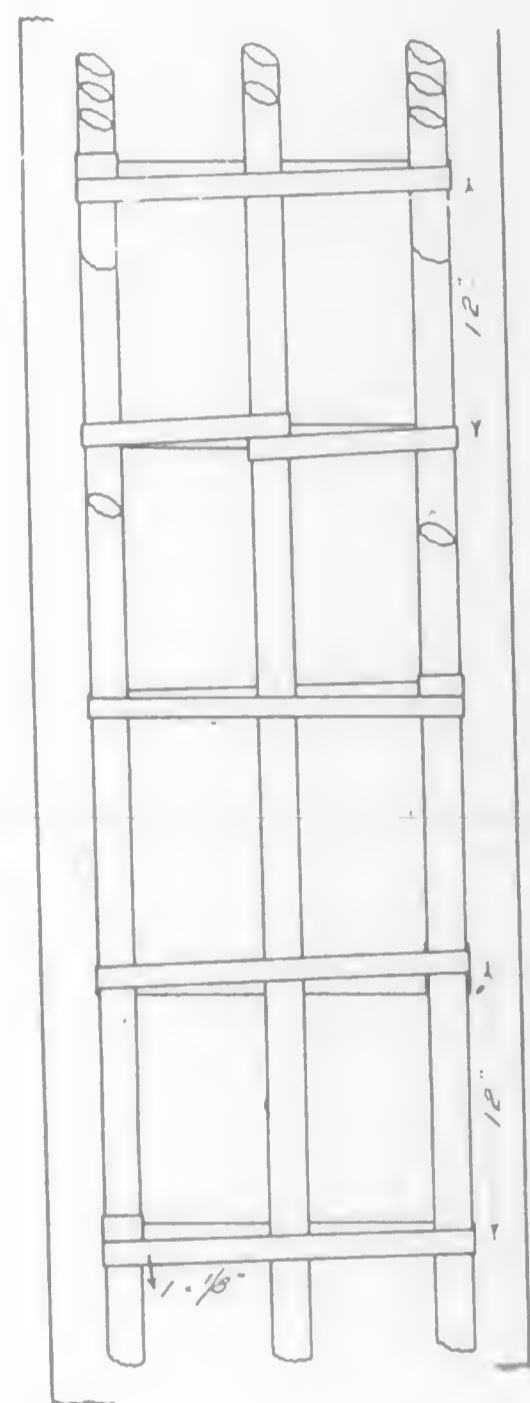
two good types of column reinforcement, namely the spiralled, Nos. 5, 6, 9 and others, and the strapped, Nos. 11, 13 and others. But each of these types is defectively applied in more than one case. The Kahn bar type, No. 4, is a specialty to which I do not allude, one way or the other, in this connection.

The eye-beam shown in column No. 7 is not counted in the estimate of its steel, seeing that only a few columns of the building were thus armored, and for a special local duty, only.

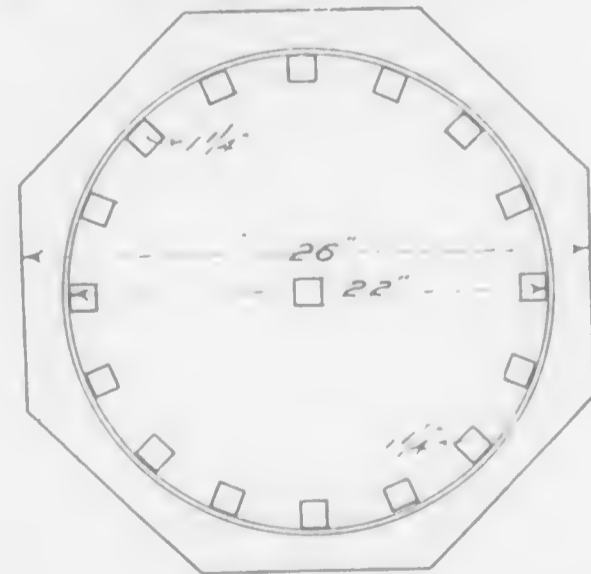
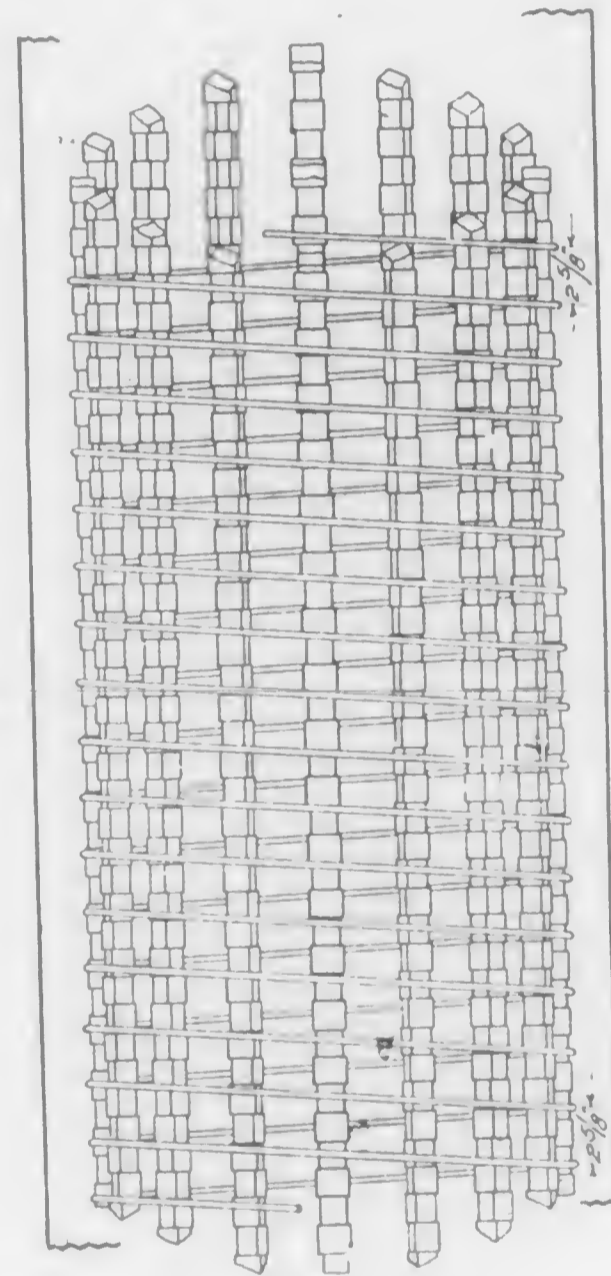
I have not named the buildings from which these eighteen examples are taken, for the reason that the questions to which they give rise can be as well discussed without locating them, and the danger of doing some personal in-

justice or individual building harm is thus avoided. But I will very willingly identify each example for the information of those who may wish to look further into the matter. While it will develop that I lay bare in these articles, more specifically than yet done, some of the crudities and abuses of reinforced concrete building in San Francisco, it will be found that I do so in the interest of sound practice in that art, which many believe is being endangered by that which is unsound.

The situation is that a type of building, wholly unfamiliar to almost every practitioner of building design and of building construction in San Francisco, was shown by the great earthquake and fire to have qualities specially desirable

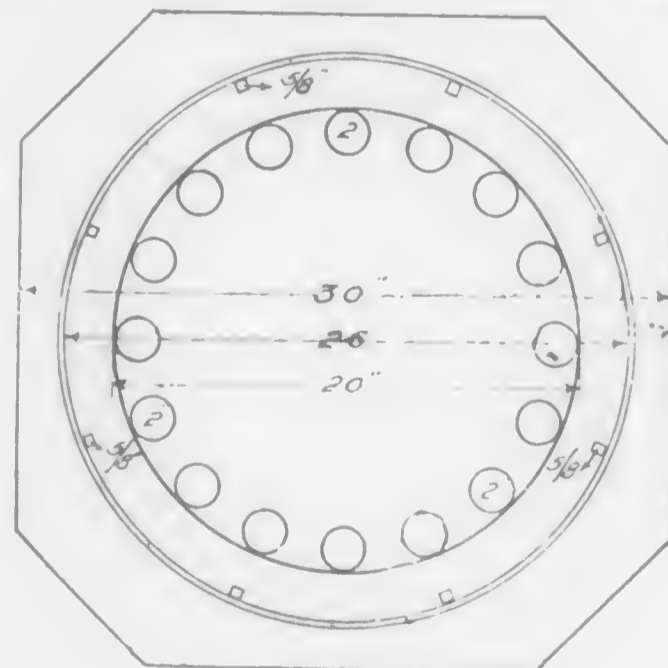
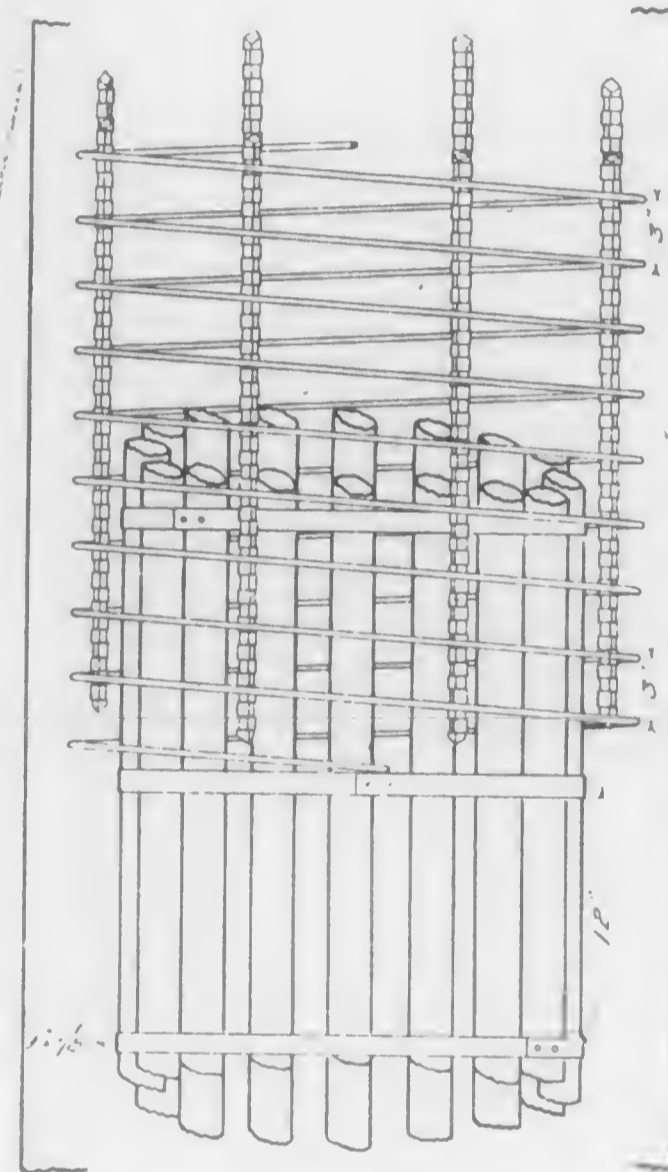


No. 13

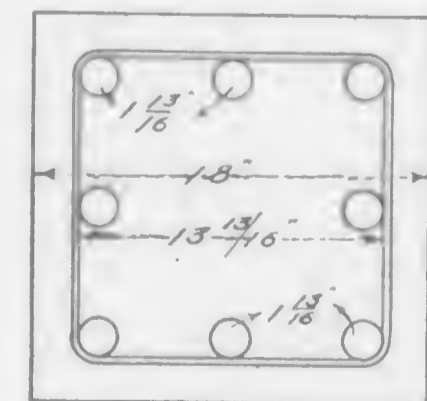
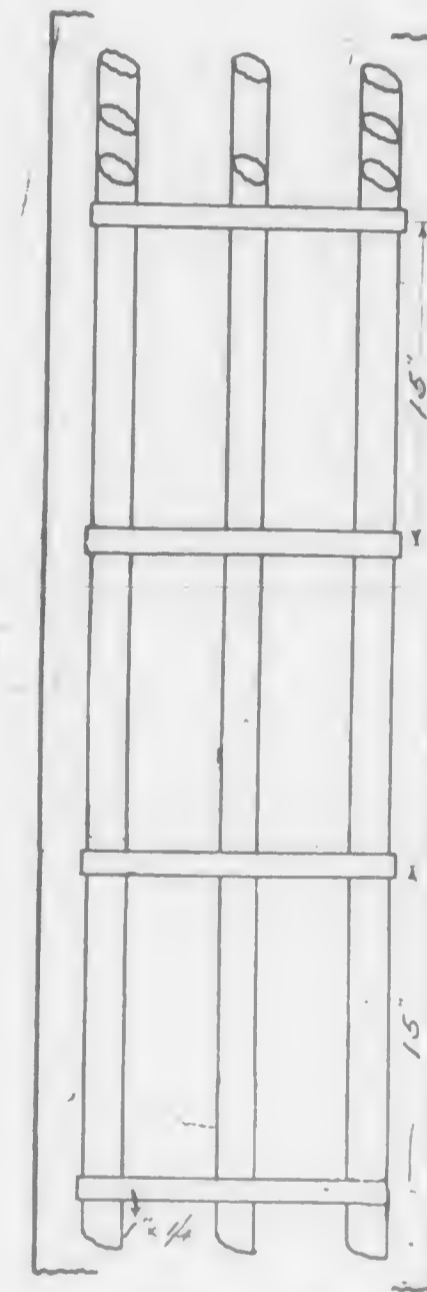


No. 14

in structures here. Other architects and other builders came from elsewhere, claiming special knowledge of and wide experience in this new thing. With some of these new comers these claims were false. There was a whoop-up for the locally new idea. Quite a number of owners forthwith wanted reinforced concrete. The facts that buildings of the type are necessarily engineering constructions, that to design them for safety and at the same time for economy is a purely engineering function, that to build them well is distinctly an engineering art, and that intelligent faithfulness and not mere money-making "business", must ceaselessly watch over the whole, have been largely ignored. Moreover, we appear to have no safeguard whatever in municipal inspection and supervision of building, against the erection of almost anything which a designer or builder may choose to palm off on an owner as a well-planned reinforced concrete structure.

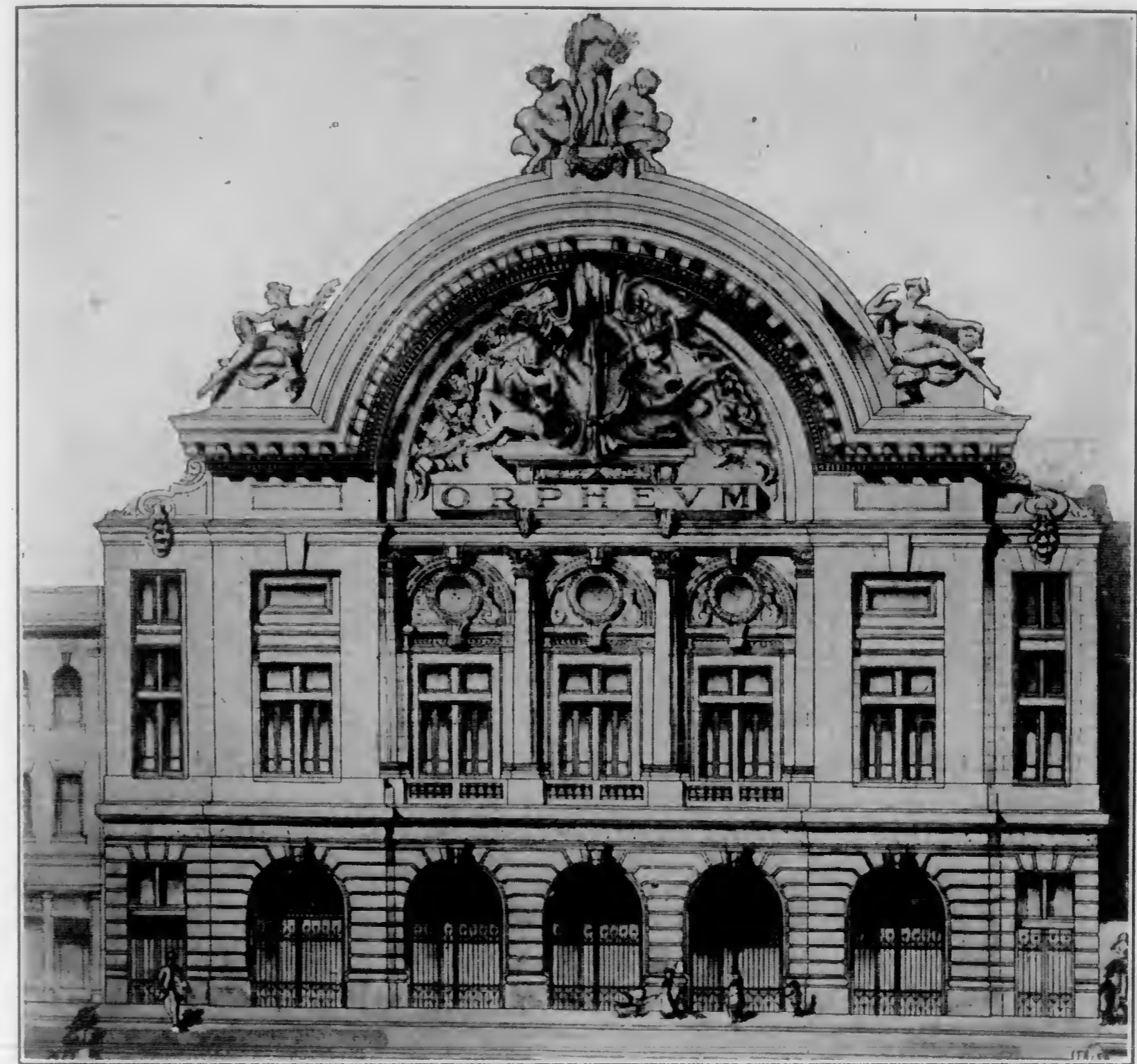
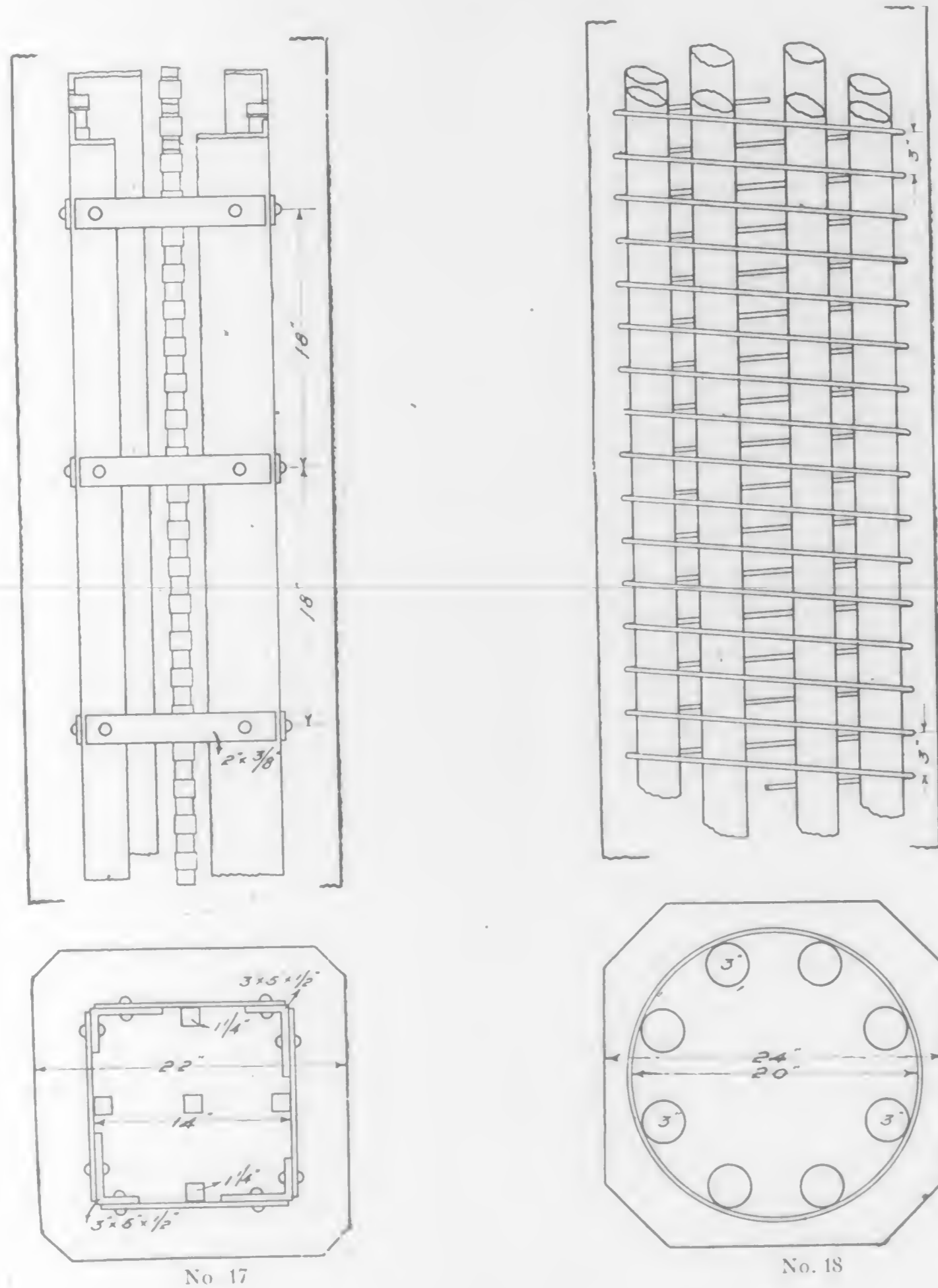


No. 15



No. 16

And now we hear volumes of adverse small talk and large talk against reinforced concrete; and not the least interesting part of it all is that the small talk about all comes from large people and the large talk from small people, measured financially, as well as mentally, of course. There is necessity for helping the public towards a better understanding of this subject. It is unfortunate that any attempt to do so may be misinterpreted.

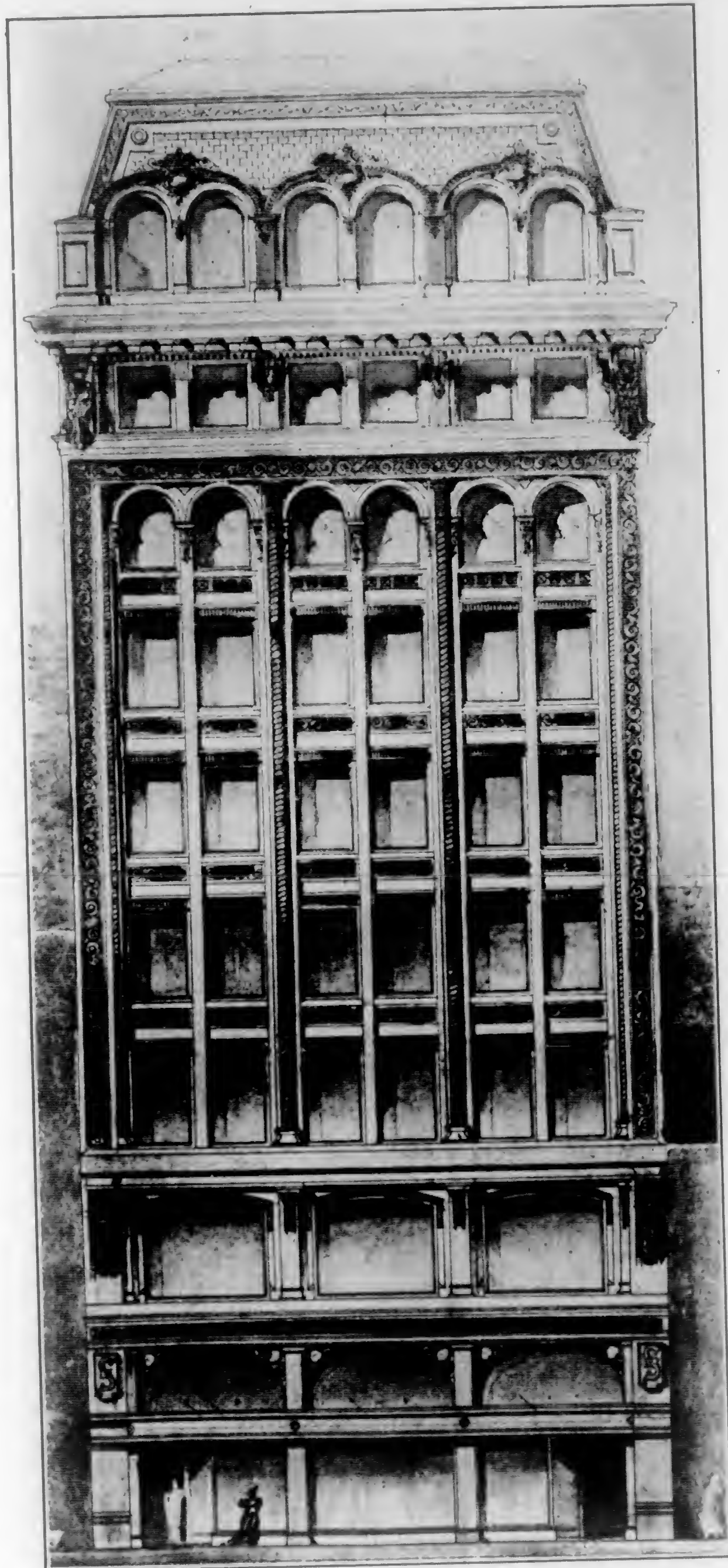


Design for Orpheum Theater, San Francisco
Lansburgh & Joseph, Architects

The Steel Frame and its Part in the Rebuilding of San Francisco

THE memorable and now historic April 18, 1906, may be said to have inaugurated a new and notable era in the building annals of the City of San Francisco. The cataclysm which marked that and the succeeding few days cannot, from the standpoint of the architect and the builder, be regarded as entirely in the light of a calamity unmixed with blessing for this and future generations. The fruits of the wonderful energy put forth during the past twelve months, must inevitably lead to the upbuilding of a city which shall in all respects conform to the highest ideals of modern American effort.

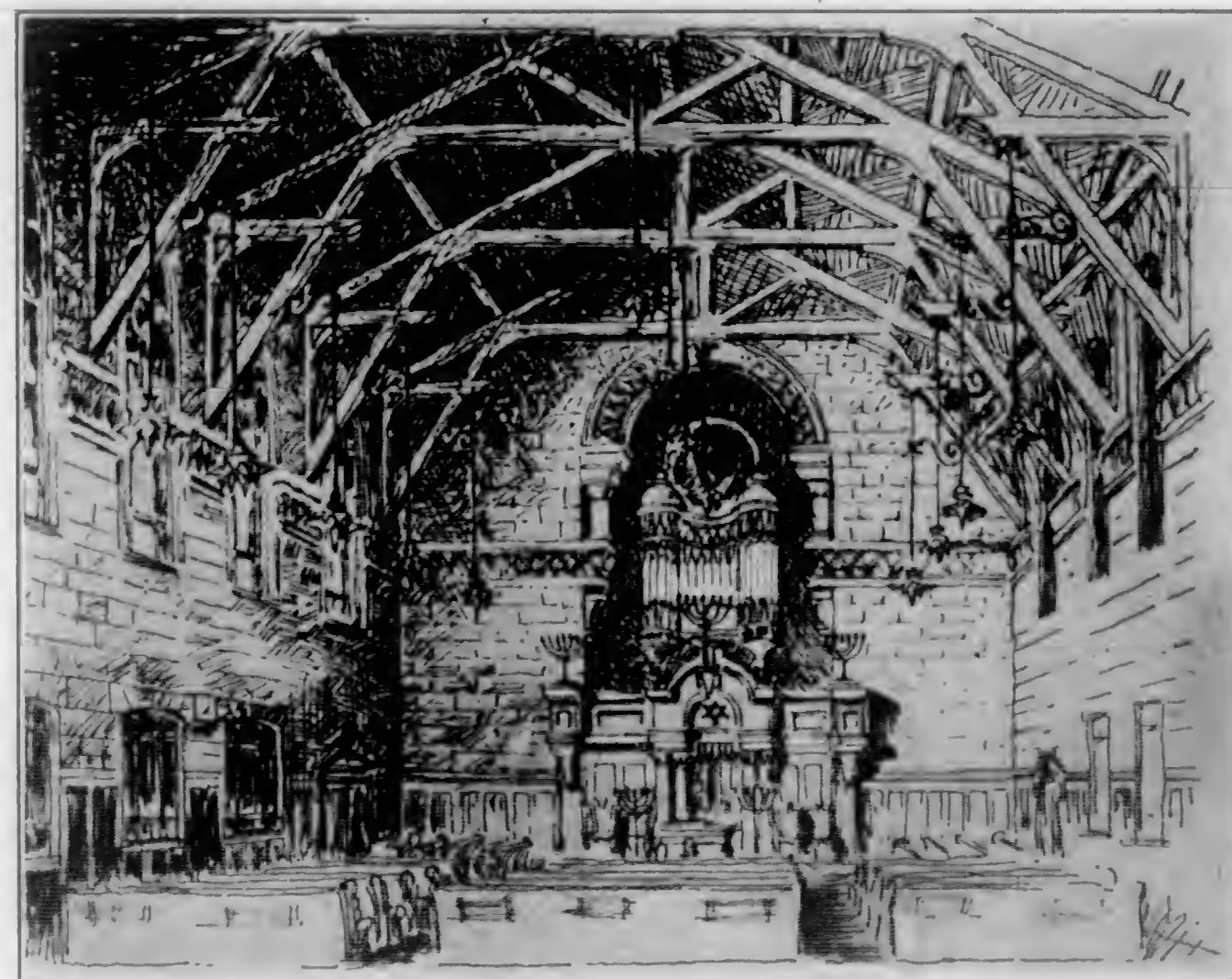
Granted that the great fire of a year ago wiped out ancient landmarks, hallowed by the consecration of time, and that structures of sentimental interest and association to the City of San Francisco are now no more, it should be understood that never again can buildings be erected which, whatever their interest from an historic point of view, would be a menace to the welfare of the community by reason of the flimsy character of the material composing them.



The Sanford Sachs Building, San Francisco
 Equipped with Otis Elevators
 Lansburgh & Joseph, Architects



Design for Restoration of the Temple Emanu-El
 Lansburgh & Joseph, Architects



Interior Temple Emanu-El
 Lansburgh & Joseph, Architects



M. A. Gunst Building, Geary and Powell Streets, San Francisco
Equipped with Otis Elevators
Lansburgh & Joseph, Architects

The lesson taught by the fire has not failed of study in this community, particularly that touching the merits of steel frame work in the construction of the modern office and public building. So it is that a vast field has been opened for this class of construction.

The steel frame withstood the earthquake and fire better than any other form of construction. The fact that reinforced concrete and good brickwork also bore up well under the stress of fire and shake has encouraged architects and owners to combine the three. Experts have declared that no better construction is possible than steel frames, concrete floors and walls and a facing of brick or tile.

Architects Lansburgh and Joseph have designed a number of steel frame buildings for the new San Francisco and they are to be erected by the James Stewart Company of New York. This company is well known all over the country as contractors of some of the world's greatest buildings. Among the number might be mentioned the Savoy Hotel.

Among the notable steel frame buildings now in course of construction by the Stewart Company is the M. A. Gunst building, a ten-story office structure at the southwest corner of Third and Mission streets. It is to be a Class A building, thoroughly modern. The facade will be of sandstone, with the intermediary panels of bronze and glass. The character of the building will be somewhat French. It will cost \$90,000.

Steel will likewise form the framework of the Sanford Sachs building on Geary street, between Stockton and Grant avenue. The front will be of semi-glazed polichrome terra cotta. The building will be ten stories high and equipped with every modern convenience for offices and sales-rooms. It will have two facades, one on Geary street and one on Union Square avenue, thus affording abundance of light. This building will cost \$175,000.

Both these buildings will have fast running elevators, and the grill work will be of elaborate design.

The new Orpheum will represent an expenditure of \$400,000. A modern, safe and comfortable play house is to ornament the site of the old theater on O'Farrell street. Steel will again loom largely in the constructor's plans, which call for a handsome building in the French Renaissance style.

The southwest corner of Geary and Powell streets will likewise exhibit the possibilities of the steel frame. Here will be erected the Elkan-Cohn-Gunst building to cost \$350,000. Class A and ten stories in height, this building will prove a source of legitimate pride to the architects, builders and owner.

The restoration of that familiar landmark on Sutter street—the Temple Emanu-El, has also been undertaken. This is to be a "rush job"—that is to say, time is the essence of the contract. The work, it is confidently anticipated, will be completed in ample time for the Jewish New Year in September.

* * *

Something New

"Anything new this morning?" said the engine dispatcher, as he leaned his back against the cylinder and steam chest for the purpose of warming his vertebral column. "Nothing," said the roundhouse foreman, "except that fresh paint you're leaning up against."—Automobile Magazine.

Recent Decisions Pertinent to Architecture and Building

AUTHORITY of Architect as Agent of Owner.—A building contract constituted the architect an arbitrator to pass upon the quality of the materials and the character of the work and to estimate the amount of work done as a basis of payment. The plaintiff had furnished materials to the contractor engaged in the construction, and in an action to enforce a mechanic's lien the owner defended upon the ground that payment had been made to the contractor. It is well established that, if the owner had knowledge that materials were being furnished by the plaintiff, payment to the contractor would be no defense. It was shown that the architect had such knowledge, and it was claimed that the same amounted to knowledge upon the part of the owner for the reason that the architect was the agent of the owner. It was held that, as the contract did not empower the architect or make it his duty to ascertain the source of materials furnished, such knowledge on his part did not bind the owner. It is elementary that the principal can be charged by the knowledge of his agent only when that knowledge is of matters pertaining to a transaction in which the agent has authority to act. *Chicago Lumber & Coal Company vs. Garner*, Supreme Court of Iowa, 109 N. W. Rep. 780.

Upon Whom Loss Falls when Building is Destroyed by Fire in the Course of Construction.—Under a building contract the owner agreed to pay to the builder the sum of \$950 when the walls should have been erected to the second story, \$1000 upon the completion of the roof and the balance in installments at certain stipulated times. After the building had been erected to the second story it was destroyed by fire, but the walls, valued at \$500, were left standing. The builder declined to go on with the work, and in an action by the owner to recover the \$950 which he had paid the question arose as to which of the parties should bear the loss caused by the fire. It was held that the builder was entitled to retain the payment which had been made on the theory that the contract for the construction of the building was not an entire contract, but a divisible one. That is to say, it was made up of a number of smaller contracts, the first contract being to raise the building to the second story. When the work was carried that far the builder had earned his first installment. If the contract price of a building is to be paid by installments on the completion of certain specified portions of the work, each installment becomes a debt due to the builder as the particular portion specified is completed. If the house is destroyed by accident the owner is bound to pay the installment then due, but he is not liable for anything upon an unfinished installment of the work. Where, however, the contract is for the completion of a building for a certain price, that is, where the contract is entire and indivisible, if the structure is accidentally destroyed before completion, and the builder, being given the opportunity, refuses to proceed further, he must refund any money which may have been paid him under the contract and is liable for damages for his breach of contract. The fact that payment is to be made in installments does not change the matter if the price is entire for a completed building, and the installments are arbitrary as to time of payment and fixed without regard to the value of any distinctive portion of the work done. *Keel vs. East Carolina Stone & Construction Company*, Supreme Court of North Carolina, 55 S. E. Rep. 826.

Right to Deposit Building Material in Street.—Persons owning property abutting upon public streets have the right to deposit material in the street necessary for the construction or repair of a building. The law justifies such obstructions of a partial and temporary character from the necessity of the case.

But the obstruction must not be unduly prolonged and the exercise of the right to deposit the material must not unnecessarily interfere with the right of the public to use the street or with the reasonable enjoyment of adjoining property by the owners. Where a person placed a large pile of brick in front of his premises, extending about thirty feet into the street, and allowed the obstruction to remain there for five or six months, he was held liable in damages to an adjacent store owner upon its being shown that as a consequence of the obstruction water accumulated in front of the store and practically destroyed its trade. *Culvertson vs. Alexander*, Supreme Court of Oklahoma, 87 Pac. Rep. 863.

Effect of not following Specifications of Building Contract Upon Right to Enforce Mechanic's Lien.—The specifications which formed part of an agreement to erect a dwelling house provided that the house should be set on "5-inch piles set 4 feet in ground." The piles were not so placed, but were set upon flat stones, the contractor testifying that he considered it "better with the flat stones." The specifications required "hip rafters, 2 inches by 10 inches," but no hip rafters were put in. The first story beams were to have been 2 inches by 10 inches, but beams 2 inches by 9 inches were used instead, because it was discovered that "they were strong enough," and there were numerous other minor variations from the plans which the contractor excused on various grounds. In an action to foreclose a mechanic's lien filed by the contractor it was held that he had not shown a substantial performance of his contract such as is essential to the right to recover. A contract is not substantially performed by substituting for that which is expressly required materials, methods or workmanship which, in the opinion of the contractor and his experts, are "just as good," unless the substitution relates to a matter of minor importance, is made in good faith and for sufficient reasons, and an adequate allowance is made for the difference. It is not sufficient for the contractor to build a house; he must build the house contracted for, and substantially comply with the specifications before he is entitled to payment. *Easthampton Lumber & Coal Company vs. Worthington*, Court of Appeals of New York, 79 N. E. Rep. 323.



*The A. A. Louderback Building at Eddy and Leavenworth Streets, San Francisco
Meyer and O'Brien, Architects*



*Stained Glass Window for a Memorial Vault, Stockton
Designed and Made by the San Francisco Art Glass Company*

Cement and Concrete

The Commercial Value of Artistic Concrete

By LOUIS H. GIBSON, Architect, in Municipal Engineering.

THE friends of the cement block are greatly pleased with the plan of the Association of American Cement Manufacturers to develop an artistic interest in cement block design. This they are doing by offering substantial prizes for designs for various kinds of small houses. There are eighteen prizes, ranging from \$200 to \$40. There are six classes, the two highest being \$200 and each of two of the others being graded down to \$40.

The program for this competition has been scattered broadcast among architects and architectural draftsmen, has been published in various architectural and engineering papers. The program was carefully prepared and will be fairly judged under the rules governing such competitions. The prizes are of sufficient value and the prestige which would result from their winning of sufficient interest to develop a sincere and active interest upon the part of a large number of architectural designers of the country. These designs will be published and be spread before all of the architects, engineers and builders of America and other English speaking nations.

It is hardly possible to anticipate the advantage which will result from this intelligent and well conceived plan upon the part of the Association of American Portland Cement Manufacturers. It will inure, not only to their benefit and to the benefit generally of cement workers all over the world, but to the manufacturers of blocking-machinery, the makers of cement blocks, as well as to the public at large.

After all it is from the public that the greatest benefit will be derived. The public buy the blocks, the manufacturer makes them; he in turn patronizes the manufacturer of the machine, and altogether this involves the use of cement. The effort on the part of the cement manufacturers, is worthy and it will develop splendid results commercially, because it will show what can be done artistically.

It can not be denied that the cement block industry has been a relative failure, largely on account of the inartistic handling of the material. There are other causes, but no matter if the cement blocks and all of them had been structurally ideal and made mechanically perfect, it yet would have been a relative failure, because of the inartistic character of the blocks and because of inartistic handling.

This competition in its results will attract the attention of architectural artists from all directions; it will be participated in by men of splendid training and adequate experience, and there will be laid before



*Stained Glass Window for a Memorial Vault, Stockton
Designed and Made by the San Francisco Art Glass Company*

Cement and Concrete

The Commercial Value of Artistic Concrete

By LOUIS H. GIBSON, Architect, in Municipal Engineering.

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the world splendid documents which will shame previous efforts in cement block design and execution. Those who have been familiar with the cement block industry from its incipency have predicted just what has happened—that is, without the touch of the artist that the business would go down. Many of us saw in the beginning that the work of making cement blocks was in bad hands, so far as the credit of that industry was concerned. Cement workers have been warned as to the position in which they were placing themselves, but in a large measure the suggestions have been disregarded. Under this new movement, however, there will be presented an object lesson of such a pronounced and startling character that there can be no escape from its teachings.

In the program for this competition the limit of cost ranges from \$2,000 to \$4,500 per house, and it will be found that there is no excuse for ugliness in a house of any sort. If any part of one of these structures can be made beautiful, all parts may be beautiful; there is no excuse for an ugly detail. The beautiful trimming of a window, a doorway, the pleasing form a string course, a well-proportioned and well-formed cornice need cost no more than the ugly form. The beautiful form involves no more of material and no more of labor in its fabrication than does a crude and ugly and common form. This relates to detail—the door, the window, the string course and other parts. Good proportion costs no more than bad proportion; good composition and arrangement of parts costs no more than a faulty, crude and common arrangement. A beautiful house need cost no more than an ugly house. In truth, there is no excuse for an ugly thing in this world. The beautiful thing is the thing in place.

By way of illustration it may be said that few of us appreciate the improvement that has been wrought in the manufacture of brick. This is not alone through the reduction of the cost or in the improvement of the ordinary form, but as well in the production of the artistic form. While most molded brick which were made a few years ago were uninteresting and often ugly, there are now those made which are truly beautiful and artistic. There is absolutely no reason why concrete forms may not be made which are as beautiful as anything that the world has ever known in architectural design. There is no reason why this should not be true; there is every reason why it has not been true. The design for cement blocks of an artistic character has not been furnished by the manufacturer. The public and the architect have asked for, have sought earnestly and eagerly good designs, and have nearly always met with discouragement. Certainly the result has been such as to drive the best builders away from the consideration of this building medium.

The example of brick manufacture was cited above. There is a certain analogy between brick design and cement block design, with the inherent advantage in favor of the cement. Because of the size of the forms and the manner in which the blocks are handled and cured, the cement block manufacturer has a more pliable medium in his hands. The larger form of the block certainly presents great advantages. Nevertheless we have beautiful designs in brick and in their decorative forms all over this country, and it is rare indeed that we can point to the beautiful buildings where cement blocks have been used: certainly few important structures in this country.

The brick-maker has in a measure blazed the trail for the cement block maker. In the early history of decorative brick-making there was somewhat of prejudice against the use of machinery in the production of things artistic. It was affirmed and believed that the artistic which was in

mind could only find adequate expression through the intervention of the tool which was in hand. Certain kinds of structural work and certain details of carving will always have to be done by hand, yet it is true that many decorative details and forms can be produced and reproduced as well through the agency of the machine as through the agency of the hand. It is the artistic impulse of the mind, guiding the hand, which produces the result. Why may it not be true that the same artistic impulse and the same mind which guided the hand may also design and guide the work of the machine. The form which the machine produces may be designed by a great artist. A great artist may model and execute the original design. This may be used in the formation of the matrix through which his artistic design may be produced and reproduced in concrete by the hundred, the thousand or more. Some years ago a Boston manufacturer of molded brick employed Mr. Evans, a distinguished sculptor of architectural decoration, to design for his firm certain forms to be molded in brick. Mr. Evans had formerly been doing a great deal of work for H. H. Richardson, the architect; he did the carving on what was then the New Brattle Street Church in Boston, the Trinity Church. He did much work on the City Hall in Albany and on the New York State Capitol, and elsewhere where Mr. Richardson was engaged as the architect. Through the medium of Mr. Evans, the artist, the first artistic molded brick-work was done in this country, and being artistic it added large value to the raw material, the clay, and was a great commercial success. Through the medium of Mr. Evans' art and the inventive, mechanical and business ability of the manufacturers a great and successful business was built up. It is very probable that had Mr. Evans gone into the brick business he would not have made a commercial success of it, and it is equally certain that had these manufacturers depended upon their own artistic impulse or capacity to design the beautiful forms, they would have failed in this part of their undertaking, and in so far as their success was dependent upon the public demand for the beautiful, they too would have failed. Through one medium or another the manufacturers of ornamental brick have pursued a similar course, and the measure of their success has been very largely determined by the quality of the artist. There had to be a business ability, but no amount of understanding or commercial energy will take the place of or supplant the weakness of inferior designs; both are necessary. Mr. Evans was responsible for the work of the machine, in so far as the machine produced an artistic result. The machine produced an expression of the individuality of Mr. Evans.

It would be difficult to justly estimate the commercial value of Mr. Evans' art to manufacturers of this product. It has absolutely enlivened all the capital invested in their business for these many years. It has made a live profitable asset out of what might have been a dead one.

We must not discount the art of the machine. In a measure every bit of bronze sculptural work is dependent upon a mechanical process. It is a machine product. To be sure there is the design of the artist, but the final realization of his design, its final expression in material, is dependent upon a mechanical process. He designs a bit of statuary, he models it, he expresses the best there is in him through the medium of the clay; and from the model a mold is made and the figure is cast. The making of the mold and the casting of the figure are in principle no more or no less mechanical than the making of the mold for the brick which are decorative, and it is no more or no less mechanical in either case, whether there is one

brick or one statue or a thousand. The last one of a hundred thousand of brick or statuary is dependent only on the original impulse of the artist and the mechanical perfection of the operation. This illustration is given at this length for the purpose of inducing greater respect than many of us have for a mechanical process as related to things artistic. No artist could personally execute all of his work on a building. Mr. Evans probably had men working for him, handling the chisel and the hammer, when he was decorating Mr. Richardson's buildings, who had little, if any, more artistic impulse than the machine which made the brick.

The concrete block makers of America have been undertaking to fly commercially with one wing. Many of them are possessed with the business instinct, certainly with a business ambition, though one can recall instances where even the business wing was shy on prominent feathers or badly clipped. The concrete block industry must have two wings in order to fly; there must be the wing of the artist and the wing of the business; it makes no difference which one is short, either deficiency will cause failure.

The concrete block maker has proved his own deficiency. He has been trying to fly on one wing long enough. He has his hands full in developing the wing of mere business. This involves primarily mechanical excellence. He certainly must have assured himself by this time that in order to sell his product it must be well made from the manufacturer's point of view. The artistic point of view may be never so strong, nor so nicely developed, but that is dependent upon the other for successful venture before the public. The artist furnishes the design for the form; it is for the manufacturer to properly materialize the idea. There must be the surface, the texture and the color as related to the visible part of the product, and there must be the density and stability as related to the body of the block.

It unfortunately happens that the same quality of workmanship and the same intelligently expressed ideas of composition of the concrete itself, that will produce a solid and relatively impervious block, will in a large measure produce the pleasing surface and the artistic texture. An adequate handicraft is essential to the realization and materialization of the artistic impulse.

The great practical fault which one finds with the average concrete block is its pasty texture, owing to a superabundance of cement, and its dull, leaden color, owing not only to a superabundance of cement, but to the character and quantity of the aggregate, the inert material, which has so much to do with the texture of the surface. In a previous article this matter was treated at length, and it was stated that there was a normal concrete, a mixture which realized the full strength and efficiency of the combined materials. This article considered concrete from the structural point of view. It affirmed that it was first desirable to so compose the aggregate, by determining tests, that the voids would be reduced to a minimum, and then to add only so much cement as would surely fill the voids. This makes the strongest concrete, the best concrete structurally, and in so doing it presents the most beautiful surface that is possible with the materials involved. The beautiful texture may be secured by the same means that will produce the strongest substance. The ideal texture is that where the particles of aggregate are practically exposed, and where there is only a sufficiency of cement on the surface to cause the particles of the aggregate to adhere—simply this and nothing more.

Texture is one thing and color is another. A light colored surface,

either a buff or gray, in any of its tones, can not be secured with muddy colored aggregate, or dark or leaden colored cements. Many cements are not suited to the production of the artistic block. Many of the cements on the market, however strong they may be, are absolutely deadening in their color influence. It is true that certain pigments may be used for the purpose of securing various colors, but they must always be for the color or tone darker than the cement itself. One may secure a lighter color effect by using a light aggregate, but with certain grades of cement there are certain deadening qualities in color influence which can not be eradicated. The best color effects which may be secured by the aid of pigments will begin with the lightest possible color of both cement and aggregate.

While we are hardly far enough advanced at this time in the manufacture of concrete blocks to consider very seriously or accurately the use of artificial coloring material, it may be well to know what can be done in this way. A few years ago the writer while in Havana, lived in a room where there was a beautiful concrete floor with a many-colored border running around the room, and a beautiful center-piece and figures disposed on the body of the floor. The design was artistic, the colors were clear, bright and sharply defined, and the workmanship was superb. Floors of this kind are by no means uncommon. The cement which one sees used in this section, and which was used under the Spanish rule, was very light in color, not to say white, but such as would produce a surface of about the same color and texture as light sand- or oolitic-stone. With this light cement the colors could be graded and at the same time preserve their sharpness of tone and quality. We all call to mind that ordinarily, when we undertake to color cement for a sidewalk, we invariably get a dull, heavy, leaden quality, owing to the color of the cement and the aggregate.

There has recently been placed on the market a cement which is all but white in color, though it is tinged by a warmth which, when combined with the ordinary clean, sharp sand, yields a color of about the same quality as that of the most sought-for light building stone. This cement, when combined with varying aggregates, will always give a rich tone, and when properly combined as to quantity will yield a splendid artistic texture. Not enough attention has been paid to the selection of cement for the production of artistic results in connection with cement block work. The base we will find must be a lighter colored cement and then the gradations of color or tone may be made through the aggregate or pigments. The sharpness, crispness or color and texture can only be properly maintained with a cement base of light color.

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The Growth of Concrete Construction

IT HAS been the conviction of those who have noted the increasing use of cement in the past twelve months that the current year would witness a great advance in this direction, but present indications point to a much more extended application, especially in the form of concrete, than the most sanguine anticipated. From every section of the country come reports of building operations involving the use of concrete. The list includes practically every branch of construction. In many instances, brick walls or facings of brick and stone are specified, but in a majority of cases where large structures are planned, concrete is to be an important factor.

On the Pacific Coast, especially in California, the number of concrete buildings planned or under way is conspicuously large. In that locality, as in other sections of the country, concrete has made remarkable progress in popular favor in spite of failures here and there, the antagonism of trades unions and the opposition of influences concerned in the future of the materials with which concrete comes into direct competition.

Concrete foundations, cage construction, bridges and dams comprise an old story if considered from the standpoint of extended use instead of time, but from its application in these and kindred projects there has been remarkable expansion. A matter worthy of special note is the fact that there is now general recognition of the value of concrete for every type of building in which the contents or manufacturing processes may have to do with sanitary considerations and the life of the structure. That is to say, buildings in which meats, fruits and other foods are prepared or stored, or in which chemicals are used. In all structures of this character, concrete is regarded as an economical and sanitary substitute for materials subject to rust and decay.

In the way of more recent uses of concrete may be mentioned the railroad tie, telegraph and telephone poles, flooring in steel cars, mine supports, shingles, doors, window sash and fencing. The list extends from the ordinary to the most novel applications, such as the stoppage of leaks in vessels and the filling of trunks of decaying trees. In many operations where mechanical devices or human hands could not work with other materials, cement and concrete have solved vexing engineering problems and saved the day in important enterprises. In brief, if we were to put aside every type of concrete construction now the subject of controversy and consider only that which time and experience have demonstrated to be absolutely practical and economical, the volume would still be enormous.—Cement Age.

* * *

Better Fire-Prevention

AN INTERESTING change in the policy of the big monthly publications is most noticeable. Where most of the space was formerly given to fiction and travel a great proportion today is used in the discussion of lively and timely topics, and those journals are fast becoming real molders of public opinion and a potent power in the reform of abuses, popular follies, etc.

Advance sheets of the Metropolitan Magazine for May illustrate that point most thoroughly. One of the leading articles, instead of being romance or a story of conquest, is a most able paper on "Fire-prevention", something about which, judging from our terrific fires, our people are in sore need of instruction. The editor prefaces this article by saying: "In the matter of fire losses we lead the world. The question naturally arises: Are our great losses due to careless preventive measures? Have you ever seen your office or your home with your treasured possessions totally destroyed by flames? Do you want such an experience? Perhaps you think you are careful. The maximum cost of fire destruction in all European countries is less than one-sixth as much as in our own country. This article, by an expert, discusses the situation and suggests the common sense preventives."

The article is by Architect F. W. Fitzpatrick, of Washington, the Executive Officer of an international society having for its members the Building Inspectors of the world. He is well known to readers of this magazine, having contributed a number of timely articles on fireproof construction.



Design for a Concrete Residence. Squires & Wynkoop, Architects

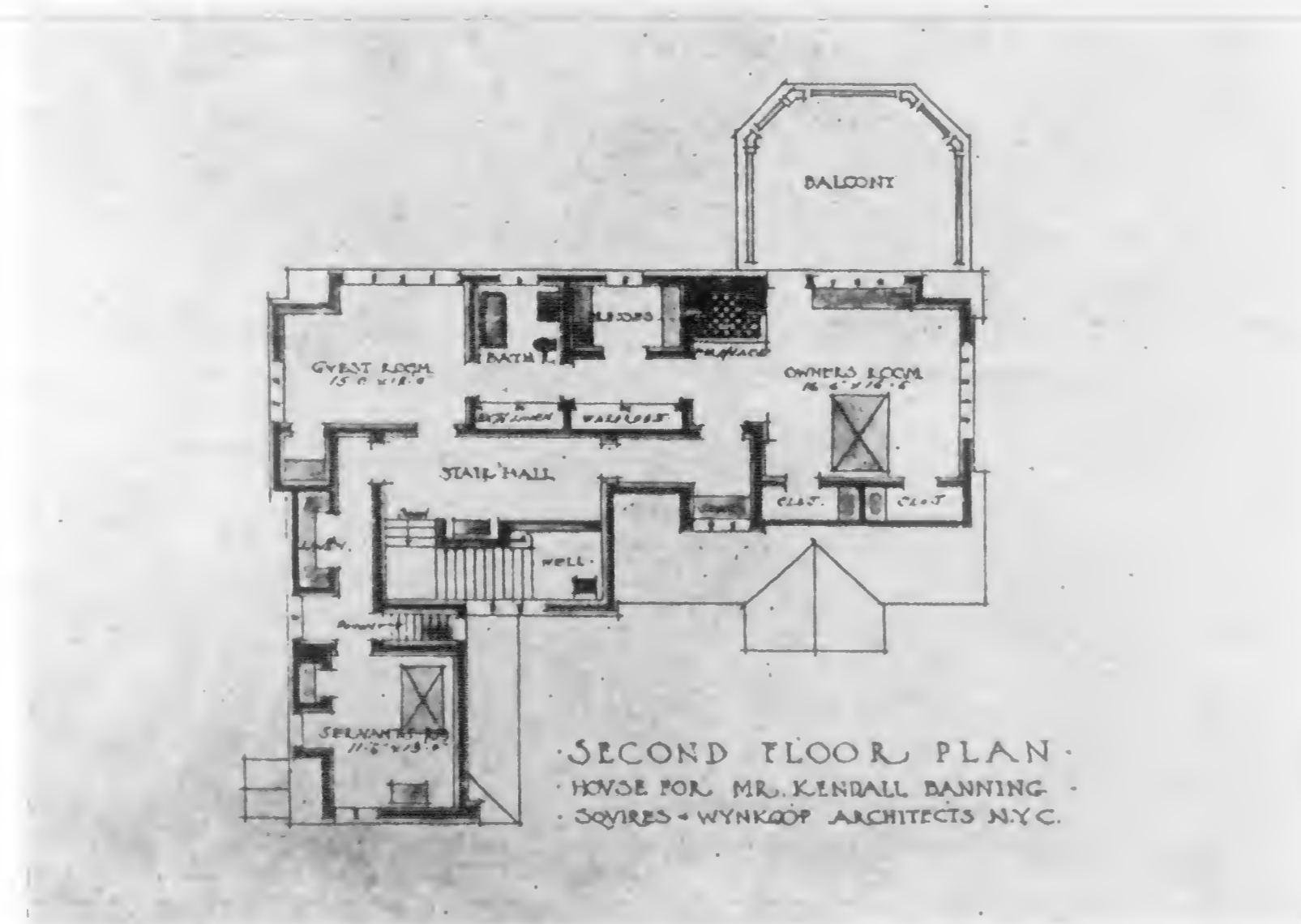
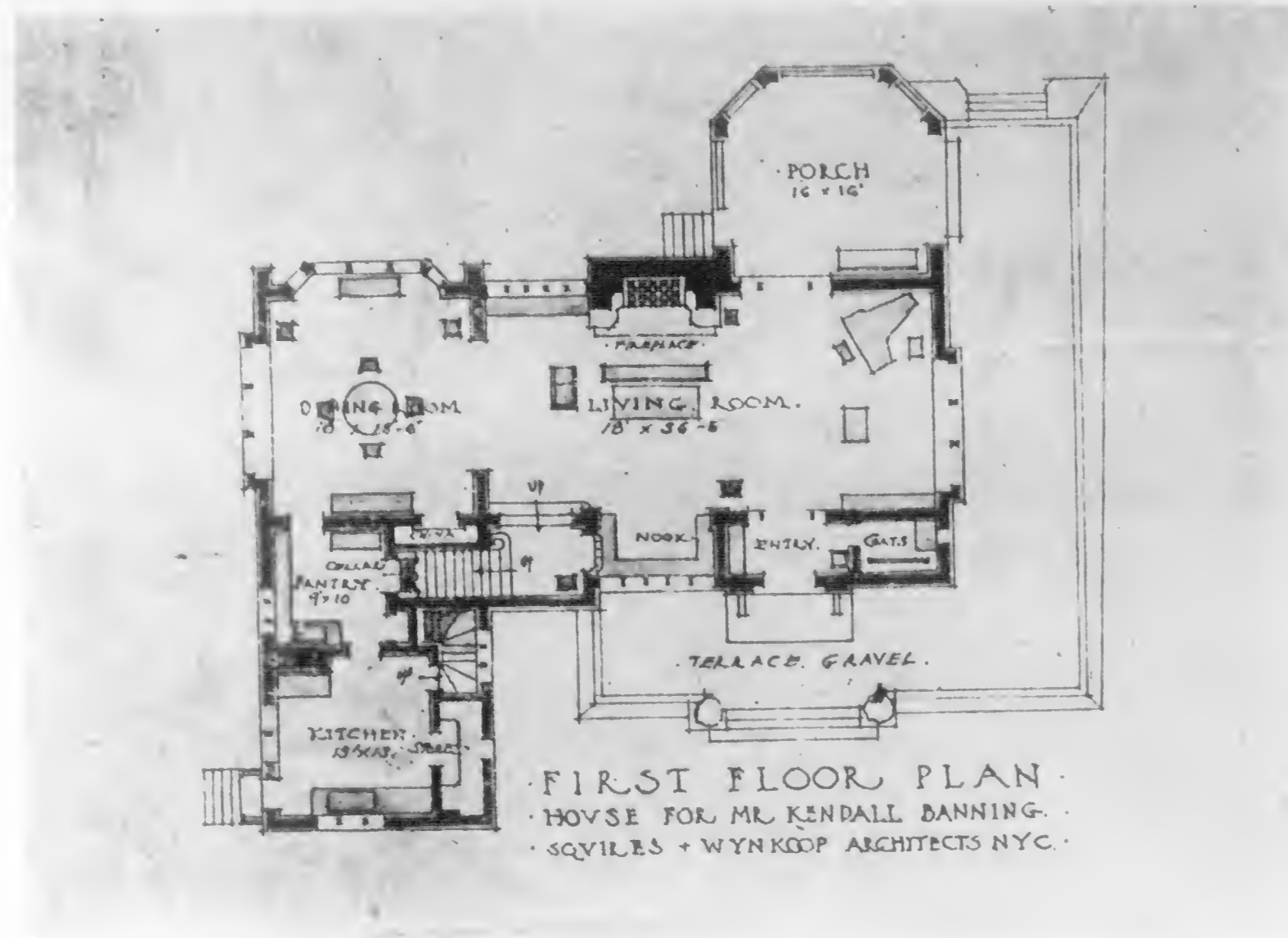
The Use of Concrete for Cottage Building

The Right and Wrong Principles in the Design and Construction of Concrete for Residence Construction.

By DAVID L. LAY

BACK of beauty is the cry against concrete houses today. Whatever truth there is in such accusation is the fault rather of the users than the material. Concrete first recommended itself on account of its utility. This side has been pushed in many instances to the neglect of its artistic possibilities. Apart from its commercial side, the use of concrete has been largely confined to small houses and those where the tastes of the owners have not called into play serious architectural effort. The result has been that many of those who have designed in it have been untrained and inexperienced. They have produced only some very crude buildings but have fallen into the usual error of the tyro—that of imitation in concrete of other materials. This accounts for many crudities in appearance and has led to the most common fault of the unimaginative, that is, imitation of the effects of other materials.

The true artist designs in a way characteristic of the natural material which is under his hand. He tries to make his building tell the truth. Strange as it may seem, by so doing he accomplishes the most beautiful results. Art is long and an imitation cannot stand the test of time. The designer who imitates a Gothic stone building in wood or a stone cornice in metal, sanded and marked off with false stone joints, would accomplish something more worthy of his calling if he expended the same amount of ingenuity in trying to produce a wooden design that looked like nothing but wood or a metal cornice that was characteristically metal. He would also stand a better chance of doing something artistic.



Concrete has come to stay. It has to be reckoned with in design as well as construction. It requires then a concrete architecture characteristically its own. It needs an art of concrete. We have tried to show that to be artistic it must be truthful and this precludes imitation. The nature of concrete leads to its use in large flat wall spaces. That such may be treated artistically has been proved by the stucco work in the half timbered houses of England and Normandy and more strikingly in the old palaces and churches of Spain, and in the missions of Mexico and California which they have inspired. They teach many interesting lessons in mass and color treatment, yet concrete should not copy them because they are stucco and adobe. Concrete is a finer and more structural material.

The illustration shows a step in the right direction. It is a characteristic concrete house, yet it is evident that it was studied with the idea of attaining a beautiful result. Nothing is imitated. The elevation is a truthful expression of the plan. Both have been studied with the idea of concrete in mind. The result is broad wall surfaces and a few simple openings. The gables are interesting in outline, especially the largest one, and the whole mass is picturesque.

The soberness of the masonry both in design and color places the lively and brilliant roofs in contrast. The decorative spots made by the wood work are happily chosen, especially the quaint little hooded entrance at the end of the long roof line. One can imagine bright flowers in the windows and along the terrace.

The little house has used the material honestly, it has taken advantage of the possibilities, while it has never tried to overstep its limitations and in every point has made a quiet effort after taste and charm. It marks a step forward in art in concrete.—Cement Age.

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Concrete Failures

By THOMAS POTTER, in the Builders' Journal and Architectural Engineer

CONCRETE work, like most other building processes, is subject to failure when composed of unsuitable materials, dealt with under improper conditions, or executed by incapable workmen, under inexperienced surveillance, and when any or all of these occur the cause is not very difficult to trace.

Many failures are not of a serious nature; they attract little attention, and are known only to those immediately concerned; others of greater magnitude we probably hear nothing about; it is against the interest of all employed or interested therein to make such matters public if they can be avoided, as in the case of the serious ceiling and floor failures lately at the Bexley Heath Asylum, which occurred after having been completed five years, the cause of which is unknown to the general public.

It is only when a coroner's inquest becomes necessary that the circumstances connected with concrete floor, roof, and other failures, are made known through the press that we learn particulars that can throw light upon the cause and the result, as in the case of the Orchard street accident in 1898, when seven workmen lost their lives through the collapse of concrete roofs and floors. Even where there is evidence of failures that can apparently be easily remedied, it may happen that the remedies are not of a permanent character, as, for instance, when they arise from the use of an inferior or unseasoned cement, no care having been bestowed as to its soundness and fitness for the purpose, the results arising from the chemical action of the constituents of which Port-

land cement is made are undetermined for two years at least after its use, and in some cases probably much longer.

In the choice of an aggregate for concrete there is usually but little scope; local facilities usually govern the selection, but, as before explained, there are certain conditions to be guarded against which otherwise may lead to failure, as, for instance, sulphur in unacrated slag from iron ore, and in cinders from certain chemical works, half burned limestone, chippings, accidentally mixed with locomotive ashes, unslaked lime core refuse from plasterers' mortar, and other materials which will expand when water is added to them, the remedy for which is careful examination, and, if possible, exposure to the atmosphere and rain for as long as circumstances permit. Where water is abundant the aggregate should be well saturated, which will help to slake any portions that may be inclined to swell, or that have escaped observation. It is a difficult matter to judge by appearance exactly the nature of aggregates, and for town buildings where no room for storing exists, but where delivery has to be day by day, it has in a large measure to be taken on trust.

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The primary cause of most concrete failures is the nature of the matrix—now almost invariably Portland cement—and unfortunately the latter is one of the few building materials that cannot be judged to any extent by the most skilled expert from a cursory examination. Color and weight were formerly held to be two features from which its character might approximately be estimated, but these are quite uncertain factors at the present time; fineness can be more readily ascertained, but this is insufficient evidence of quality; a bad cement can be ground as fine as a good one. Unfortunately, too, a fair estimate of its strength and quality can only be arrived at when tested after an interval of at least seven days, and, better still, fourteen or twenty-one days as being more reliable.

In large towns, where users of cement are unable for want of storage room, to stock any quantity, and where it is often required miles distant from their works, there is a saving of cost in cartage and unloading and reloading in having it direct from the manufacturers, or from one or other of their depots or agents, and as the available space on new buildings is usually too restricted to store any quantity to season, it is frequently the case that cement is used immediately after or within a very limited period of its delivery.

It would seem possible to have ties so made as to render it a difficult matter to tamper with the contents of the sacks without detection, as, for instance, ties with a colored thread interwoven therewith, as is practiced—for identification—with government rope. Some manufacturers now seal the ties, but something more simple seems desirable. Builders' merchants' clerks and storekeepers are often credited with "ringing the changes" when a certain brand of cement is inquired for and is not in stock, presumably in the interest of their employers, who possibly are unaware of what has been done. On one occasion, noticing a plasterer cementing the outside of a house, I inquired whose cement he was using, and he replied A's, but he added, "I have had some delivered this morning in A's sacks which I feel sure is not A's cement." When the building was finished the tint of some portions was very different to others, to the plasterer's disgust.

Another difficulty with the use of cement may lead to failure is that some manufacturers profess to make several qualities. This is a reprehensible custom. Wherever cement is used, and for whatever object, it is for some purpose where lime mortar is assumed to be not good enough, and upon the use of which great reliance has to be placed; the object is clear to everyone; cutting contracts necessitate cheap materials; one firm of manufacturers, and possibly

others, state in their trade lists that they supply three qualities of cement—"first second and contractors'" qualities. The latter description is a libel on contractors who purchase the best.

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Now that Portland cement is largely employed all over the country, and is usually received from the manufacturers, their agents, or builders' merchants in small quantities at a time, it is impossible for the user to test, or have tested, each consignment as delivered. It would be interesting to learn how many cement testing machines and apparatus are employed by the users of cement on buildings, and for other purposes, or how many builders test their cement; the number of the latter would be out of all proportion to the number who do not.

In the larger class of buildings the clerk of works has ample duties to perform without testing cement, and it would seem to most people to be unnecessary to employ a man specially experienced in that direction, and so where it is supposed to be practiced it is more often than otherwise a spasmodic operation.

Where large engineering operations are in progress it is a different matter; testing cement is usually an important factor in the carrying out of the works.

So that it becomes difficult in a general way to ascertain whether the cement we are using is up to standard requirements or otherwise, and when we realize the confidence that has to be placed in its quality, and the possible fatal results which may occur from its failure, it is a serious matter to have to deal with.

The only way to insure comparatively safe results is for manufacturers to test each batch of cement, say, seven or fourteen days after it comes from the grinding mills, bag it up with some form of fastening that cannot be tampered with without detection, and send a copy of the test signed by the works' chemist with each consignment. Some firms are now practicing this arrangement, and it would seem desirable that with a material so difficult to deal with, like some other articles of commerce, its description should be made compulsory; the best makers should raise no objection—on the contrary, for it would weed the market of much of the cement with which no guarantee is given or expected, the only recommendation being the price.

With the perfected machinery for making cement and the aid of skilled chemists there should be no reason for making an inferior quality, assuming that the raw materials are of the proper description, except the saving in cost, which is out of all proportion to the difference in quality. Then there is the possibility of the inferior kinds being put into sacks branded as best, if branded at all—may be inadvertently; but where the same article is made in the same building, though of various qualities, and undistinguishable one from the other, the danger exists. That others beside the purchaser may not be aware of the quality it is sometimes the custom to give fanciful names to the different kinds, which are branded on the sacks, such as "Cyclops cement," "Leviathan cement," etc.

If the sacks were simply branded 1, 2, and 3, denoting first, second and third qualities, the meaning would soon be clear to other people besides the seller and purchaser.

There has been no end of varying opinions relative to the contraction and expansion of concrete. It may be safely assumed, I think, that the aggregate alone undergoes no change; possibly the addition of water may cause expansion in certain aggregates to an unmeasurable extent. Cement, on the other hand, usually expands slightly, and so therefore must concrete, unless we assume that its particles undergo slight compression arising from the action of the cement, and which is not improbable.

But with unseasoned and ill-conditioned cement there is no limit to the mischief of which it may be the cause, both to concrete and to brick walls built with cement mortar. It will fracture brick and stone walls up to two years after completion, and possibly longer—the former is within my knowledge. When the walls of buildings have been erected with cement mortar and the floors are concrete, the cement for the latter being of a suitable description and the cement of the former the reverse (failures of this kind have occurred), the result is invariably put down to expansion of the concrete, and the floor contractor possibly becomes an innocent victim to damages.

If, however, the cement were of the same inferior quality for both walls and floors, the failure is obviously increased, as the latter assists in straining the walls or lifting the bricks off their bed. In walls of this character where there are possibly no concrete floors and vertical cracks occur, more generally near the ends, or adjacent to windows or door openings, where there is the least resistance, the foundations at these points are sometimes assumed to have sunk and underpinning has taken place.

* * *

In describing the cause of failure and the results, where expansion takes place, I admit that the general opinion is not altogether, if at all, the same as my own, but I am telling what has come under my own observation on numerous occasions for many years past, and not voicing the possibly general opinion.

Where large concrete floors are formed the expansion, if ever so minute, should be seen in the mortar joints of the walls upon which the floors bear, but I have never found this to be the case where proper cement was employed; the most satisfactory trial of the kind in my own experience was with a number of floors 120 feet in length and 26 feet in width; some were formed between steel joists four feet apart, others rested on dwarf walls, and not the slightest sign of expansion was apparent four years after in any of these floors.

Where unseasoned cement has been used for floors and flat roofs expansion may not develop for months, or even for years, for the action of cement is very erratic, and often not easy of explanation.

The conclusion I arrive at is—and I find it coincides with the opinion of others who have had much practical experience with concrete—that the latter expands slightly when first deposited in place, but that when the permanent set of the cement has taken place, say within 48 hours, it ceases, and as a large floor is usually some time in hand the bulk of the concrete has passed beyond the expansion stage before it is completed. How long it is before contraction takes place seems to be very uncertain, and when it does it is usually not of a serious character, unless mosaic or terrazzo is attached thereto. In many instances no contraction has been apparent at any time. These deductions are made on the assumption that the cement is suitable and the concrete is not exposed to climatic changes.

* * *

Drawing the Line

Architect—"And about the drawing-room, sir?"

Newrich—"Now, look 'ere, I've let yer put in a billiard room when I can't play billiards, and a reading room when I don't like reading; but when it comes to putting in a drawing-room, when I can't draw a line, I object. It's a bit too thick; I want a house, not a home for artists."—Carpenter and Builder.

* * *

Don't grumble if you don't get as good results from old material as from new.

Heating, Lighting and Electrical Work

Domestic Gas Lighting from the Fixture Manufacturers Standpoint*

By L. R. HOPTON

THE first gas fixture may possibly be considered to have been the bladder full of gas which William Murdock, of Cornwall, England, lighted one evening in the year 1792 for the edification of a few invited guests. Developed first in England and introduced in this country by David Melville, of Newport, R. I., in 1806, gas as used for lighting has enjoyed a steady development. The earlier gas fixtures were curious structures, and being made before the appearance of iron pipe, were both expensive and cumbersome.

It is not my purpose to go to any further length into the early history of the gas fixture, but I do wish to emphasize the fact that as the use of gas for illuminating purposes became more general the gas fixture continued to enjoy a fairly steady development, both in workmanship and in artistic merit. With the advent of the electric lamp, however, the development of gas fixtures received a remarkable quietus, notwithstanding the fact that for a short period electric lamps were used largely as attachments to existing gas fixtures. In the case of the electric lamp this transition period did not last very long, so that in a few years manufacturers were called upon to turn their best skill and expend their best possible workmanship on the construction of fixtures for use with the electric lamp. While this may be only what should have been looked for in view of the many advantages of the electric lamp, to the man interested in gas fixtures it is not very consoling to know that over three-fourths of the fixtures put upon the market today having any claims to artistic merit are adapted to the use of electricity only. The introduction of the Welsbach mantle brought about a new condition of things. It has been said that the mantle saved gas from passing into oblivion from the field of illumination. While this is, of course, an exaggeration, it certainly gave gas lighting a very pronounced stimulus. Like its predecessor, the electric lamp, the first appliances for use with the mantle were crude and unsatisfactory, but they were sufficient to demonstrate the great possibility of this form of lighting from an economical point of view.

I cannot summarize this portion of my talk better than to say that we have before us two truths that may be taken to be self-evident. The first one is, that gas for lighting cannot be made as convenient nor as artistic as can electricity. The ready means of control by switches at remote

* Read before the National Commercial Gas Association. Mr. Horton is Superintendent of the Gas Company, New York and San Francisco.

distances and the absence of any grade of combustion, render the electric lamp of particular value as a lighting medium. Gas lights cannot be used to produce the beautiful effects obtained by embedding the electric lamp in ceiling and cornice decorations, nor can they be used in many of the elaborate concealed light effects. Proper disposition of the heat from a gas light must be carefully considered; and notwithstanding the spark lighting attachment, the pneumatic valve, or the self-lighting mantle, there is no device for lighting gas as readily as the electric lamp. In short, fixtures can be designed and effects produced that are absolutely impossible in gas lighting.

The second axiom is, that the electric light, candle power for candle power is more expensive than the incandescent gas light. Electricity must be generated by means of a steam boiler, engine and dynamo, while gas is generated from coal or other materials and used directly as a fuel to produce light. For domestic purposes the electric light costs anywhere from 0.5 cent to 1.5 cent per 16 candle power per hour, while the mantle gas light costs about 0.1 of a cent per hour for the same unit. I am well aware of the rapid strides being made by inventors of electric lamps and noticed particularly a very optimistic opinion expressed by Mr. Lansingh in a paper read before the American Gas Institute at Chicago last October. He states as follows:

"During the past year the situation from the electric standpoint has materially altered; there has been, in many cases, a reduction of rates, often of a more sweeping nature than corresponding reductions in gas, but the principal change has been in the introduction of new lamps of higher efficiency. The first lamp of this nature to appear on the market was the Gem or high efficiency type, consuming $2\frac{1}{2}$ watts per horizontal candle power. This was followed by the Tantalum lamp, consuming 2 watts per candle power; and the electric industry is looking forward to the introduction of a new style of lamp, the Tungsten, which is promised for the market at $1\frac{1}{4}$ watts per candle power. Other types of lamps, such as the Osram, Ossium, Zirconium, Kuzel, etc., give promise of even higher efficiencies, and it is confidently expected by the electric trade that within two or three years there will be lamps on the market with an efficiency of perhaps $\frac{1}{2}$ watt per candle or 1-7 of the present $3\frac{1}{2}$ watt standard. Granting, however, that for some time to come, the $1\frac{1}{4}$ watt lamp will be as high an efficiency as will be attained in commercial practice, we see that the electric man will be able to reduce his current consumption from $3\frac{1}{2}$ to $1\frac{1}{4}$ watts per candle or a reduction of nearly 2-3 of the present cost. We therefore see that with the introduction of a lamp of this type, gas will be placed in the same position, perhaps not quite as good, as it was when we had only the old type of burner and the old 4 watt incandescent lamp. The cost of electric lighting then will not be greater than $1\frac{1}{2}$ times that of gas and with a possible reduction to equal or even lower cost."

Notwithstanding these interesting arguments, it may safely be stated that the incandescent gas light is very much cheaper than the electric lamp. Of course, there are favorable locations near abundant



water power, where electricity in cost may come into closer competition with gas, but on the other hand, there are locations where nature has given the gas man an abundant supply of gas, which he can secure by merely drilling into the ground and piping. In general, it may be said that we face these two conditions: The greater adaptability of the electric light and the greater economy of the gas light. While the gas appliance man has doubtless made the most of his advantage in low cost of lighting, I hope to show that he has not gone as far as possible in the other direction, namely, the increasing of the scope and attractiveness of gas lighting.

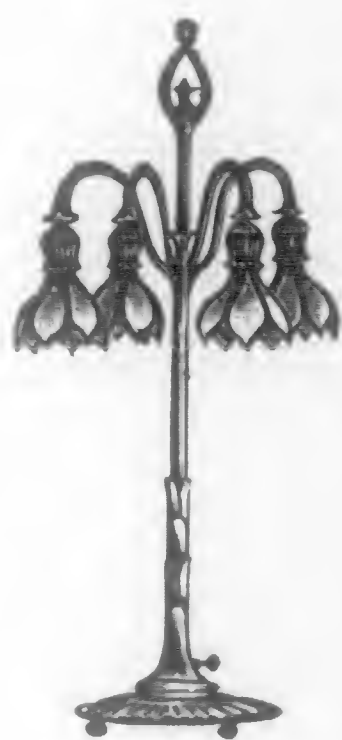
No one knows better than yourselves the limitations of your particular fields and the needs and sectional peculiarities of the public that you aim to serve; but while each of you cater to a small section or coterie, the manufacturer of fixtures on a large scale is in touch with the needs and special requirements of all parts of the country. By our contact, not only the buying public, but with decorators and architects, we are perhaps in a position to obtain a broader view of the situation, and to see a phase of the field of gas illumination that is not accessible to the gas appliance man. We know with what aversion a large portion of the public treats anything in the way of gas fixtures. We are constantly reminded that decorators look on them as things to be avoided, and that many architects advise against them wherever possible; and this aversion exists in the fact of increasing cost of installation, by reason of the more rigid requirements on the part of the Boards of Fire Underwriters.

While this state of feeling is principally due to the pronounced advantages of the electric light, it is also fostered in large measure by the way in which gas lighting is being handled today. To these people of refinement, gas lighting is associated with the ugly fixtures, crude and unfinished attachments, and all manner of inconveniences. They will cheerfully have their houses piped for gas ranges and water heaters, but are willing to pay much more for electric wiring for the use of electric lighting fixtures. Of course, this condition does not work disadvantageously to the interests of the large fixture manufacturer. He is equipped to make any style of lighting fixture that may be called for; but to the man interested in gas fixtures and the more general use of gas for illumination, it is a situation that must be seriously considered. Notwithstanding the fact that both electricity and gas are frequently furnished by a single company, there exists a natural rivalry between the appliance men in the two departments, and the gas appliance man must do all in his power to build and maintain his department. In cases where there is keen competition, such as exists in many Western cities, it is of still more importance that the gas appliance man do all in his power to overcome this aversion on the part of the public to the use of gas for illumination.

It seems to me that the general public may be divided in three fairly well defined classes regarding their attitude toward the question of lighting: The first class may comprise that large portion of the public which considers but two things, candle power and cost, and by cost I



mean not only first cost, but also the cost of operating and maintaining the fixture or burner. To this class may be assigned all store and shop lighting, where arcs and other high candle power units are more commonly used. It may be natural to suppose that in such cases the lighting fixture is considered as a necessary mechanical appliance, useful for the few hours that it is lighted, and during this time expected to produce most economic results, but a bothersome and obstructive piece of mechanism during the many hours that it is out of commission. While some attempt has thus far been made to construct these high power gas appliances more ornamental, it is interesting to observe the form in which the electric arc lights are being used in some of New York's largest retail stores. They are attractive and in harmony with other decorations, and



the effect is noteworthy. The gas arc has a large field of usefulness and has certainly been a boon to gas companies and appliance men. While from the standpoint of scientifically correct illumination it is questionable whether it is best to group the light into single high power units, the fact remains that as a companion or substitute of the electric arc light it has a large and growing field. In this class also should be included a large portion of the public who are interested in domestic lighting, and who are largely the buyers of the cheapest fixtures and single burners. Attracted by some advertisement or impressed by the light-giving qualities of some type of burner, they aim to get light, and lots of it. They want as much light as possible in one burner, want it with the consumption of little gas, and seem to be perfectly willing to sacrifice simplicity of construction and neatness of appearance to this end. These people care little if the burner has a Bunsen tube 3 or 4 inches long and will load it up with chimneys, reflectors, diffusing cups and metal

work, if by so doing they can increase the light. They will put on a neat and well appearing chandelier a single powerful burner and use it for the entire illumination of a room. With people of this class, the fixture manufacturer rarely comes into direct contact. They buy their fixtures and their burners from supply dealers and from the gas company stores; and their purchases form a large portion of your business.

A second class we might consider is the large and fortunately growing portion of the public, which considers appearance and workmanship as well as candle power and cost. People of this class exercise greater care in the selection of their fixtures and burners and desire them to be of good workmanship and as attractive in appearance as possible. They desire a better distribution of light and prefer to use a smaller number of units on their fixtures, even though the first cost and the cost of maintenance are a little more. While they are not always satisfied with the attachments necessary for good illumination, they secure the best they can, and desire these appliances to match the fixture in finish and glassware. Many of these customers are sent to you by buyers and architects and they generally invite your aid in making their selections.

In still a third class may be considered that portion of the public which considers candle power and cost of secondary importance and attaches the greatest importance to the decorative and harmonious appearance of the fixtures. The gas appliance man does not, as a rule, come in contact

with this class, as these people generally use electricity for lighting and buy principally from the manufacturers, in consultation with their decorators and architects. To them the lighting fixtures must be an ornament, and one that is in absolute accord with their scheme of decoration. They are willing to pay a good price for the fixtures that meet their fancy, but are critical in their selection and exacting in their requirements. There are numerous cases where people of this class have elected to use gas for illuminating purposes, and for them some really beautiful and interesting effects have been produced.

And now having touched upon the history of the case and having analyzed the symptoms, let us proceed to prescribe a remedy.

First—Equip your departments to properly sell gas fixtures. While this remedy is more applicable in some cases than in others, a majority of appliance departments are not equipped to properly handle this portion of their business. Generally the salesmen are not trained to sell fixtures. It takes years to make a first-class fixture salesman to sell fine goods, yet the selling of gas fixtures is left to clerks, or others equally unfit, who can recite without a pause the advantages and claims for economy regarding gas ranges and water heaters, but who know nothing more regarding a fixture than the information given on the price tag. Such a salesman cannot properly understand a customer's requirements, nor talk intelligently with critical buyers of good things. Train your salesmen to understand and appreciate style and workmanship. Have them interest themselves in the customer's needs and peculiar conditions and let them give that intelligent advice and aid that a customer has the right to expect of you. Remember many of those customers appreciate good fixtures, and while they may not have a clear-cut opinion as to what they especially desire, they are dissatisfied if you do not appear to realize just what a problem the selection of their lighting fixtures is. Encourage them to pay a fair price for something worth having, and in the words of the familiar saying, "the satisfaction with the quality of the article will remain after the price has been forgotten." Have your samples displayed to the best advantage. A small stock of well selected fixtures, arranged in an attractive manner, is vastly better



than a large number of samples crowded together and poorly arranged. To the average customer, nothing is more bewildering than to gaze upon rows and rows of samples and attempt to make a selection. Of course, you are obliged generally to fill orders from stock, and customers desire the display of a number of samples from which to

make their selection; but let the method and arrangement of display be one of your first considerations.

Second—Be dignified in your advertising. There seems to be a tendency toward exaggeration in the advertisements of gas appliances that has the effect of lessening the confidence of the public in all gas appliances. While appliance managers are perhaps not directly responsible for this, they can certainly exert a strong influence in the right direction. What would you say, if you saw advertised tomorrow that a new incandescent electric lamp had been put on the market giving 100 candle power for 50 watts of current? It is equally as absurd to expect such an announcement as it would be to credit it. My attention has been repeatedly called to advertisements of electrical appliances, and I noticed particularly one describing a new electric lamp that has been recently put upon the market. The statement is made that it is a 2 watt lamp and should develop 22 candle power, with a consumption of about 44 watts. If you have occasion to purchase this appliance and test it, you are reasonably certain that the figures shown in the advertisement will be verified, and you are much surprised if you find a gross misstatement of facts. On the other hand, in recent popular magazines I have noticed advertisements of gas lamps, which are excellent devices, well made and good sellers, but advertised to give 200 and 300 candle power with a consumption of but a few feet of gas per hour. What would you say if an agent called upon you with the statement that he had a burner that would give 100 candle power to the cubic foot of gas? Wouldn't you sit up and listen if he even said 25 candle power and you could place full confidence in his statement? A short time ago a salesman strolled into my office to show me a new type of gas arc, having four burners for four mantles and a large globe covering the whole cluster. He evidently did not know that he was "bringing coals to Newcastle." I became interested to hear what he would say, and asked him a few questions. "This light is wonderful," he said. "It will give you 1,000 candle power, or as much as an electric arc light." This was truly something startling, and I asked him how much gas it would consume. "About 10 feet an hour," was his reply. Truly this was more startling. I looked over the familiar needle valve, Bunsen tube and mantles, and remarked, that the only novel feature that the appliance seemed to possess was the long length of the Bunsen tubes. "That is what does it," he told me. "only those are not Bunsen tubes, because we make them ourselves." This may be an exceptional case. I hope it is, but it is just such representations that tend to discredit gas for illumination.

Third—Encourage the adoption of smaller and better distributed units of light. A recent editorial in one of the scientific papers on high power light units gives a very interesting opinion on this question.

"That there is a general tendency toward the using of higher units is plainly evident from the facts. So far as there is genuine competition between gas and electric light the contest is usually to see who can produce the greatest flood of light for a given expenditure, entirely regardless of the visual and esthetic qualities of the illumination produced. The incandescent gas burner, with its fairly dazzling light of 60 rated candle power or more, could only be beaten by a cluster of the standard 16 candle power electric lamps, or the electrical arc. To compete with the latter, the "gas arc" was produced, which was simply a cluster of incandescent mantles. At last accounts, electric lighting had scored a complete victory by the introduction of the flame arc, which has left the gas arc and all other forms of illumination hopelessly behind in the race for garish brilliancy.

"In many respects the contest reminds one of the country band tournament, in which the band that made the most noise won the prize. Increase in light power by closely clustering small light units, has usually and rightfully been condemned by illuminating engineers; and the most serious fault of the arc lamp has been its necessarily high light-power as well as high intrinsic brilliancy.

"There are doubtless many cases where multiple lights, either in clusters or in chandeliers, can be very advantageously replaced with the more efficient units that are coming into use, but the ordinary dwelling house certainly does not afford such a case. While the general race of each to outshine his neighbors is interesting along "the Great White Way," there are few who wish to carry the contest into their private apartments; the rest and eye comfort resulting from a soft and comparatively low intensity of illumination are still demanded for the home. The chandelier with multiple lights, or the cluster, has the advantage of affording a variable illumination, and on this account alone must always take precedence over the single unit of high power for private lighting."

I do not intend to unduly criticize the gas arc in this statement, although prominent gas company men have expressed their disapproval of its general use, and a few years ago the American Gas Light Association had a lengthy discussion on this point. I do intend to criticize the use of powerful burners on a single arm of a chandelier or bracket. The only thing this method of lighting has in its favor is that it is cheap. It does not give good illumination, it is bad for the eyes and it is artistically barbarous. What is needed is a scattering of smaller units, thereby producing a better illumination, and at the same time an attractive appliance for lighting. Personally, I am a strong believer in the miniature mantle, such as No. 63 Welsbach. This little mantle gives much more candle power than a standard electric lamp and is the size used very generally by one of the largest makers of burners and appliances for gasoline gas in the country. I shall be very glad to see a mantle and burner put on the market of a size between this and the usual standard, something about the size of the No. 2 Kern mantle, that would give 50 to 60 candle power with about 3 feet of gas. Such a mantle could be used with standard electric glassware and would be a very useful size for fixture purposes. Regarding the inverted type of burner, I can only say that we are watching its development with much interest. In Mr. Lansing's paper, to which I have already referred, he says:

"There are, of course, many disadvantages today with the inverted burner, chief of which must be reckoned the discoloration of fixtures, and it would seem that the gas engineer has a fruitful field in getting fixture houses to design a line of fixtures which are especially suitable for the inverted type. Even the question of finish is important, as the ordinary brush brass or polished brass fixture tarnishes very quickly with the heat. If, on the other hand, finishes such as verde antique or other dark finishes, were used on both burner and fixture, the discoloration would show very much less. Of course, in many cases such finishes would not be suitable, but where they can be used, it will do away largely with this serious objection. The attempt to adopt the inverted burner to the present type of fixture is generally unsatisfactory; but it should be an easy matter to design fixtures which will be suitable for the inverted type, so that it will be available in many places where not suitable at present."

These suggestions regarding fixture construction can be carried out if conditions warrant the expenditure of the necessary time and money, and I trust that I may hear an expression of opinion from you on the question.

Fourth—Raise the standard of the appliance, and especially of the fixture that you sell. Too often, sad to say, the buyer of fixtures knows little of style or artistic value, and not much more of good workmanship. His standard seems to be, so much brass for so much money; and the manufacturer, striving to maintain a reputation for well made and really good fixtures, well finished and artistic, is turned down for the smaller maker, who buys stock, castings, shells and other metal work, employs cheap and inferior help and makes a mongrel design at a few cents lower price. These manufacturers receive very little encouragement in their attempt to elevate the gas lighting fixture and thereby the whole tone of gas lighting. Of the appliances that you carry, let your ranges and water heaters be well made, efficient and economical; let your mantles be good and reliable; let your burners and other attachments be well made, efficient and as attractive as they can be procured, but above all, let your fixtures be well selected, well made and attractive. These appliances, more than anything else you handle, should be both instruments of usefulness and of decoration.

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A New Society for San Francisco

A year ago last January a society was formed in New York City for the advancement of the theory and practice of illuminating engineering and the dissemination of knowledge relating thereto. The necessity for such a society has been proven by the remarkable degree of interest shown in the subject and in the formation of branches or "sections" in most of the large cities in the East.

Feeling that the time was particularly ripe for the installation of such a section in San Francisco, the present rehabilitation of the city making the consideration of the proper illumination of our new buildings one of paramount interest, the secretary for sections in the city and has organized a branch with the following staff of officers: Chairman, W. J. Miller; secretary, Wm. H. Crim, Jr.; board of managers, Fred Meyer and Prof. Carey of the University of California. With this staff, consisting of three architects and a university professor, all men of the highest standing in their respective lines, the section should flourish from the beginning. It has been launched under most favorable conditions, having a charter roll of over thirty-five members.

The inference might be drawn that, inasmuch as this is a subject usually left to technical men, the layman is not eligible, but as the subject of proper illumination is of interest to most everyone, and as the purpose of this society is "the dissemination of knowledge relating thereto," it is evident that qualification for membership is not limited to men of technical training. Meetings will be held for the presentation and discussion of appropriate papers; the publication of such papers: of discussions and communications and through committees, the study of subjects relating to the science and art of illumination, and the publication of reports thereon. The various papers and discussions are printed monthly and are furnished gratis to members.

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In Skyscrapers

Timkins—Well, I understand that you made money and are living high.

Tomkins—My dear fellow, don't you know that the height at which one lives varies inversely as the amount of money that he makes? I used to live on the fourteenth floor; now I live on the fourth.—Pacific Monthly.

Terra Cotta and Brick

Sand-Lime Brick

By E. W. SMYTHE

THESE seems to be a general impression that sand-lime brick is a new and untried building material; scarcely out of the experimental stage. Although sand-lime brick cannot boast of a pedigree traced to the time of the Pharaohs or the Tower of Babel, still it has been in use long enough to establish, without doubt, its quality as a first-class building material.

Sand-lime brick were first made in Potsdam, Germany, about 1820. Potsdam, situated in central Germany, is surrounded by a broad sandy plain; there being no clay or stone available for building purposes, sand and lime were made into mortar, molded into bricks and allowed to cure from three to four months in the open air. These brick withstood all the required tests and increased in hardness with age. The attention of Dr. Michaelis, of Berlin, in 1880, was attracted to this peculiar kind of brick, and after experimentation, he discovered, that by subjecting the green brick to steam, under pressure, the brick after a few hours was rendered as hard as though they had been exposed to the atmosphere for many months. After the discovery made by Dr. Michaelis, the manufacture of sand-lime brick increased rapidly throughout Germany and many large plants for their production were erected.

In our own country, the oldest sand-lime brick of which we have any record, are those in the walls of a house in Mobile, Alabama, built fifty years ago. As to whether these brick were made in this country, or elsewhere, is not known, but at any rate they are in good condition and appear to have been made in a manner similar to those first made in Germany.

But not until 1901 were sand-lime brick manufactured in any considerable quantity in the United States. During this year two plants were in operation. In 1903, sixteen plants; in 1904, fifty-seven, and in 1905, 130. At present, there are probably about 200 plants, all told. Among these plants there is a great diversity in the manner of handling and combining their materials. These differences occur from local conditions and the way in which they hydrate the lime and the manner of incorporating the lime with the sand.

In a general way, I shall now describe the process of manufacturing sand-lime brick, as carried on by our plant in Wisconsin, and then refer briefly to some of the methods used by other manufacturers.

The sand, as it is brought in dump cars from the bank, is shoveled into an elevator boot, from which it is elevated about thirty-five feet and discharged upon a vibrating screen. Here it is run through a ¼-inch mesh screen, and falls into a conveyor over the numerous coils of a steam dryer. The sand must be perfectly dry. There can be no half-way place in regard to the dryness of the sand, for you cannot mix sand and lime intimately, unless both are thor-

oughly dry. The wet sand, as it rests upon the pipes, dries and runs down into a hopper-shaped bin in the bottom of which is a conveyor for drawing the sand out as it is needed.

The lime is slacked in water-tight steel boxes, mounted on wheels. Each of these has a capacity of about 450 pounds of dry slacked lime, a quantity sufficient for one thousand brick. The quicklime is weighed out, placed in the boxes and the proper quantity of water added to it. To determine the correct amount of water to apply to the lime, in order that a dry slack may be secured, is not always easy, as the lime, when received at the factory is nearly always more or less air slacked, and also there is considerable variation in the quality of lime, even when the limestone comes from the same ledge. After applying the water, the lime cars are run under the brick cars in the same cylinder in which the brick are hardened, and the slacking is thus completed, and the surplus of moisture (if not too great) dried out. The dry slacked lime is now dumped from the cars upon a grizzly, which takes out all the large cores. Passing through the grizzly, the lime descends into a hopper and is conveyed to an elevator, which discharges it into a bolting machine where all the small cores are extracted. Leaving the bolting machine, the lime falls into a bin, directly opposite the bin containing the dry sand.

Between the lime and sand bins is a measuring device, and the dry sand and lime are brought to it by conveyors, placed in the bottoms of their respective bins. The right proportions being measured out, the mixture is allowed to fall into a preliminary mixer, where for two or three minutes the sand and lime receive their first mixing. Passing on from this mixer, the sand and lime are fed by a conveyor into a tube-mill, where they are thoroughly ground and mixed; each grain of sand is completely coated with minute lime particles. Leaving the tube-mill, the mix is at once elevated to a pug-mill, where just sufficient water is added to cause it to cling together when compressed slightly in the hand. The pug-mill discharges the dampened material into a four-mold press. The green brick are loaded upon cars, one thousand brick to a car, and run into a large steel cylinder, fifty feet long by six feet in diameter. After filling the cylinder (which holds a day's run), live steam is turned into it. About two hours are required to bring the steam pressure up to 120 pounds per square inch, which pressure is maintained for eight hours. After steaming, the brick are ready for market. Twenty-four hours have elapsed since the sand left the bank until it leaves the cylinder, a finished brick, ready to lay in the wall. In several instances, we have afforded masons the unusual pleasure of laying hot brick on a cold morning.

In the process of manufacture just described, the lime was slacked before incorporation with the sand, but in some processes the quicklime is ground, then mixed with the sand and passed through a tube or ball mill. After grinding, the proper amount of water is added, and the mixture is conveyed to a silo, where it is permitted to slack and cure for twenty-four or forty-eight hours. It is then withdrawn and made into brick. Others grind but a part of their sand and lime and some do no grinding whatever. There are some factories which use the damp sand directly, as it comes from the bank. To this damp sand, damp slacked lime is added. The two are run through a short pug-mill, then to the press and made into brick. The process is beautiful for its simplicity, but the product is not a credit to the sand-lime industry.

The materials entering into the manufacture of sand-lime brick are as common as that entering into the production of clay brick, but as all clays are not suitable for making good clay brick, so all sands are not suitable for making good sand-lime brick. The sand must be clean and contain a high per cent of silica. Of all the impurities in sand clay, iron oxide and feldspar are the

most common. The two latter may be left out of consideration, as they seldom appear, save in small quantities. Clay, however, is nearly always found in sand, and many times in considerable quantities. To determine what effect the presence of clay has upon the strength of sand-lime brick, Mr. Pepple, a member of the Ohio Geological Survey, made some valuable experiments. He made up numerous samples of brick, varying in each a percentage of clay. Upon testing these brick, he found that up to 3 per cent addition of clay, very little change took place in the strength of the brick, but for amounts over this there was a decided decrease, both in crushing and tensile strength. It was also interesting to note, that small amounts of clay decrease slightly the water absorption of the brick, acting to some extent as a water-proofing agent.

For the manufacture of sand-lime brick, a high calcium lime is by all means the best. Magnesian limes, while they give just as strong a brick as do the high calcium limes, are too slow in slacking, and one runs considerable risk in using them, since, if the lime is not thoroughly slacked before the brick go into the hardening cylinder, slacking will continue, and the lime expanding, will crack and ruin the brick. The best practice demands 8 per cent by weight of slacked lime. A less amount of lime than this does not give a brick first-class in strength; and a larger per cent than this, while it adds slightly to the crushing strength of the brick, it also adds to the water absorption, and incidentally to the cost.

To secure the best results, the lime must be thoroughly mixed and ground up with the sand. For this mixing and grinding there are various machines upon the market which can be used. Among them are the tube-mill, ball-mill and gyratory-mill. The last two mills mentioned, have one advantage over the former, that is of being able to handle the material when it is slightly damp; whereas, in the tube-mill, a trace of moisture in the material causes the lime to stick and form a coat over the side of the silex lining, in which case, little or no grinding is done by the mills. I believe the tube-mill to be the best, as it not only gives a very finely ground product, but also gives a more thorough mix than the other two mills. Another point in its favor is, that the cost of repairs on a tube-mill is considerably less than that required by the ball or gyratory mill.

In the manufacture of sand-lime brick, the machinery is subject to much greater wear and strain than that used in the production of clay brick, and the maximum of this wear centers in the grinding mill and the press. The press must be massive and built to withstand excessive strains, because a slight variation in the amount of water added to the mix, makes a very great difference in its compressibility—therefore, the press must have a large surplus of strength in order to withstand this extra stress, which will most likely be brought upon it. Within the press, the greatest wear is on the mold box and mold liners. A set of the best liners will turn out about one hundred thousand perfect brick. Beyond this number, they become considerably worn, and the edges of the brick are feathered and rough, so that they are suitable only for common brick.

In steaming the brick, two methods can be followed to secure the same result. Either a high steam pressure for a few hours, or a low pressure for a comparatively longer period. In either case, the brick will attain the same degree of hardness. Most manufacturers are, however, agreed that eight hours at a pressure of 120 pounds per square inch (two hours being required to bring the cylinder up to this pressure), is the best and most economical practice. The steam must not be turned in too fast, as the surfaces of the brick will become highly heated, while the interior remains cold; the unusual expansion thus produced, causes the brick to check.

Through the over zealous efforts of machinery jobbers, who think only of disposing of their machinery, an erroneous impression has been spread abroad, that sand-lime brick can be manufactured at extremely low cost. The cost of manufacturing sand-lime brick depends upon the same variable quantities as does the manufacture of clay brick or any other product. Labor and fuel are the main items in the manufacture of brick, and to produce brick cheaply, a dollars worth of labor must be got for every dollar paid for labor, and for every pound of fuel the greatest possible number of heat units must be utilized. It is the stopping of the little leaks that make the profits in manufacturing.

All things considered, I believe that an economically operated sand-lime brick plant and an economically operated clay brick plant, both making a first-class product, will, providing the cost of labor and fuel is the same, produce these brick at about the same cost.

In closing, I wish to quote two statements made by men, who, in their respective countries, are well acquainted with building materials. Says Fritz Polman, Architect of the Minister of Public Works of Germany, "The satisfactory experiments made with sand-lime brick have induced the administration of the State and cities to abandon their attitude, which was for a long time unfavorable, and to use this material in numerous public structures." The German government will use only building materials which have been subjected to thorough tests, extending over a period of ten years.

In a report issued by the Department of the Interior, of our government, Mr. Middleton, who compiled the report, makes this statement in reference to sand-lime brick, "That this method of manufacture of building material is a success, and will be a permanent factor in the building industry, is hardly to be doubted. It is also equally certain that it will never displace the time-honored burnt clay brick."

* * *

Clay Tile as a Building Material

THE use of the baked clay tile as a building material is becoming each day more and more general in this country and before long the tile will be almost as universal in its application in America as it is in Europe. The advantages of the clay tile are threefold in character. They are extremely hard and durable and last virtually forever. In fact baked clay is far harder than marble, slate or any other natural stones. It is likewise fireproof. Its excellent sanitary qualities are due to the fact that it is non-absorbent, germ-proof and easily cleaned. As the clay tile can be baked in almost any color, form or design the artistic possibilities of tiling are almost limitless. Its decorative qualities and extreme durability make the clay tile relatively one of the cheapest of the building materials.

The tile was formerly regarded as a luxury to be enjoyed only by the wealthy, but now it is generally looked upon as a hygienic necessity in many parts of modern building. The same sanitary conditions which made the tiled floors and walls of the bath-room an absolute essential, are bringing about the introduction of tiling into the kitchen, laundry and butler's pantry. Tiled walls are already regarded as a necessity in the modern hospital, and a tiled floor is looked upon as the nearest approach to the ideal hospital floor. In order to attract the public by their sanitary arrangements drug-stores, butcher shops, dairies and lunch-rooms are now being built tiled throughout. Tiled or ceramic mosaic floors are met with today in hotels, railroad stations, theatres, banks and other public buildings of all kinds.

The tiled or faience fireplace and mantelpiece is now a regular institution in our American architecture. As a fire-resisting material which suggests

warmth, tile work is the most appropriate around a fireplace, and the decorative features of tiling and faience are making these materials take up an ever greater proportion of the wooden mantel. While formerly the wooden mantel might be said to have contained a few tiles as facing, today the tiled mantel may be said to contain a little wood as a shelf, as columns or as finishings.

Like most of our American infant industries the tile industry is growing rapidly; but it is the utility of the product which commends it in the increasingly permanent character of our structures, as against the more temporary nature of older structures.—Industrial Magazine.



Living Cup Presented to Henry A. Schulze, Architect, by the Cement Workers' Union, San Francisco

Where he was Going

Singleton—Well, how is the family getting on?

Doubleton—Pretty well, I reckon; but they are getting on my nerves.

Singleton—How's that?

Doubleton—Well, my wife's going to New York for opera, my son is going to college, and my daughter is going to travel.

Singleton—And where are you going?

Doubleton—Going crazy trying to pay the bills.—Ex.

A Few Notes on Founding and Inspection of Cast Iron

By E. O. RITTER

GOOD cast iron, more particularly that used for structural purposes, should show a smooth, clear outer surface, with neat and sharp angles, and when broken should be of a light, bluish gray color and close grained texture. The color and grain should be uniform, and should not show up in different colored "patches", nor bubbles, and the iron should be soft enough to become indented if struck lightly on the edge with a hammer, but should not "chip off." I have observed that if cast under pressure, the metal becomes more compact and sound, therefore I think columns, pipes and the like, are stronger if cast in a vertical, rather than a horizontal position. In castings of this class a very common defect is the variation in the thickness of the metal, usually caused by the displacement of the core. I have frequently found columns with as much as eighty per cent of the metal in the shaft on one side, while the other side was little more than a shell at some places. Much evidence of this kind was exposed in the recent disaster, and I believe that through lack of inspection many such columns are being used today. The proper way to detect this is by drilling $\frac{1}{4}$ " or $\frac{3}{8}$ " test holes in the sides of the columns and measuring the thickness with a gauge made for the purpose. The thickness of the metal in pipes can be taken with the calipers and the surface should be closely examined for "swells", "scale" or "blisters". Another serious defect is "weak seams", commonly called "cold-shuts", and is caused by the metal becoming "chilled", so that it does not properly mix or unite. This occurs mostly in cases where castings are of such length as to necessitate "pouring" from both ends.

"Cavities", "blow-holes" or "honey-comb" are caused by the collection of foundry-dirt, etc., or by confined air. Defects of this kind are often closed with putty, loam, lead or babbitt, to deceive the inspector, but can be easily located on close examination by one who is familiar with this class of work, and if "tapped" with a hammer will give forth a dull sound. In castings where one side is much thicker than the other, the thin side cools first and is often subjected to strain during the cooling of the other side, severe enough to produce injury. This can be overcome to a certain extent by partially uncovering the thick side and allowing it to cool faster, but where castings are equally proportioned, it is a good idea to keep them covered and allow them to cool as slowly as possible.

After being removed from the sand, they should be thoroughly cleaned with steel brushes, superfluous parts chipped off, holes reamed, etc., and in facing care should be taken to get the exact length and bevel desired. Test bars should be taken from each "melt" as provided in the specifications, and should be broken in the presence of the inspector, who should note the deflection, breaking-weight, fracture, etc. Bars most commonly used are cast 1" square by 5' long and in breaking should be placed on supports 4' 6" apart, and loaded in the center until broken.

* * *

A passer-by was amazed at seeing an Irishman poking a dollar bill through a crack in a board walk.

"What under the sun are you doing that for?" he asked.

"Why, y' see, sir," replied the Irishman without looking up from his work. "a minute ago Oi dhropped a nickel through this crack, an' now Oi'm puttin' a dollar through so's to make it wort' me whoile to pull up th' walk an' get th' nickel."—Everybody's Magazine.

An Attractive Dining-Room in a City Flat

By MINERVA L. POWER

Before the San Francisco fire Minerva Lester Power sent to the House Beautiful a description of her dining-room in a cosy flat situated in the heart of the city. Her home was burned but her description is none the less valuable, note that the rebuilding of the city is well advanced and ideas such as those offered by her are much in demand. We print the article as it was written without change of tense.

SAN FRANCISCO abounds in flats. There are hundreds of them, all on the same plan inside and out; and the majority of them are furnished in the same stereotyped manner. But this little flat is so different that it is interesting.

The dining-room has a southern exposure with a large bay window through which the sun shines all day. The flat is in the third story, so a garden is impossible, but long boxes outside the three windows are filled with nodding nasturtiums, and are always a blaze of color, beginning with pale corn and running on up the gamut through the yellows and on into rich velvety browns.

The woodwork of the room is California redwood, the silky texture of which has been greatly enhanced by a stain and then a wax finish, which gives it a beautiful rich tone, between orange and golden brown. There is a plate shelf two and one-half feet below the picture molding, and this shelf caps a succession of plain panels about one and one-half feet wide, which extend around one side, and between the windows of the bay and between the two doors at the opposite end of the room. On the western side of the room, which is opposite the plain paneled one, and which is the long side of the room, is a coal grate of tan and terra-cotta brick. There are two china closets on either side of the grate, running out even with it and extending up the same height as the plate shelf. Extending up to the picture molding is a soft orange-colored frieze, on which a flock of white storks with black legs and yellow beaks are flying. The ceiling is a rich cream color.

The floor is stained and waxed and is several shades deeper than the side walls. It is all covered but a narrow strip around the sides by a very stunning rug, of oriental design, in shades of brown, yellow, orange, black, and quite a little blue.

The two doors to this room, which have three panels of the wood between and a corresponding width of shelf, have three of the cross-wise panels for the lower portion and six small squares of yellow glass above. The hardware, such as locks, knobs, and fittings, are of copper.

The dining-room table is of the craftsman sort, a design which might have been seen in the California building at the St. Louis Fair. The top is a solid piece of curly redwood polished and waxed till it closely rivals mahogany, and is more beautiful in color and silky texture. The seats for this table are a sort of stool or small bench, a design also seen with the table at the Fair. One is strongly reminded of the old missions when looking at this table and its odd little seats.

Instead of the usual linen cloth, the mistress of the house uses one long runner through the center of the table and two shorter ones across the width. These are of coarse gray homespun linen, hemstitched all around, and having embroidered down the left side of each end just inside the hemstitching in Chinese characters the family name in dull blue cotton. The napkins are of the same material and marked the same, except the letters are smaller.

The china used in this dining-room is blue and white Imari ware, many

fine specimens of which decorate the plate shelf, with here and there a yellow or brown pitcher or jug covered with a brown rattan basket-work, so much used by Chinese and Japanese potters. Odd pieces of copper are also seen and blend exquisitely with the coloring of the room.

In the recess above the grate is a water cooler of crude shape in rich terra-cotta colors, also a deep blue vase with straight sides filled with bright blue corn-flowers, and a rare old blue Bohemian cut-glass wine bottle.

When the table is not spread, we find at one end a square of wondrous blue and brown Japanese embroidery, which has been applied to a soft brown leather strip, stayed here and there by a band of hand-wrought copper. Upon this rests a copper bowl filled with yellow or blue blossoms, and at the other end of the table, on a hand-beaten copper tray, stands a thick and heavy looking yellow pitcher with its thick and heavy drinking cups—six.

The curtains are also interesting. They are made of raw silk, a shade lighter than the frieze, and have the Chinese characters one below the other, spelling the owner's name, the letters some of them being six inches long and three and one-half inches wide. The letters run down the two insides of the curtains just inside the drawn hemstitching, to harmonize with the table linen. The gas and electric fixtures are of copper with globes of yellow, opaque glass.

* * *

How a Firm of Architects got its Name on a Building

CLOSE observation on the part of a newspaper man in Boston several years ago revealed a striking device employed by the firm of McKim, Mead & White, the noted New York architects. The device was an acoustic of names famous in history, literature and art by which the firm's name was to be engraved on the Boston Public Library. As may be observed, the arrangement defied literature, history and philosophy in arrangement, and this was the thing that attracted the newspaper man's attention. The names were conglomerated from all nations and ages into a seemingly neat ornamentation for the fine building. Beginning at the top of a space to be devoted to names famous in the world in various lines were the following:

Moses,
Cicero,
Kalidasa,
Isocrates,
Milton.

These names, through their initials, formed the first part of the acoustic, spelling plainly "McKim." A slight space appeared before the next list of names, which was:

Mozart,
Euclid,
Aeschylus,
Dante.

The initials of these names brought out the second name of the firm, "Mead." Another slight space, and the following names appeared:

Wren,
Herrick,
Irving,
Titian,
Eramus.

Here was the name "White" also engraved, the whole device bringing out the firm name of "McKim, Mead & White" in connection with the world's famed men. It was in 1890, just before the building was completed, that the discovery was made and published. The list of names was changed.

Among the Architects

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Next Convention at Chicago, Illinois

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Engineers and Architects Meet

The Engineers and Architects' Association of Los Angeles held a regular meeting and dinner at Levy's Cafe Friday evening, April 12th, and discussed the advisability of the paying of contractors on the percentage or fixed fee basis, as compared with the payment of the lump sum or fixed rate per unit.

Among those present were Samuel Sturrow, Carl Leonardt, William Mulholland, A. H. Koebig, Gen. Forman, F. J. Trask, John P. Krempel, A. B.

Benton, H. Brett, R. H. Manahan, T. D. Allen, Horace Taylor, H. Z. Osborne, Jr., Charles Kern, City Engineer Shaw of Long Beach and Superintendent Peck.

Brief talks followed by Samuel Sturrow, Carl Leonardt, A. B. Benton, Arthur S. Bent and C. E. Richards, showing that the trend is toward a better understanding and closer co-operation among contractor, engineer and architect.

Los Angeles Office Building

Architect Harrison Albright of Los Angeles has been employed to prepare plans for a ten-story reinforced concrete building for the Consolidated Realty Company. It will be an office building and the location is the corner of Sixth and Hill streets, Los Angeles. The building will have a frontage of 150 feet on the west side of Hill street and 126 feet on the south side of Sixth street, and the estimated cost is \$400,000. All footings, columns, girders, beams, floors, roofs, interior and exterior walls, stairways, balustrades and facings will be constructed of concrete.

New Home for Brittain & Co.

Brittain & Company, the well-known hardware firm, is to have a home of its own with ample quarters for a constantly increasing business. The company has completed negotiations with Mrs. Elsie Drexler for a lease of a building that is being erected on the north side of Market near Mason, San Francisco. The structure will be of reinforced concrete, seven stories in height, and will have a depth of 90 feet, with a frontage of 56 feet on Market street and 25 feet on Mason. Reid Brothers are the architects and the Kittle Construction company is erecting the building.

The terms of the lease are for ten years at an approximate rental of \$500,000. J. N. Brittain, president of the company, said in an interview: "While we have unquestioned faith in the business

permanency of the uptown districts and will not abandon our store at Van Ness avenue and Turk street and the one on Sutter and Polk streets, we want to be among the first to help remake Market street. The terms of our lease are favorable, and we are pressing the contractors to rush the work."

Oakland Contractors Busy

The Roberts Bros. Company of Oakland are getting a good share of the new construction work across the bay. They have begun the erection of a new telephone building at Telegraph avenue and Forty-fifth street to cost \$29,000, and a few days ago the company was awarded the contract for putting up the fine new Taft & Penroyer building on Clay street, near Fourteenth. The plans call for a thoroughly modern structure with a private fire plant and a compressed air cleaning plant. It is calculated that it will take sixteen months to complete the building.

Palace Hotel Site is Cleared

The Palace Hotel ruins are no more. The last of the debris was cleared the past month and there is now nothing to hinder beginning work on the new hostelry. It took just 156 days to wreck the old building and remove the debris. The McLellan Company was given the contract on its bid of \$100,000 in cash, and to receive all salvage in the way of junk and brick. Mr. McLellan says he was able to get 2000 tons of old iron and 8,000,000 good bricks. The latter sold at an average of \$12 per thousand. About 5,000,000 bricks were broken in tearing down the walls and in breaking up the foundations below the sidewalks. Some of the latter were utilized by being crushed and sold for the same purpose as crushed rock.

Redwood City Court House

Architect Glenn Allen of 330 Turk street, San Francisco, has his plans for the Redwood City Court House accepted and the Supervisors will call for bids to be in by May 30th. The design calls for a steel frame structure two and one-half stories high with copper dome. There will be reinforced concrete floors and walls and brick exterior with stone trimmings. The estimated cost of the building is \$175,000.

Normand W. Mohr, architect has moved to office No. 17, Arcade building, 1228 Fillmore street.

Building Quiet—Prices Drop

Architects report a noticeable falling off in business the past month. Small work has been stopped almost entirely and a number of architects have let out some of their draughtsmen. It is expected that the let up will be only temporary, however, and the result will probably be the restoration of conditions to their normal state. Meanwhile there should be a tumble in prices of material. Indeed, the fall has already begun insofar as lumber is concerned.

The price of lumber in the local market dropped \$6 a thousand feet within a very brief period, and all indications point to a further decline. Other materials used for building are also on the decline, and property owners whose plans for rebuilding had to be deferred owing to the excessive cost of material will again invite bids for new structures.

It was recently learned that a number of the contractors who came here from the East since the April fire and have secured contracts for several very extensive structures are purchasing their material in New York, Chicago and other Eastern trade centers. Those places are not the only sources of supply. There are 100,000 barrels of cement from foreign ports on the waters heading for this city, not including seventy ships laden with building material of all kinds, including marble, iron, cement and lumber, coming to San Francisco from ports in England, France, Germany and Italy.

Lime has declined from \$2.25 a barrel to \$1.75, and a further decline is expected in the near future. One dealer made a contract to deliver in ninety days 3000 barrels of lime at \$1.60 per barrel.

Big Steel Contracts Soon to be Let

Steel men are much interested in the outcome of the bidding for the new Phelan building, the Palace Hotel building and the First National Bank building. All three structures will cost \$1,000,000 or more each, and each will have heavy steel frames representing an expenditure of many thousands of dollars. The contract for the Phelan job will probably be the first of the three to be let and it is reported that the American Bridge Company will be the fortunate competitor. The Phelan building is being planned by Architect William Corlett, while the D. H. Burnham Company are the architects for the First National Bank building.

Contract Let for Court House

The board of supervisors of Sonoma county has awarded the contract for building the new court house to the Rickon-Ehrart Engineering and Construction Company of San Francisco, which had two bids, one for \$256,380 and the other for \$325,880, the former being reinforced concrete with cement finish and the latter for reinforced concrete faced with terra cotta.

The figures submitted by the various bidders were based on reinforced concrete walls and cement or terra cotta facing. In the figures given below the bid "a" is for the cement facing finish and the "b" for the terra cotta finish. These are the bids of the various firms: Pacific Construction Company, (a) \$329,638; (b) \$387,938.

Atlantic, Gulf & Pacific Company, (a) \$356,000; (b) \$379,000.

Rickon-Ehrart Engineering and Construction Company, (a) \$256,380; (b) \$325,880.

American-Hawaiian Engineering and Construction Company, Ltd., (a) \$340,000; (b) \$380,000.

Cotton Brothers bid \$342,900 on the cement facing, but did not submit a figure on the terra cotta finish.

James O. Kuykendall, (a) \$313,987; (b) \$367,987.

P. J. Lynch, (a) \$342,000; (b) \$393,000.

Of Value to Architects and Engineers

Washington.—Extensive tests to determine the strength of the commercial timbers of the United States are being made by the forest service. Such information is of great value to architects and engineers in that it enables them to use more economically the products of the forest.

The tests are made on large beams. The material is generally tested while green, since timber is weakest in that condition. The strength of a beam is indicated by the greatest fiber stress developed during the test. Technically speaking, the breaking strength is termed the modulus of rupture. By using it the load that any beam will carry can be calculated.

Bakewell & Brown and M. J. Lyon are the only San Francisco architects who have registered in the open competition for the new building of the International Bureau of the American Republics.

The Worswick Street Paving Company has taken the contract for macadamizing the main business street in Hol-

lister. Mr. Worswick is personally superintending the work.

Wages in San Francisco

	Per Day.
Plumbers	\$6.00 to \$7.00
Plasters	5.00 to 9.00
Brickmasons	6.00 to 8.00
Carpenters	4.00 to 6.00
Cement Workers	4.00 to 6.00
Hod Carriers	3.00 to 5.00
Laborers	2.50 to 3.00
Blacksmiths	3.50 to 4.50
Blacksmiths' Helpers	2.50 to 3.00
Sheet Metal Workers	3.50 to 5.00
Lathers	5.00 to 7.00
Stone Masons	7.00 to 9.00
Boiler Makers	4.00 to 4.50
Painters and Paper.....	
Hangers	3.50 to 5.00
Structural Iron Workers (Shopmen)	4.00 to 5.00
Structural Iron Workers (Helpers)	2.50 to 3.50
Machinists	3.50 to 4.50
Pattern Makers	4.00 to 5.00
Electricians	5.00 to 6.00
Molders and Core Makers	3.50 to 4.50

Book Review

"The Architects' Directory and Specification Index for 1907." Containing a complete list of the architects in the United States and Canada. Classified by States and towns, indicating those who are members of the American Institute of Architects; also the names of the officers and locations of the different architectural associations in the United States and Canada. Prepared with the greatest care to secure accuracy both in names and locations.

This directory, known among architects, manufacturers and dealers in building materials as the Red Book, has just come out for the year 1907, and is gotten up in a very commendable manner.

The general list of architects shows an increase, and the change of addresses and of firms has been very considerable during the last year. The activity in building has evidently resulted in many rearrangements among the members of the profession.

The list of architectural societies has been carefully revised, giving the officers for the present year.

The building departments are also carefully listed, giving the officers for 1907.

"The Specification Index" for this year has evidently received special attention, and is much more complete than ever before. Published annually—eighth edition. One 8vo vol.; red cloth. Price, \$3.00.

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Advance sheets from May "Fireproof Magazine" show the scope and improvement there has been in that lively journal that has done so much to awaken popular interest in the better construction of our cities. One of its most forceful articles is a stirring appeal by Architect Fitzpatrick, the chief officer of the Building Inspectors' Society (representing virtually all the principal cities of the world) to municipalities and individual owners to give at least as much attention to fire-prevention as to fire-fighting.

The writer describes the efforts and expenditures made by cities for increased water supply and wonderful fire apparatus, while more and more fuel is constantly being added for possible conflagrations to consume. It is made quite evident that a much less effort in the right direction, the compelling of fireproof construction in all new buildings and the re-vamping of the old ones so as to make them less combustible, would soon effect a much lessened expenditure for fire-fighting appliances and insure greater safety to life and property.

No country on earth tolerates such fire losses as we do; we have permitted to be destroyed over a billion dollars' worth of property in six years; our normal fire loss is a million dollars a day; the average city of three to five hundred thousand people is lucky when the year's fires do not net \$500,000 damage, while in Europe cities of similar size feel terribly stricken when more than \$50,000 represents the year's loss. Mr. Fitzpatrick's appeal through the press is but a reiteration of what he has so persistently preached to our city officers. Much good has resulted from this work, virtually hundreds of cities having revised and improved their building ordinances, but there is yet much to be done and it behooves all intelligent municipalities and thinking individuals to listen to and follow the advice of this keenest of observers and most public-spirited of experts.

LESS WATER AND SAFER BUILDINGS

In normal years our fire losses reach \$200,000,000; with a fire like that at San Francisco the total loss is increased to \$500,000,000; the International Society of Building Commissioners, that naturally keeps most accurate tally of such matters, is authority for the statement that our losses so far this year have reached \$1,000,000 per day, and some Government statistics just issued give us the startling news that of that great fire waste fully \$100,000,000 per year is accompanied by crime. Fire is but the result of poor construction and negligence, and, involving human life and others' property as it does, such negligence is criminal, but the criminal feature referred to in these Government figures is still more direct. It is claimed that that enormous loss in property is caused by people deliberately setting fire to buildings, active incendiarianism, either to secure resultant insurance indemnity or to conceal other crimes.

It would seem that one aspect of the case would be sufficient to induce municipalities and individuals to build better, thus necessitating lessened insurance, a removing of the temptation to acquire it and making it impossible, by reason of better construction, to burn buildings.

Glazed terra cotta is being adopted very extensively by San Francisco architects as a substitute for stone. It is light, as fireproof as anything, and can be handled speedily.

TERRA COTTA TAKES PLACE OF SANDSTONE

Glazed terra cotta has been found to be absolutely impervious to moisture and is easily cleaned of any dust that may adhere to the surface. In fact it has all the favorable qualities that stone has not. Architects were bitterly disappointed with the way sandstone passed through the earthquake and fire. The shake caused the big stones to crack badly while the heat of the fire made the stone crumble and break apart like so much dirt.

Glazed terra cotta can be had in all colors so that the most beautiful coloring effects may be obtained in a permanent way that leaves no guessing as to the future results.

While it is generally held that the architect receives less for his services than is his due, there is not the same uniformity of opinion concerning the fairness of a commission basis for his remuneration. Some argue that a lump sum would be more equitable. A variation on the lump-sum plan has been found to work very satisfactorily in practice, both by the owner and the architect. This provides for the establishment at the start of a fixed price as the cost of the proposed building. The minimum price to be paid the architect is also fixed in advance. This may be a lump sum determined on a basis a little under the Institute schedule, say of 4 per cent.

A further agreement between the owner and the architect provides that the latter is to receive, as additional compensation, a commission of 10 per cent upon what he saves the owner on the cost price as fixed in advance. One architect's returns under such an arrangement equal 7½ per cent of the final cost of the buildings, and the owner is satisfied that he builds at a price appreciably less than would be possible under the usual plan. Probably this arrangement would not be equally satisfactory for all classes of buildings. The Inland Architect says it has been found to work well with such buildings as factories and warehouses, classes where it is not difficult to fix in advance a fair cost price, nor to readily detect as the work progresses inferior workmanship and materials.

An important consideration in such a plan, of course, is that the owner must have absolute confidence in the integrity of his architect, and feel that the effort to save will not be at the expense of good construction.

The Publisher's Corner

To Make Specialty of Cabinet Work

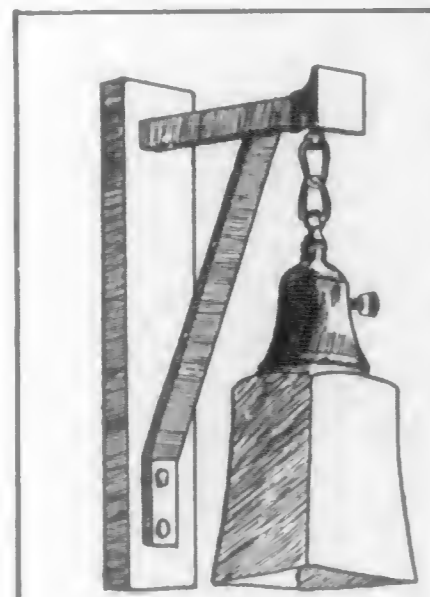
The Inlaid Floor Company has enlarged its factory and added new machinery with a view to specializing high class mill and cabinet work. The plant has been equipped with the most improved electrical machinery, in addition to a dry kiln and a complete steam heating plant which insures satisfactory work. Architects and contractors are advised that orders for sticking, shaping, band-sawing and turning will be executed with promptness at reasonable figures. The company carries on hand a large stock of kiln-dried oak, mahogany and other hardwoods.

The company has lately built a handsome hardwood sideboard for H. C.

Holmes and it has been installed in his new residence on Buchanan street in San Francisco. Practically all the hardwood finish for the several cigar stores of the United Cigar Company, planned by Architect Albert Farr, was turned out by the Inlaid Floor Company, as was all the hardwood finish in the handsome cigar store of G. E. Bier on Mission street.

Watson Roof Company Busy

The W. J. Watson Roof Company is rushed with work. This company is the successor to the roofing department of the Pacific Refining and Roofing Company, a pioneer in the roofing business in San Francisco. Since the fire



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Mr. Watson has personally supervised the management of the company and that he has met with abundant success is evident by the business the company is doing. Among the large contracts taken recently is the roofing of the Alexander Hotel; also the Viavi building, the Marston building and the Pacific Grand Hotel.

Harmony in Home Furnishing

It is a recognized fact that within late years a great deal more attention has been given to harmonizing not only the color schemes in house decorating, but in the designing of the room furnishing and furniture, following more closely the principal architectural features of the building.

The Beach-Robinson Company of San Francisco and Oakland has made a careful study of this class of work and is not only designers and manufacturers of furniture made with a view to bringing about an harmonious effect between the architectural feature of a room and its furnishings, but is also one of the few concerns on the Pacific Coast that are direct importers of French, Italian, German, English and Oriental floor coverings, wall coverings and upholstery goods. They are the only Western representatives for the world famous Aubusson carpets and chair backs and seats. Parties contemplating furnishing their home with foreign tapestries and like materials need not now go abroad for these things.

San Jose Architects Busy

Architects Wolf & McKenzie of San Jose have quite a little work in their office just now. They have the new county hospital costing \$86,000; a brick building costing \$30,000 for the Walsh-Cole Company, wholesale grocers, a \$30,000 cannery at Sunnyvale; a \$10,000 residence for J. H. Platte at First and Hobson streets; a \$12,000 residence for William Bogan of San Francisco, now in course of construction on the Alameda in San Jose; a hotel in Sunnyvale for John Ryan and an apartment house in Sunnyvale for E. L. Roberts.

Big Demand for Edwards' Fire Proof Windows

The A. C. Rulofson Sheet Metal Works have the contract for furnishing the new Humboldt Savings' bank with "Edwards" fire-proof metal windows and frames. It is gratifying that local manufacturers have grasped the situation and equipped themselves with all the modern appliances for making metal windows, which is a new industry on this Coast.

The contract for this work was awarded to the A. C. Rulofson Sheet Metal Works in competition with the largest Eastern manufacturers, and they were awarded the contract on account of the superiority of the local product, which speaks well for our home industry.

The same company is installing the "Edwards" metal windows in the "St. Clair" and the "McGregor" buildings, being erected by the Boyd Estate, and many other structures being put up in the new city.

To Install Heating Plant

The Machinery and Electrical Company will install the heating and ventilating system for the Security Savings' Bank in the Security building at Fifth and Spring streets, Los Angeles.

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General View of Joshua Hendy Iron Works, Sunnyvale, Cal.

The Hendy Company's Great Plant

Little more than a year ago the Joshua Hendy Machine Works were destroyed in the great San Francisco disaster. Soon after it was decided to erect new and larger works at Sunnyvale, in Santa Clara County. The pattern shop was in operation by the first of November, the foundry by the first of January, 1907, the machine shop and other shops by the first of February, and today the whole plant, with its magnificent equipment of modern, up-to-date tools, is running full blast. Some idea of the extensive nature of the buildings and yard can be gained from the accompanying photographs.

The old firm of the Joshua Hendy Machine Works, incorporated in 1882,

on September 11, 1906, was merged into a new corporation to be known as the Joshua Hendy Iron Works. The new company has a capital stock of \$1,000,000, and has erected at 75 Fremont street, just half a block from Market street, San Francisco, a fine two-story office building, the first one of a permanent nature in that part of the city. It has a frontage of 91 feet, and contains a show-room whose unusually large floor space is well stocked with engines, boilers, hoists, and other classes of mining and accessory machinery for which the house is so well known.

The works at Sunnyvale cover about twelve acres of land, thirty additional acres being held in reserve for future extension. The main buildings form a



Showing Switching Facilities and Portion of Main Foundry, Joshua Hendy Iron Works, Sunnyvale, Cal.

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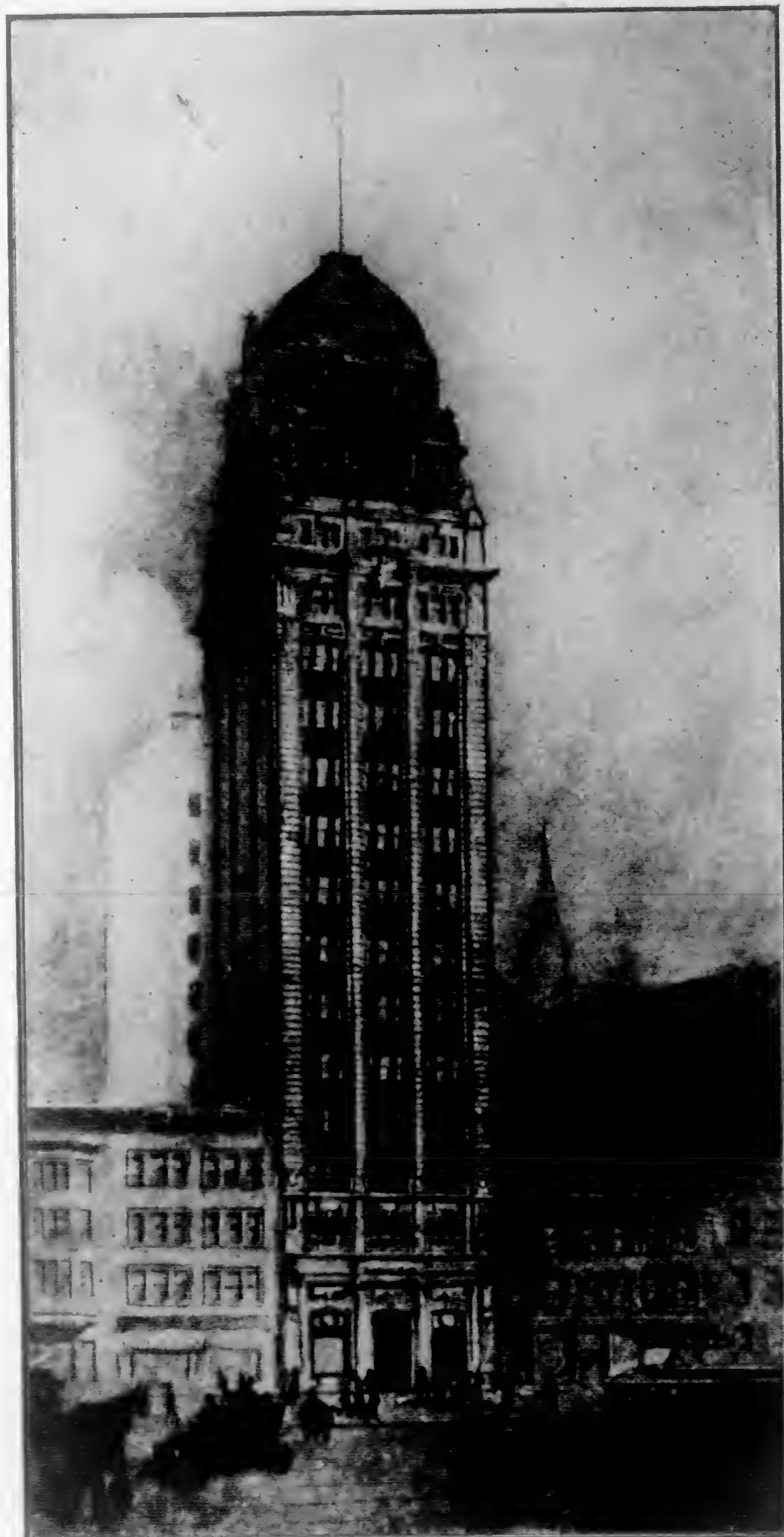
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The Humboldt Bank Building occupies a lot on the south side of Market Street about 100 feet east of Fourth Street with a frontage of 50 feet on Market Street and a depth toward Stevenson Street of 170 feet. The main front on Market Street is to be seventeen stories high with one or two stories in the dome in addition. To plan a water system for a building of this kind, required engineering skill and broad practical experience. We offer you both; and we will make no charge for preliminary estimates, prices and plans.

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quadrangle, in front of which and facing the railroad tracks stands the office and administration building, whose quaint Mission style, with rough cement finish and red tiled roof and cupola make a pretty and effective contrast to the surrounding orchards. A splendidly-equipped and well-lighted draughting room occupies the southeast end of the building, and at the northwest end are the equally well-arranged offices for the staff.

Directly back of the administration building is the main machine shop, which is 420 feet long and 80 feet wide. It is equipped with a 20-ton Niles traveling crane, electrically driven. It is also equipped with independent electrically driven tools of the most up-to-date types.

The foundry building is 256 feet long by 80 feet wide, is also equipped with an electrically-driven Niles traveling crane, and has two cupolas with a capacity of from fifteen to eighteen tons per day, which can be increased according to demand.

The main blacksmith shop has a most complete equipment, including steam hammer, forges, furnaces, and all the usual small tools. The boiler shop and steel plate working department, where ore

cars and other similar manufactures are produced is also furnished with pneumatic riveter, punches, shears, and other modern tools.

The main yard tracks which connect with the railroad siding of the Southern Pacific Company pass through the main machine shop at right angles, the entrance and roof at this point being sufficiently high to admit of the locomotive cranes passing through the building from the main yard to the Southern Pacific siding, which is a great convenience and facilitates the handling of heavy machinery.

The yard has two main lines of standard gauge track with branches and switches to the various buildings. The steam-driven locomotive crane enables as many as four or five standard railroad cars to be hauled from the siding to any part of the works and readily loaded or unloaded.

A very important factor in the erection and equipment of this plant are the precautions against earthquake and fire, the general arrangement being such as to insure the greatest safety possible. A steel tank 70 feet in height is kept filled with water, and is connected with mains throughout the entire works. Independent high pressure electric pumps have



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COUNTING THE COST

To the Editor The Architect and Engineer—It should be obvious to the thoughtful citizen that labor unions have no monopoly of strikes. Capital, weary at last of labor's excessive demands and of the present prices of building materials, seems to have gone on strike itself. "Financial stringency" but meagerly describes the existing conditions. There is plenty of money, as much as there ever was, and California's resources are practically illimitable, but a halt had to be called on the reckless methods and reckless expenditures which have obtained so largely since the disaster of April, 1906. Extraordinary events of course, precipitated extraordinary conditions, but the abnormal phase could not continue forever, and the day of reckoning has arrived.

The crisis, which for some months had been looming on the horizon, was apparently precipitated by the various strikes commencing about May 1, the chief and the most distressing of which, because of general inconvenience and injury, is the strike of the Carmen's Union.

Mr. Calhoun of the United Railroads accepted the gauntlet thrown down by the Carmen's Union. Yet he was ready once more to submit the men's grievances to arbitration and although the constitution of the Carmen's Union ordains that it shall seek arbitration before a strike, Mr. Cornelius—and without Mr. Mahon's veto—called the men out. The result has been extraordinarily vexatious to the third party to all such strikes—the passengers or consumers. Retail business has been paralyzed, various enterprises have been frustrated or postponed, and the banks have adopted the most stringent policies of non-accommodation. Business is dull, money is tight.

Conditions are serious enough now, but of the morrow none dare prophesy, either for labor or for capital.

The truth is that the reign of universal prosperity has all too suddenly been deposed.

The abnormal conditions that have obtained since the disaster could not continue forever. The cost of living and of building must be reduced, and business restored to a normal basis. It is quite impossible for San Francisco to continue putting up buildings, for from 20 to 40 per cent more than the same buildings would cost in other cities of the same size. The truth is, that the carman's wife is not the only one who cannot afford "a silk gown and matinee tickets" all the time. Extravagance has been the rule dominant of the twentieth century and San Francisco as usual has lead. In fact the majority of men in all walks of life, if the truth were known, have been living on a larger scale than their true earning capacity, if not their incomes, warranted.

Both capital and labor must come to their senses and in the words of the late Mark Hanna: "Yield to the great law of fair dealing between man and man. . . . I am sure that the American people will sustain a policy, based upon the highest moral and social impulse, which will eliminate the passionate prejudices that now exist between capital and labor."

"Life," wrote Senator Hanna, "is a matter of mutual interest between labor and capital; it is not possible for one to prosper permanently unless the other shares in that prosperity."

Had Mr. Hanna been spared, the work of the Civic Federation and its simple motto, the Golden Rule—the united effort of the general community which desires to avoid the disordering of its business and transportation—doubtless would have been far more prevalent and efficient. The Civic Federation opposes the sympathetic strike, opposes the boycott, disapproves of the restriction of production to enhance values, and urges, as a sure foundation for capital and labor, absolute confidence on both sides.

It should be hardly necessary for a writer in The Architect and Engineer to point out that organized labor has made excessive demands during the

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last twelve months in San Francisco. But a few instances may be of value. The cost of brick in the wall is \$25 to \$30, per thousand, while in other cities of equal size the cost has been from 33 to 40 per cent less for the same work. Our union bricklayers desire a \$7.00 eight hour day—\$8.00 or more for eight hours is what they want—and expect to get, while the number laid is in an inverse ratio as compared to the wages demanded.

Who now dares to guarantee first-class reinforced concrete building construction on a basis of 16c or even 20c or 24c per cubic foot of contained space? How many Class B. buildings have been constructed within the estimate during the past year? How many have been built that did not cost more than 25% to 40% above the original estimate? Some have cost 100% more than the estimated cost and what has the owner to show for the excess of money invested? Can a rental rate be saddled onto financially reliable and permanent tenants that will permanently produce adequate returns on this "watered" cost? From \$1.92 to \$2.50 per square foot per year of office floor space can be obtained for modern offices in modern buildings with up-to-date conveniences and service, and most office space must rent for far less although an occasional choice location may bring more, but the ruling rate can be no more here than elsewhere, and in all other cities this rule holds. San Francisco office space never was nor will be higher than similar space in similar cities, once the demand occasioned by the fire is supplied. The same holds true as to lofts, warehouses, wholesalers' locations and in fact all property of this nature except some financial institutions and certain retail concerns who seem able to pay whatever becomes necessary to get the location they want. Such being the case, who is going to make good to the owner of buildings that cost so much they cannot possibly earn a fair return on the money invested? The answer is—capital can wait—it neither sews nor spins nor does it have to eat or pay rent for being housed—so it can wait indefinitely.

So if the returns of the proposed investment are plainly inadequate to warrant the outlay, then neither will banker loan nor owner build and the result is what we are now facing.

The increase in the cost of building material has been decided. Lumber went up—it has also been coming down. Other materials are lowering but it is labor that the greatest advance has been made—by the shortening of hours

and the increase in pay, and if organized labor can bring it about, the end of the advance is not yet. While a reduction is not yet even considered. The cost of living is given as an excuse in many cases but aside from a very decided increase in rental demands for residents and flats occasioned by fire and which can be but temporary, (even now there are many "for rent" signs up), the cost of living as represented by the cost of food products is rather less in San Francisco and the trans-bay cities than in cities of corresponding size elsewhere in the country. Meats cost less here. Flour and other staples about the same. Fruits and vegetables decidedly less, in fact very few things that are generously bought cost more here, even to the extent of the freight paid for their transportation from the East. Thus it would seem that all the talk about high living is not borne out by the facts—when facts are adduced. Much is heard about the "San Francisco standard of living," which is supposed to call for an expense considerable in excess of that required in less favored sections of the country. If the San Francisco standard of living demands excess pay to the extent of seriously delaying the rebuilding of the city then the standard would seem to be a false one or else misunderstood.

Perhaps this so called "standard of living" is to be a new excuse for the violation of law? Is it to be added to our other "unwritten laws"? Are we to have it appealed to in the passionate pleas to juries and hinted at in Sunday sermons and "played up" in the "yellows"?

The crisis that confronts San Francisco today is not merely industrial and economic; it is of vital social significance and of instant menace to every citizen. In an editorial the Argonaut recently maintained with much truth:

"When, in the course of conflicts like that which now convulses San Francisco, there is violent interference on the part of strikers, government must step in to sustain the right of him—call him scab, strikebreaker, or any other term of opprobrium if you will—who elects to work. Government must maintain the law, since otherwise its own mandate would be lost. A government incapable or unwilling to sustain the law to support citizens in their right to work, would, as we have hitherto declared, be no government at all; it could not live, because it could serve no purpose, and society would not support it. Outside of its duty to maintain the law and the right of every citizen under the law, government has no mandate. The striker, seeing another take up the work

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he has lain down, seeing him protected in it, is forever complaining that the law gives its favor to the "scab." He is wrong—stupidly, pitifully wrong. Government is on the side of the "scab" only in so far as the "scab" is within his rights; and so long as he remains within his rights it must support him.

Force of arms may no longer win labor controversies in civilized countries without swift and sure punishment. If the commonwealth, through its officers, fails to enforce order and protect those who interfere and by force or fear compel a cessation of work—then that commonwealth instead of the guilty individual will merit and get the punishment itself, swift and terrible. Labor controversies are won these days by public approval or lost by public disapproval. The right to work for whom you will and for such wage as you may see fit to accept would scarcely seem to be open to question by any thinking person. Guaranteed by the constitution of the United States the protection of the law is given to those who live within its pale. Either the law governs or else government, law and the entire fabric that civilization has been erecting these hundreds of years is a vain thing and the Red Flag period is indeed here.

The Argonaut editor further says:

"We must destroy the system which is strangling us or it will destroy California. To organized labor as we have had it here and in the shape in which it still urges its pretensions, we must deny the privilege of going one step further. More than this, we must beat it back from the place it holds at the front of our affairs; we must unhorse it at the point of its social and political usurpations; we must force it to take its proper place in the scheme of social order."

We do not think it is necessary to destroy to build up in San Francisco. We have had our fill of destruction in the past fourteen months—let's omit that!

What is needed is to curb and direct not only organized labor but a few—yes at least a few—other things. There are more sensible, hard-headed, honest and reliable citizens among those who compose the organized labor ranks than there are of those who represent all the other classes in that strange body of men and women. The trouble is they are mainly in the ranks, unused to hustling on union matters and disposed to leave affairs entirely with the leaders.

The fact asserted that Mr. Calhoun may have received substantial benefits from a corrupt Board of Supervisors does not in the least grant to organized

labor or their friends collectively or individually, no matter how deep their sympathy or community of interest, any right or privilege, no matter how small, to injure, damage or destroy the property of the United Railroads or to interfere with those persons who desire to work for that corporation or the people who may wish to ride on the cars of the company.

Mr. Calhoun's right, under the law, to pay such wages as his best judgment dictates, is incontrovertible and should be inviolable. If the present disgraced civic administration cannot protect the property of the United Railroads and citizens from molestation and our women from insult, it becomes the duty of Governor Gillett to intervene and with state troops if need be, enforce the laws.

The fact of the city suffering from the chaos reigning in its civic departments is as apparent as the devastation of the burned district was one year ago, and there never was a more unhappy time selected for this strike. Coming on so soon after the other, which so plainly put the carmen in the wrong there can be but little doubt as to the attitude of the general public. The free use of the cars proves this. The matter of police protection has been so quickly disposed of that no one longer asks "can they protect?" but "will they protect?" They have shown how readily they can if the orders to them are right.

These carmen who say they are not drawing the wages of a hod-carrier are the first to lose their battle. By comparison with the extravagant wages of the Building Trades no doubt they believe that they were not getting a just return for their labor, yet they were getting far more than the average of their class in this country. But there is where this strange "San Francisco standard of living" plea comes in again.

Is San Francisco to erect a protection wall all of its own around itself, buttressed on the shoulders of organized labor? To be paid for by capital which can never hope to make a fair return from its investment (so costly would this protection wall make it). A special and peculiar protection that refuses admission as "unfair" to goods made in union factories and shops in other states by union men for union wages,—paying union dues to the same union, and union men here refusing to use their goods for why? "Well they don't cost as much to make as the same goods would if made here and we must protect home industry in order to permit the high standard of living necessary in San Francisco."

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Surplus and Undivided Profits	4,584,805.19
Total	\$10,584,805.19

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As well may the sections of this country that buy our fruit refuse it for the reason that "California has more sunlight and can raise it cheaper than we."

The test of California's fairness and her fitness to be the goal of the home-seeker is to be made in San Francisco during the next few weeks and from the result of the test the State will be judged by the rest of the Nation.

No fiction of the existence of a special "standard of living" can carry weight with the thinking public any more than they will believe there is greater need or more excuse for "French Restaurants" of the unsavory type in this city than any her fitness to be the goal of the home-

places figure in this standard of living? The people are not to be fooled continuously in these matters.

If union labor can come to its senses and reduce the wages to rates that are within reason the town can remain prosperous in the face of general depression and its membership will continue to find work in plenty. But if the desires of certain elements now apparently in control, are carried out, building, together with other improvements will practically cease and San Francisco will remain at a standstill until necessity brings forward other labor and creates new conditions not to be in any way controlled by the present labor leaders, if by labor leaders at all.

X.

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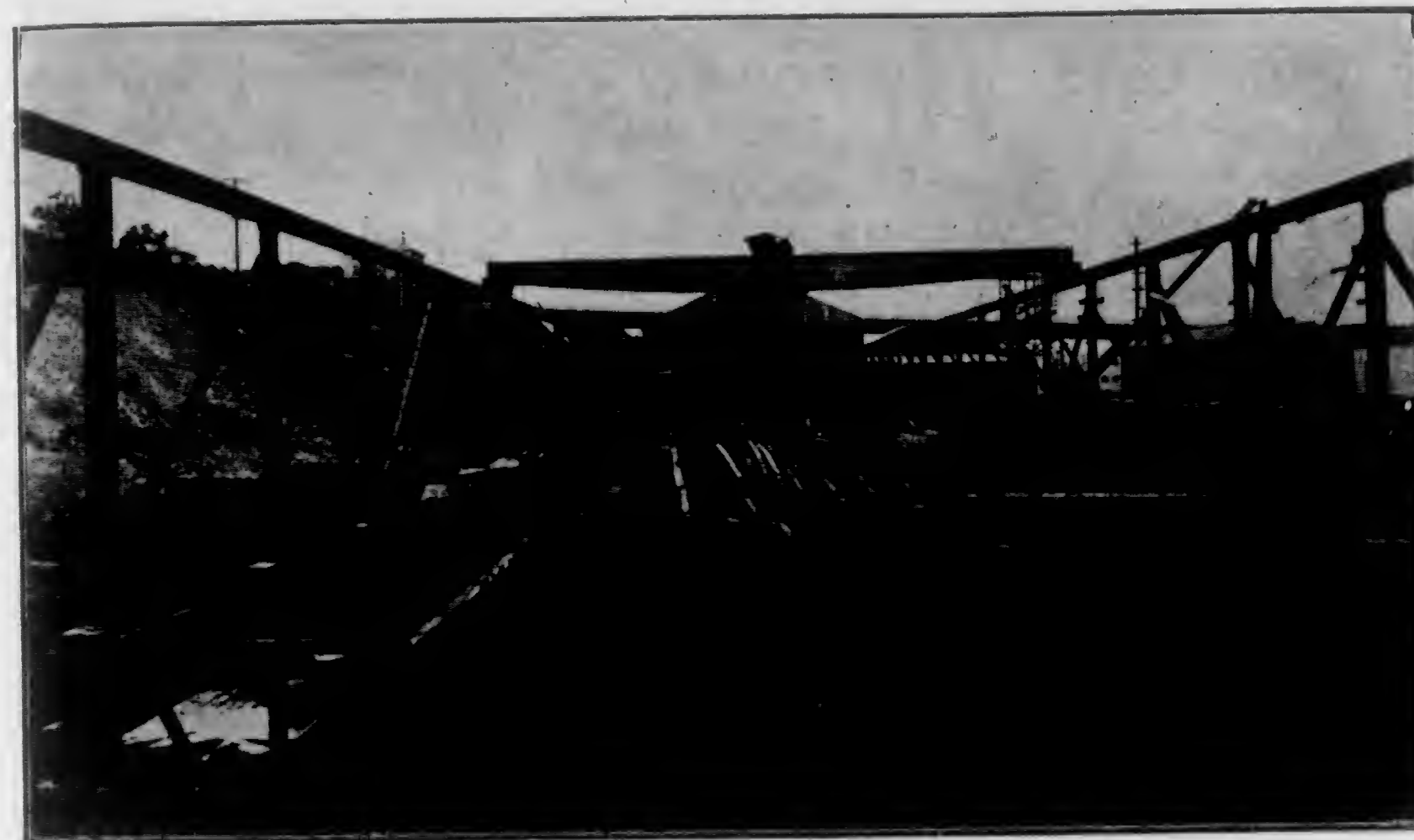
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Ralston Iron Work's Big Crane and Stock Yard

Heating a Modern School Building

In the heating and ventilating of school buildings the California practice has been to a large extent the use of the Sturtevant Plenum Pressure System of ventilating in connection with the furnace system of heating, in which the air is forced over furnaces or air warmers, having extended heated surface so arranged that large volumes of air may be thoroughly heated without super-heating and vitiating any portion of the air. This last requirement, that is, that no air should be super-heated, is of primary importance, as super-heating de-oxygenizes the air and leaves it thoroughly vitiated to be mixed with other volumes of fresh air. The machinery and electric company of Los Angeles have used almost exclusively cast-iron furnaces, so arranged as to have the minimum number of joints, and at the same time to have the parts so designed as to relieve all expansion and contraction strains so as to avoid breakage, or warping.

These furnaces have extended ribs disposed radically so as to increase the radiating surface, and at the same time materially strengthen the structure without increasing the weight.

The particular field for heating and ventilating systems of this type lies in school buildings of moderate size so that the pipe runs are not so long as to permit of extensive radiation between the furnace battery and the rooms to be heated. Where the building covers a

large area furnace heating reaches its natural limitation, due to radiation losses in the conductors.

The furnace method of heating is especially adapted to California, particularly because of the fact that very rarely is heat required during the entire day; as a rule a small amount of heat in the morning, and possibly for a short time in the afternoon is all that is required. The furnace system allows of starting up the plant, and delivering its maximum heat in a very short time after lighting the fires, much shorter than it would be possible with a steam plant where a large body of water would have to be warmed and converted into steam.

In the East where excessive cold requires constant heat during a large part of the school season these advantages are not nearly so marked in favor of the furnace system as in California practice. A very large preponderance of the school buildings on the Pacific Coast, especially from San Francisco south, are installed with some form of furnace-heating system. By reason of the direct use of fuel in heating the air to be warmed the thermal efficiency of the furnace system is exceedingly high.

From what has preceded it will readily be understood that in buildings covering a large area, or in situations requiring heat to be distributed in various places that the flexibility of a steam-heating system in connection with the Plenum System of Ventilation commends itself at once to the architect and engineer. In large buildings of brick, or concrete

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construction, the best practice usually provides for a well designed system of plenum ducts in the basement of the building, opening directly into vertical ducts of the proper size for reaching all of the rooms to be heated. The fans of the centrifugal pressure type are suitably located to maintain a constant pressure on the entire tunnel system, and heating coils are located in suitable groups to furnish the heat in the various groups of risers. Steam is supplied to the coils by way of the usual double-pipe systems, and where power plants are used in connection it is customary to use some one of the different systems of steam distribution to remove the air and condensation and avoid back pressure upon the engine units.

A good example of this type of plant is to be found in the Los Angeles Polytechnic High School, in which the heating and ventilating system and the power plant were installed by the machinery and electrical company after the plans of Architect F. P. Burnham, somewhat modified to permit the use of Sturtevant coils and apparatus. In this installation the entire system was carefully laid out before the construction proceeded and extensive tunnels were provided making a complete plenum chamber. From this chamber the rising ducts connect, being built into the walls so that the minimum amount of galvanized iron work is required. Within the plenum chamber various groups of Sturtevant coils are disposed encased so as to deliver the air over the coils and into the ducts whenever the automatic dampers reduce the pressure in the air ducts to permit of hot air being used. The entire system is installed with the Webster system of steam distribution, and the temperature is controlled by the National System of Thermostats and dampers. Three Sturtevant blowers are installed, two of 140-inch and one 120-inch capacity, with their proper size heating coils. The amount of tem is approximately 80,000 cubic feet at full load.

Bids Wanted for Construction of Bridges

Notice is hereby given that sealed proposals or bids will be received by the Board of Supervisors of Santa Clara county, California, in their rooms in the Court House, in the City of San Jose, up to 11 o'clock a. m., of Tuesday, June 4th, 1907, for the construction of steel reinforced concrete abutments at the ends of the bridge over Los Gatos creek on Park avenue, in accordance with plans and specifications on file in the chambers of the Board of Supervisors.

Notice is hereby given that sealed proposals or bids will be received by the Board of Supervisors of Santa Clara county, California, in their rooms in the Court House in the City of San Jose, up to 11 o'clock a. m., of Tuesday, June 4th, 1907, for the construction of a steel reinforced concrete bridge on Hamilton avenue, over the Los Gatos creek, in accordance with plans and specifications on file in the chambers of the Board of Supervisors.

Pioneers to Build at Once

An application was made the past month by the Society of California Pioneers for a permit to erect a six-story hotel, Class C building, on the southwest corner of Fourth street and Pioneer place, San Francisco. The new building will be erected on the society's old site and will cost \$350,000. The Lindgren-Hicks Company are the contractors.

The Pabst Brewing Company has applied for a permit to erect a six-story hotel, Class C building, on the northeast corner of Ellis and Powell streets, at a cost of \$200,000.

Thomas Magee & Sons have made application for permission to construct a six-story Class C building on Geary street, near Market, to cost \$125,000, from plans by Bliss & Faville.

Other applications were filed by Robert Dalzel, Mission street near Second, \$50,000; Potter Realty Company, northwest corner of Battery and Sacramento streets, \$44,000; A. D. Bretelle, Green street near Hyde, \$11,000.

Some New Buildings

The Brignola Estate Company has begun the erection of a two-story and basement brick building at Sansome and Pacific streets. The Clark Construction Company are the builders. The latter company is also building a five-story brick structure for Kernan and Robson on Geary street, and a brick building on the south side of Sutter street for the Tillman estate.

College Buildings at Pacific Grove

The ground is being cleared on the site of the old Chinatown in Pacific Grove preparatory to the erection of buildings for the biological department of the University of California. Plans are being prepared by John G. Howard, architect. The buildings will represent and expenditure of \$200,000.

Important Decision

In an elaborate decision handed down by the Supreme Court, the judgment of the Police Court of San Francisco in convicting E. C. McMannus of practicing his profession as an architect without securing a license is affirmed. The law was passed in 1901, and the suit was instituted in a friendly spirit to determine the validity of the law. It was contended that the law was unconstitutional, in that it granted special

privileges and immunities to a certain class.

Another Carnegie Library

Architects Marsh & Russell have been selected to draw plans for a new Carnegie Library at South Pasadena. It will be built on the corner of Diamond and Center streets, of brick construction, 46x75 feet, and one story high. It will be modern in every detail.

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Plans for Western Pacific Terminal

Plans are being prepared in Chief Engineer Virgil G. Bogue's office for the ferry mole which the Western Pacific will build on the Oakland water front near the mouth of the estuary.

Contracts for building the ferry boats are to be let shortly, and there are good reasons to believe that Gould's engineers are contemplating entering San Francisco sooner than was anticipated. They admit that work is to be begun in a few weeks on their freight terminals in San Francisco, and the presumption is that the first work to be undertaken will be on the tunnels between Ninth and Brannan, and the next on the freight slips near the sugar refinery.

Track laying is being rushed all along the Western Pacific line. The tunnel at Niles, which is nearly a mile long, is half finished, and by the time it is completed the Western Pacific will be ready to run trains to San Francisco from as far north as Marysville. Orders have been given to rush the track laying work at Oroville, Marysville, Sacramento and Stockton.

Oakland Wants New City Hall

Plans for a new city hall for Oakland are assuming definite shape. At a conference of Mayor Mott and other city officials with the City Hall committee of the City Council, composed of Councilmen Pendleton, Everhart, Mullins, Bactus and Ellsworth, it was decided to have prepared plans for a building to cost approximately \$2,000,000. The proposition to sell the present site and to erect the new building on some other property was also discussed, but no definite action in this direction was decided upon.

The building in which the departments of government are housed is entirely inadequate to the needs of the city, and besides this its tinderlike construction exposes the records of the city at all times to danger of destruction by fire. Only a few days ago it became necessary to rent space outside the city hall for the use of the City Assessor and the quarters of the other departments are rapidly becoming too small.

Compromises Suit

Alice McCone has compromised with A. F. Rousseau, the contractor, who she claimed had failed to construct a building for her according to their contract. She agrees to pay him \$19,000 in addition to the \$8000 already paid him and he is to tear down the building and reconstruct it according to contract.

Los Angeles Wants Cement

The Los Angeles Board of Public Works is advertising for bids on 1,280,000 barrels of Portland cement for use in the construction of the Owens river aqueduct. This will be one of the largest contracts ever let by the city. There are two items in the specifications, providing that the contract may be let to one or two bidders. The first calls for 30,000 barrels of Portland cement for aqueduct use. The second calls for all of the Portland cement required, not to exceed 1,250,000 barrels, exclusive of the aforesaid 30,000 barrels.

Depot and Office Building

It is announced in Sacramento that the Northern Electric Company, which is building a system of electric interurban roads to gridiron the Sacramento valley, has secured a long lease on a lot 150 feet square, bounded by Eighth street, Oak avenue, J and K streets, in the heart of the city, and that it will immediately commence the erection of a fine depot and office building. The tenants on this property have been notified to move out.

To Build Power Plant

Willows.—Albert Lindstrom, Charles Glenn and C. R. Wicks have succeeded in interesting capital in the erection of a large power plant at Stony Creek. It is to be ready for operation by the first of next year. The company will be known as the Snow Mountain power and light company. The plant will be located about three miles from Stonyford. The field of this company will be principally Yolo and Colusa counties. The capacity of the plant will be nearly 20,000 volts.

New Theaters for Northwest

Spokane, Wash.—C. E. Bray, of Chicago, personal representative of Martin J. Beck, of the Orpheum theatrical circuit, announces that the company will expend \$175,000 on a new vaudeville house in Spokane this season, also that in the neighborhood of \$1,000,000 will be invested in the five houses to be erected in Spokane, Tacoma, Portland, Seattle and Vancouver. Mr. Bray added that his principal has options on several desirable building sites and that upon his return from the Coast to Chicago the contracts will be closed and work begun soon afterward.

Henry T. Scott, *President*
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been installed, and fire hydrants and connections for fire giants command all the important buildings, so that in case of necessity, an ample supply of water under considerable pressure can be obtained.

The plant as at present built, has provision for a force of about 400 men and is therefore one of the largest manufacturing plants devoted almost exclusively to mining machinery interests on the Coast.

Art Glass Windows

It is an undeniable fact that stained glass windows are becoming more and more a factor in residence decoration.

Great strides have been made in this art and the results are plainly apparent in the magnificent designs that the various manufacturers of stained glass windows are now executing. One of these concerns is the San Francisco Art Glass Company, of 946 Mission street. Some of its recent contracts, especially for church windows, are decidedly beautiful in design and execution. The company has solved very satisfactorily the question which puzzled the makers of stained glass windows for years, namely, the reproduction of flesh tints. Mr. Johnson, the managing head of the company, has spent many years of experimenting to reach the results that have been attained,

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especially in the matter of flesh shades. The latter is obtained by the light being reflected through layers of glass of various tints, the combination of which gives a very life-like flesh color.

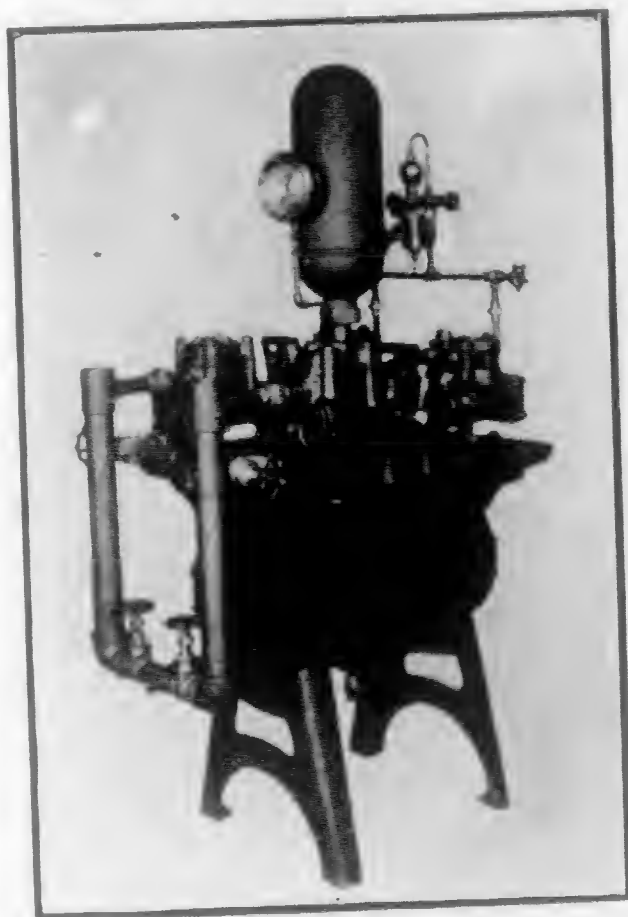
The vault window for Stockton, "The Goddess of Peace," is an excellent example of the class of work turned out by this house. A 12 by 16-foot window of "The Annunciation," for St. Patrick's Church, at San Jose, containing four figures and an immense amount of detail work, is another one of the many contracts that the San Francisco Art Glass Company has lately received.

Honor for San Jose Youth

F. Klein, a well-known San Jose merchant whose famous square furnace is advertised on another page of the Architect and Engineer, is naturally elated over the success of his son, Julius Klein, who graduated from the State University a few days ago with the distinction of being the most brilliant man of his class. Since receiving his diploma his services as a student of history and economics have been called for by the Carnegie Institute at Washington. Klein, while at college, was given the title of "The Boy Wonder."

WANTED—Position as first-class draughtsman. Address, V. Hamborg, 940 York St., San Francisco.

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Back to San Francisco

C. F. Weber & Company have moved back to San Francisco into large and handsome quarters at 1151 Polk street, near Sutter. Before the fire a year ago the company was located on lower Market street. Everything was burned by the conflagration and temporary quarters were procured in Oakland. An attempt was made to induce the company to locate permanently across the bay, but the opportunities in San Francisco were too enticing and the location of the city as a distributing point also proved an irresistible factor in determining the company's future course. A lease was secured of the entire second floor in the New Era building and this has been fitted up for the general offices and sample rooms of the company.

The company claims the distinction of doing the largest business in school furniture of any similar business house on the coast. It also specializes in theater chairs and church pews and seats. It supplied the seats for the new Orpheum, the Van Ness avenue theater, the Globe theater on Mission street and the new Alcazar. It furnished the furniture for the Congregational church at Post and Mason streets, the first edifice to be occupied in the burned district since the fire. The building is equipped with seating accommodations for 1000 persons.

The company occupies one of the largest warehouses in San Francisco, covering a space of 20,000 square feet. Spur tracks of the Southern Pacific run close to the building, which insures prompt shipment of goods.

Sidewalk Light Specifications

Messrs. John McGuigan & Co., the Sidewalk Light and Fire Proofing contractors of 1913 Mission street, near Sixteenth street, San Francisco, request us to publish the accompanying specifications for sidewalk lights, which they re-

commend to be the best at any price.

Specifications—

Sidewalk or vault lights are to cover spaces as outlined on plans.

The frames or bottoms to be of cast iron.

Frames to be properly set on the steel beams or concrete arches, placed for that purpose by other contractors.

All metal work to be painted on the exposed surfaces with two coats of white lead and oil.

Lenses to be 2½" circular, plain.

Concrete filling between the lights to be done in the most approved manner with the best materials.

All the work to be pointed up at completion and guaranteed watertight for one year.

If extra heavy plain lights are required then insert:—"lenses to be 2½" circular by 1¼" thick."

If part refracting lights are required then insert:—"lenses to be 2½" circular, one half plain and one half pendant, prismatic, refracting, placed so as to obtain the best results."

If all refracting lights are desired then insert:—"lenses to be 2½" circular, pendant, prismatic, refracting, placed so as to obtain the best results."

John McGuigan & Company, state that they have made complete arrangements to take care of the prospective demand for their line of goods, with especial respect to the above described sidewalk lights.

Solar Heater Patent Suit Won by The Solar Heater Co., of Los Angeles

In the United States Court recently Judge Olin Wellborn gave a decision in the patent suit of Charles L. Haskell of the Solar Heater Company of Los Angeles, Manufacturers of the Climax and the Improved Climax Solar Heaters, against the Rice Manufacturing Company of Los Angeles and Michael F. Cuniff of Riverside, in which he sustained the valid-

C. F. WEBER, PRES.	J. W. FRICKE, VICE-PRES.	C. C. MCNEILL, SECY.
C. F. WEBER & CO.		
SCHOOL, CHURCH, BANK & LODGE FURNITURE, OPERA CHAIRS, POST OFFICE CABINETS, SCHOOL SUPPLIES		
ALSO LOS ANGELES, CAL. CHICAGO, ILL.	1151 POLK ST., COR. SUTTER SAN FRANCISCO, CAL.	


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ity of the patent of the plaintiffs. Judgment was ordered for the plaintiffs and the injunction asked for was granted. The amount of damages for infringement will be adjudicated later. The suit has been pending for several months and many thousand dollars are involved. There are a large number of the solar heaters in use throughout Southern California, and the number is constantly increasing. The Solar Heater Company also have the right of the circulating system by which the Solar heater can be connected to an artificial heater so that in foggy, cloudy or rainy weather hot water can be obtained.

A New Vitrified Paving Brick Plant

Vitrified brick are rapidly coming into use as a material for surfacing streets and property owners are advocating their use in the place of asphalt.

At the present time there is an immense amount of street paving in contemplation and the adoption of this class of material for the purpose will be met by the paving brick manufacturers. The Simons Brick Company of Los Angeles has placed an order with an Eastern firm for a large consignment of machinery, specially built for the purpose, which they will add to their brick making plants.



Eugene Dietzgen Co.

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Instruments

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Blue Printing

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WATER CLOSETS

That CANNOT Wear Out

"ELK" "EAGLE"

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Gives Better Service

THAN ANY OTHER ROOFING because it possesses highest fire-resisting properties and is wind, moisture and weather-proof.

Costs Less

THAN ANY OTHER ROOFING because it is the "cheapest per year roofing" on the market; coating or painting not being necessary to preserve it.

Write for Samples and Catalog

H. W. JOHNS-MANVILLE CO.
180 Second Street, San Francisco

Superior Brick and Cement Coating

Concrete as a building material is being used to a very great extent, but it has the drawback from an artistic standpoint that it is monotonous and in large masses has tendency to show discolored streaks owing to dirt or varying colors in the ingredients.

This often occurs if work on a wall, for instance, is stopped and later continued; the two pieces of work do not match in color.

Bay State Brick and Cement Coating as a paint or coating will make the concrete most pleasing in light and color effect.

The Klatt-Hirsch Company of 113 Front Street, San Francisco, has taken the agency for Bay State Brick and Cement Coating, a special feature of which is its fire-proofing qualities.

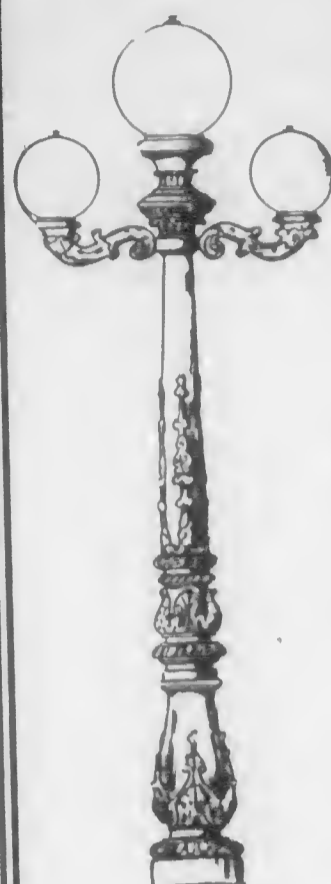
It may be applied to brick, plaster and stucco work besides concrete and to cement floors where it acts as a filler and a surface finish, preventing all powdering of the cement, thus doing away with the dust that a cement floor always carries, and making a finish that may be washed without injury. It is sanitary, and at the same time a protection to the cement, and is easily renewed.

It is of great value where there is much dampness, as it does not peel and it keeps out the moisture.

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Streets of Oakland, San Francisco and Berkeley are the best evidence of the character of my work.

Electroliers for Streets and Buildings.

Estimates furnished.

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PICTURE MOULDING
ART GLASS DECORATIONS

W. W. TUCKER

House

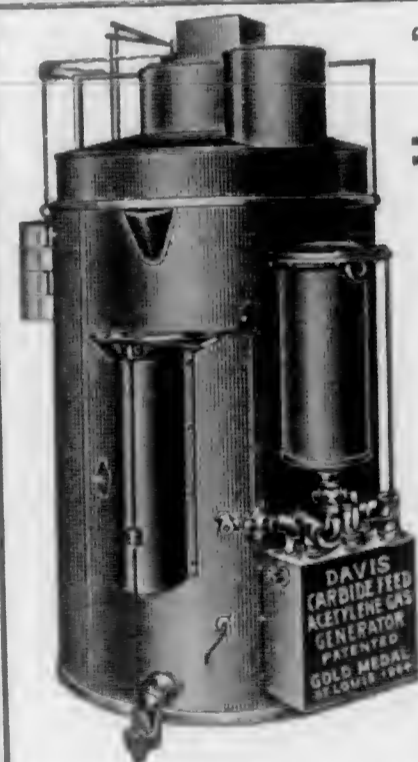
Painting, Paper Hanging and Decorating

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The DAVIS

Acetylene Gas Generator

JUST THE THING FOR LIGHTING COUNTRY RESIDENCES

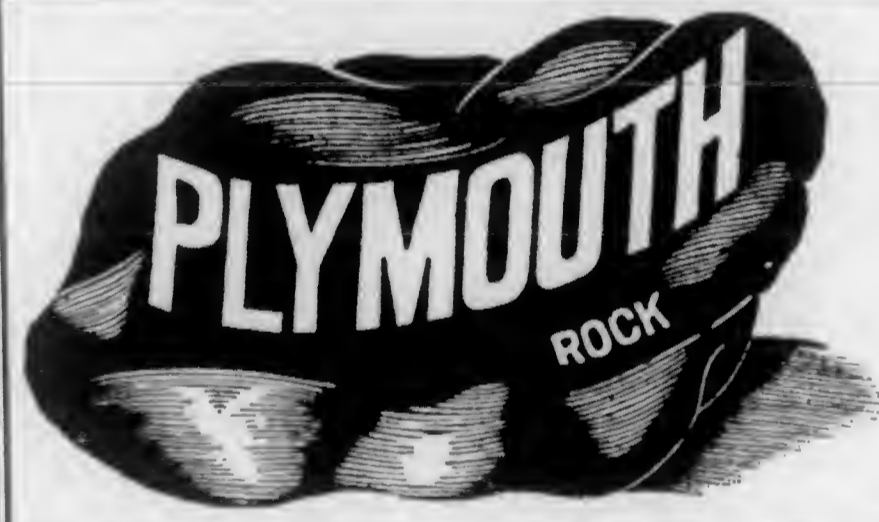
Easily Operated! Perfectly Safe!

A Standard Machine at a Moderate Price.

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Hard Wall AND Wood Fibre PLASTER

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PHONE MARKET 2371
WAREHOUSE: 111 Townsend St., near 2nd.

SAN FRANCISCO, CAL.

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Pumping Engines for Elevator Service

In view of the large number of elevators installations which undoubtedly will go into the new buildings projected for San Francisco, it may be of interest to Architect and Engineer readers to become familiar with some of the later designs in pumping engines suitable for hydraulic elevator service. In the East it has become quite universal to do away with the old compound direct acting pumping engine which, on account of its low economy, is so expensive to maintain, not to mention its poor regulation, and to substitute for this, either a cross compound Corliss pumping engine or a three-cylinder compound Corliss pumping engine. In the latter case there are many advantages over the two-cylinder compound. The three-cylinder type is best adapted for elevator service, owing to its great flexibility and its absolute self-starting features, which allow a uniformity of water flow with a resulting freedom of discharge lines from pulsation that is so essential for first-class elevator service.

The three-cylinder engine is practically noiseless, which is a very superior feature in large buildings, where all sounds are easily transmitted. Because of the shorter intervals between starting points and the higher steam cylinder ratio permissible an engine of this type is completely self-starting without excessive receiver drop and without curtailing the number of expansion available.

With a cross compound fly-wheel pumping engine and both of the engines mentioned above are of the fly-wheel type, the minimum flow is only about 54% of the maximum, while in the three-cylinder type, the minimum is about 74% of the maximum, which has a very great effect on the noiseless operation.

The engine frames are designed after the rolling mill or heavy duty type and the whole machine is put up in a first-

class manner, which is so necessary to continuous operation; and with all, this engine occupies less space than the ordinary cross compound crank and fly-wheel pumping engine of equal capacity.

On another page is shown a cut of one of these engines, also a list of some of the buildings in the East where they are in use, and at all times the manufacturers will be glad to furnish specifications and estimates on this type of machine, knowing full well that any purchaser will be amply repaid for the slight difference in price between this and the cross compound type. The engines are manufactured by the Platt Iron Works, whose Pacific Coast office is in the Monadnock Building, San Francisco.

The Very Latest—Hausmann's Sash Carrier

The up-to-date architect is always alert for something new. The Hausmann Sash Carrier is new. It consists of a hardware attachment to windows, by means of which both sashes can be turned inwardly, thus permitting the cleaning of the outside of the glass from the interior of the room, and in this manner, doing away with the greater part of the labor, and eliminating all risks to life attached to the old-fashioned way of washing windows.

It is the only permanent window supplement on the market, which affords the turning unwardly of the sliding sashes without requiring the cutting of the stiles of sashes and thus insuring against their impairment by the weather—the principal requirement of a window. A number of leading architects and builders have already given it their unqualified indorsement.

The Hausmann Sash Carrier Company has opened offices in the Central building at Polk and Sutter streets, where two excellent models are on exhibition.

PHONE FRANKLIN 2953



THE HAUSMANN SASH CARRIER

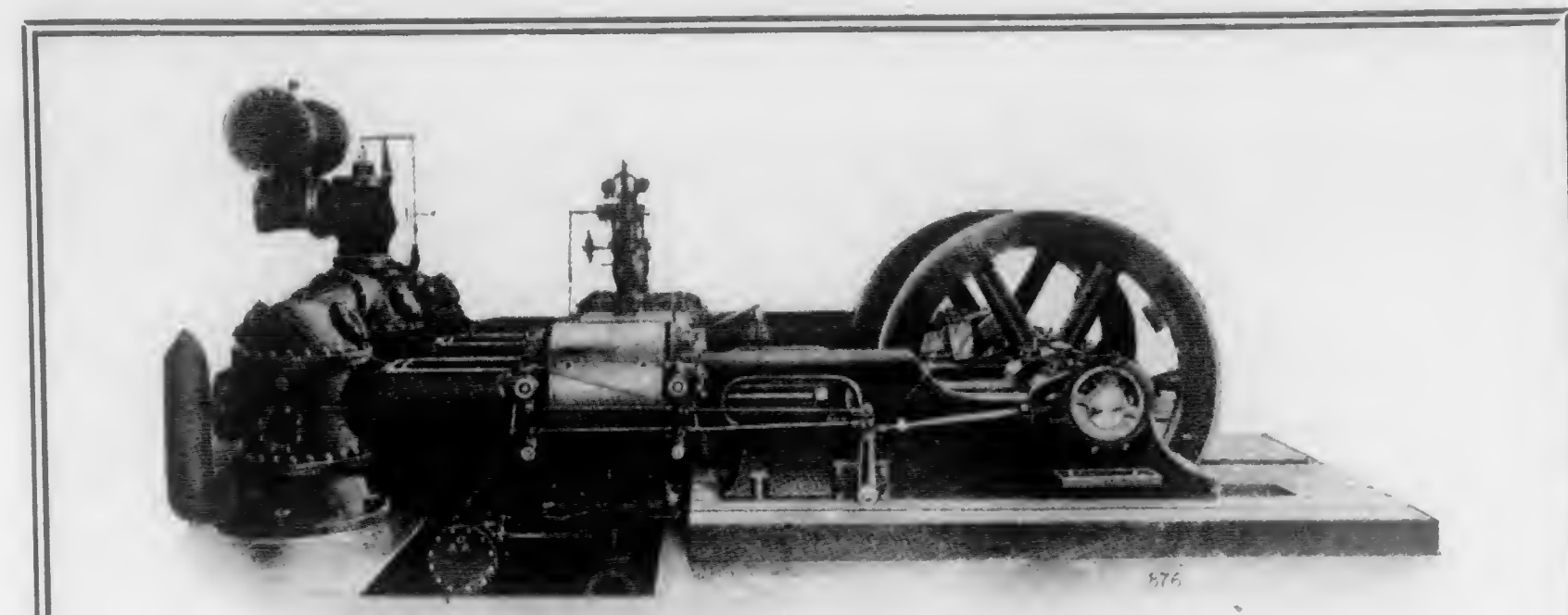
A PERMANENT ALL-HARDWARE SUPPLEMENT TO WINDOWS

Hausmann Sash Carrier Co.

PATENTEES AND SOLE MANUFACTURERS
CENTRAL BLDG., COR. SUTTER AND POLK STS.
SAN FRANCISCO

Window Cleaning Made Easy

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HIGH DUTY PUMPING ENGINE

Multi-Expansion Corliss Type

FOR ELEVATOR SERVICE

MADE BY

The Platt Iron Works Co.

DAYTON, OHIO

San Francisco Office, 822 Monadnock Building

The above Illustrated Engine is the highest type of Pumping Engine for Hydraulic Elevator Service, and we have furnished them for the following buildings:

- COMMERCIAL NATIONAL BANK BUILDING. - CHICAGO
- MASONIC TEMPLE. - - - - - CHICAGO
- WEST STREET BUILDING, - - - - - NEW YORK
- FISHER BUILDING, - - - - - CHICAGO

ALSO MANUFACTURERS OF

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—FOR—

WATER WORKS OR ELEVATOR SERVICE

FEED WATER HEATERS

AIR COMPRESSORS

CONDENSING APPARATUS

WATER WHEELS

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EVERYBODY KNOWS THE ROOKWOOD
IT IS NOT EXPENSIVE ££ ££ ££ ££

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Empire Plaster Company

Manufacturers of Hard Wall Finishing
and Dental Plaster

SPECIFICATIONS FOR EMPIRE HARD WALL PLASTER

Metal lath three-coat work:
First or scratch coat—One part Empire hard wall plaster fibred, two parts sharp clean sand (fresh water sand preferable). Thoroughly mixed and applied within two hours after mixed.
Second or brown coat—One part Empire hard wall plaster, two parts clean sharp sand floated up even with grounds.
White or putty coat—One part Empire finishing plaster, three parts line putty gaged with hard wall plaster.
Sand finish—One part Empire hard wall plaster, two parts clean sharp sand.
Wood lath, two-coat work—One part Empire hard wall plaster fibred, two parts clean sharp sand (fresh-water sand preferable), mixed thoroughly and applied within two hours after mixing.
White coat and sand finish same as for metal lath.
Finishing coat should be applied within 48 hours after first coat is put on.

16th and Harrison Sts., San Francisco
Oakland Warehouse } ADAMS' WHARF
Phone Oakland 6821

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ASK YOUR NEIGHBOR ABOUT THEM

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ABSOLUTELY RELIABLE

WHY let the sunshine go to waste, and your money too, when at trifling expense you can put in your home an IMPROVED CLIMAX SOLAR HEATER that will furnish hot water from sunshine alone—winter and summer—for your bath, laundry, and all domestic purposes, without cost, damage or delay?
It can be connected with the range, furnace or gas heater to insure hot water on rainy days, and when so connected saves the expense of a kitchen boiler.
It insures a cool house during the hot season. Let us figure with you on your hot-water problem.

SOLAR HEATER COMPANY

342 New High St. LOS ANGELES

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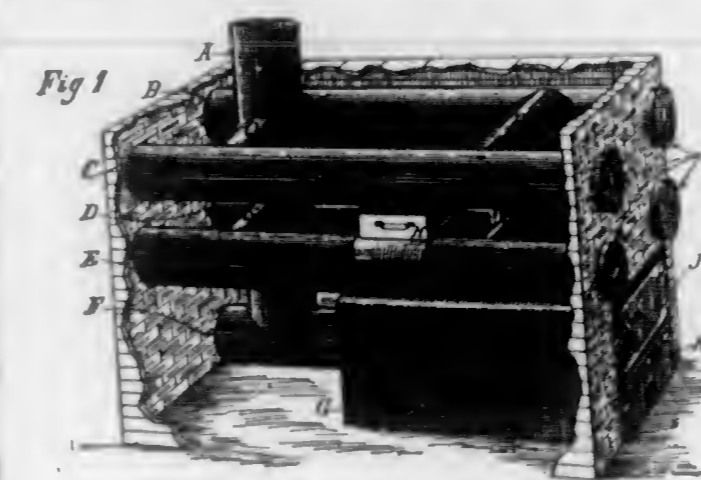
You can save money

On every concrete structure—by using



Sullivan's
All Steel
Plank Holder

Sullivan's Plank Holder does away with nailing and makes the use of lumber again and again, possible. This device, which is patented, is easily and quickly applied and removed and saves its cost over and over.—Other contractors are saving money by its use. Are you? WRITE FOR BOOKLET
J. H. SULLIVAN, 444 Norris Bldg., Grand Rapids, Mich.



This Is It

The KLEIN Furnace

"BUILT SQUARE"

Especially Adapted for Dwelling Houses,
Churches, Schools and Halls

Clean, Reliable, Simple, Economical

Architects and Builders Investigate This.
Write for booklet entitled, "A Square
Talk on a Square Furnace."

F. KLEIN

53 South Second St., San Jose, Cal.

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In quantities to suit,
for immediate and
future deliveries. . .
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quirements see or
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Cement
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Pig Iron
Coke, Etc.

G. W. McNEAR

210 BATTERY STREET

San Francisco, Cal.

ROOKWOOD TILE

EVERYBODY KNOWS THE ROOKWOOD
IT IS NOT EXPENSIVE ££ ££ ££ ££

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CALIFORNIA AGENTS

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SPECIFICATIONS FOR EMPIRE HARD WALL PLASTER

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First or scratch coat—One part Empire hard wall plaster fibred, two parts sharp clean sand (fresh water sand preferable). Thoroughly mixed and applied within two hours after mixed.
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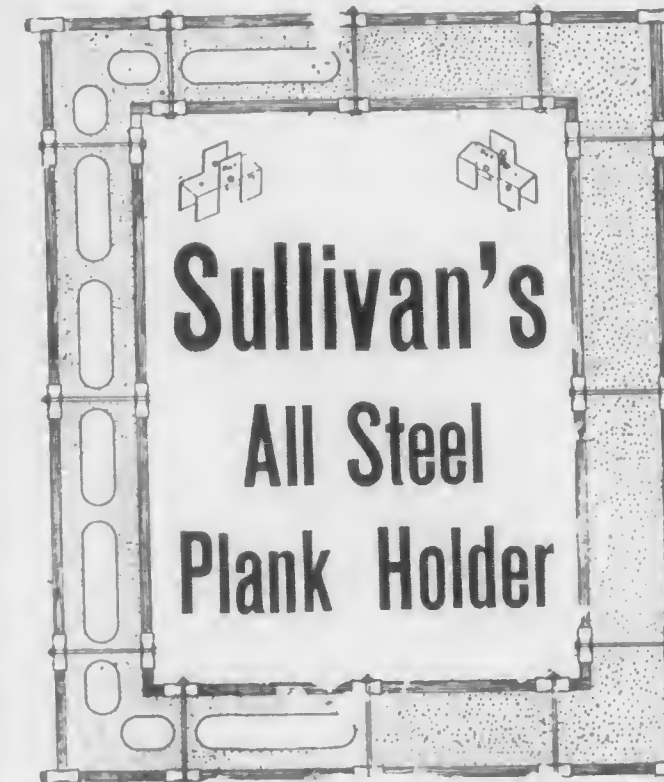
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You can save money

On every concrete structure—by using



Sullivan's
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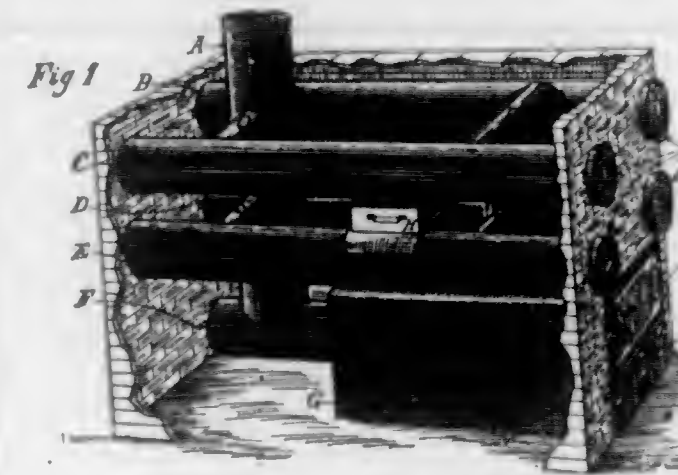
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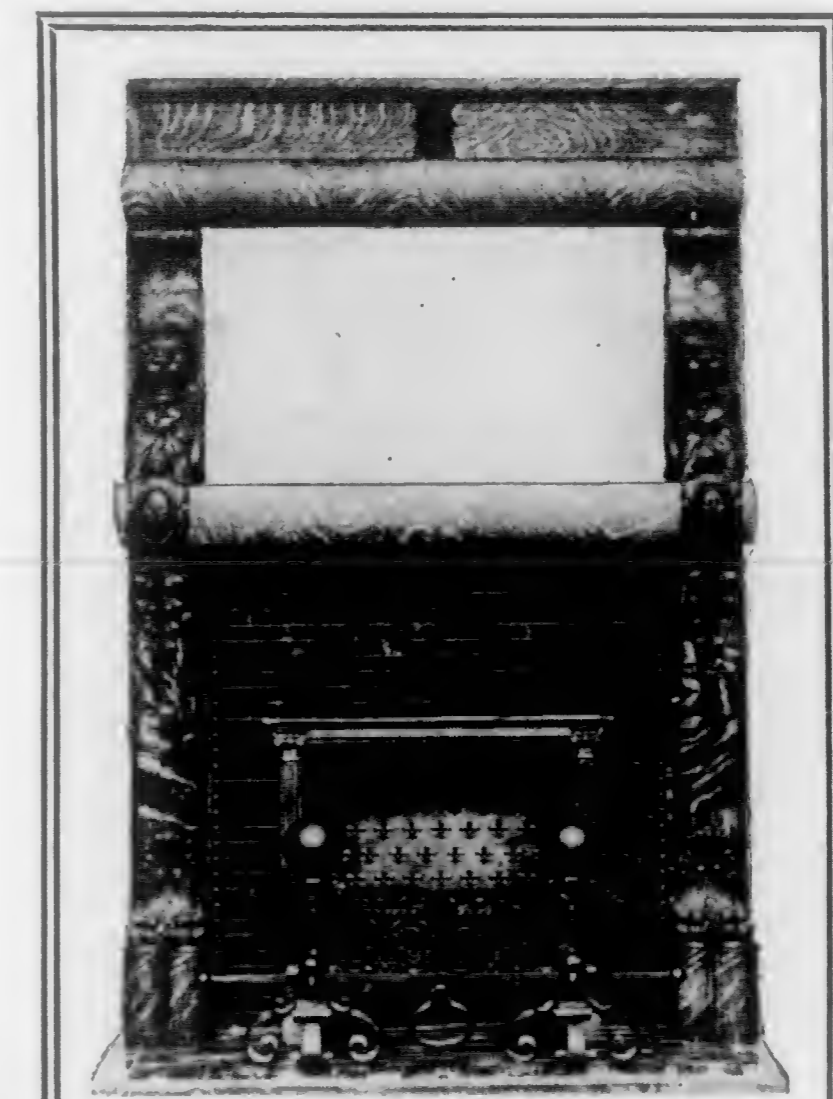
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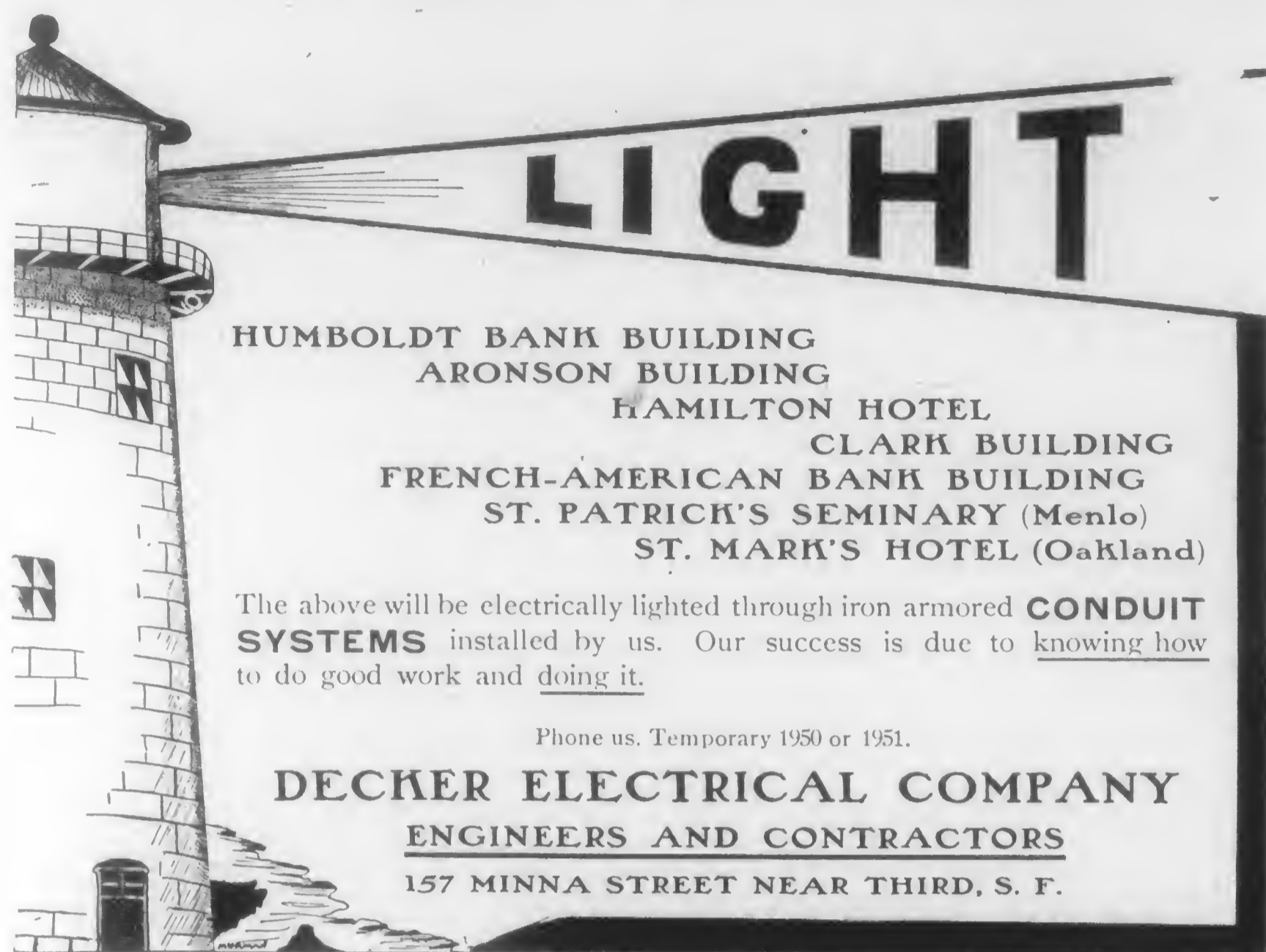


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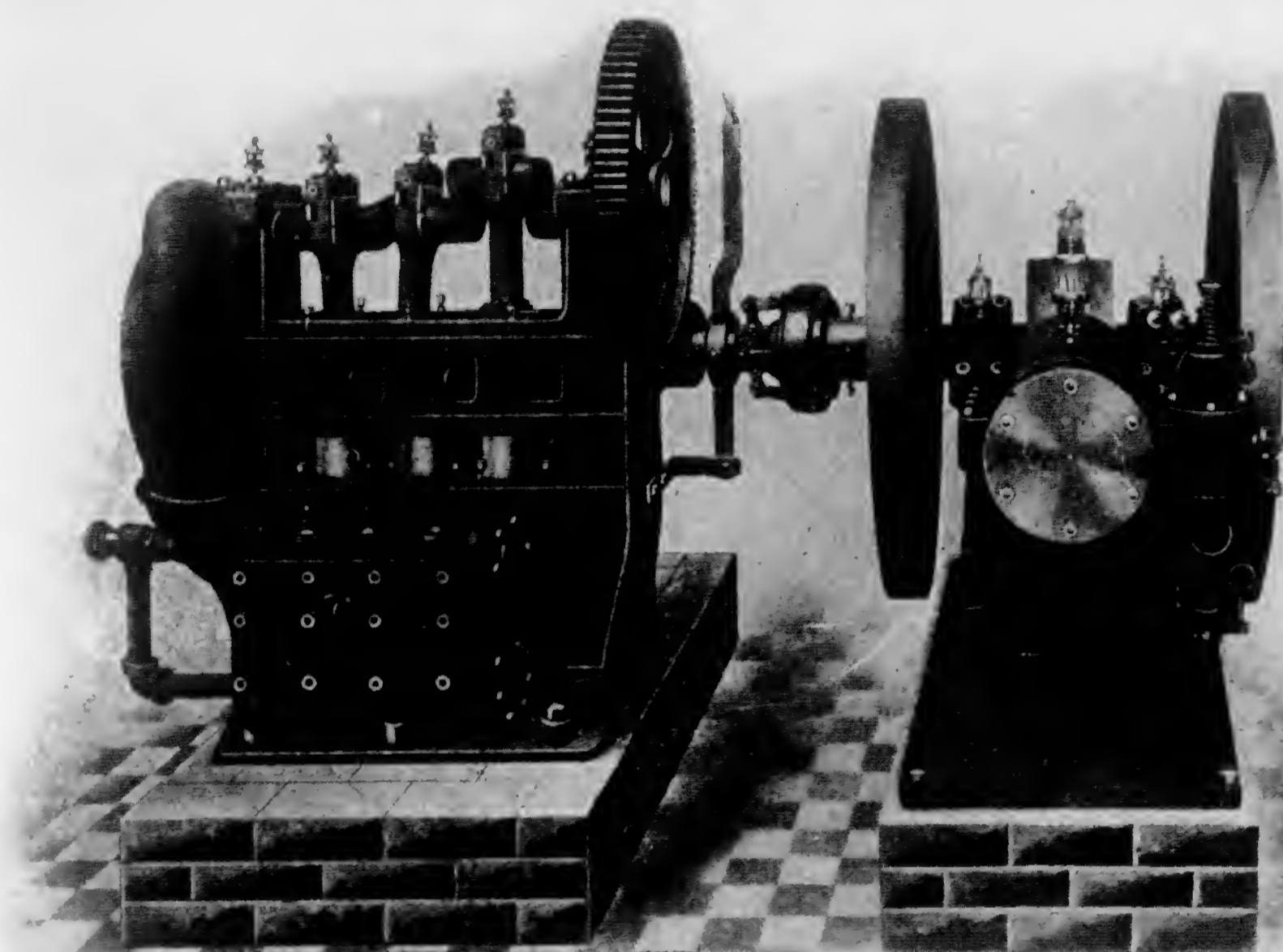
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Steamer trip adds no more to cost than
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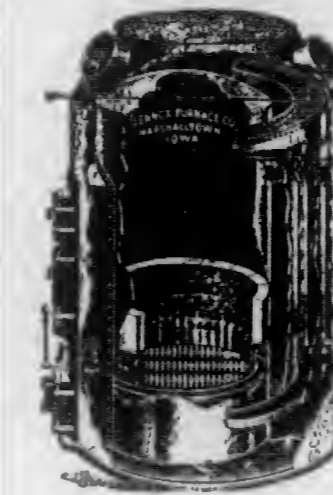
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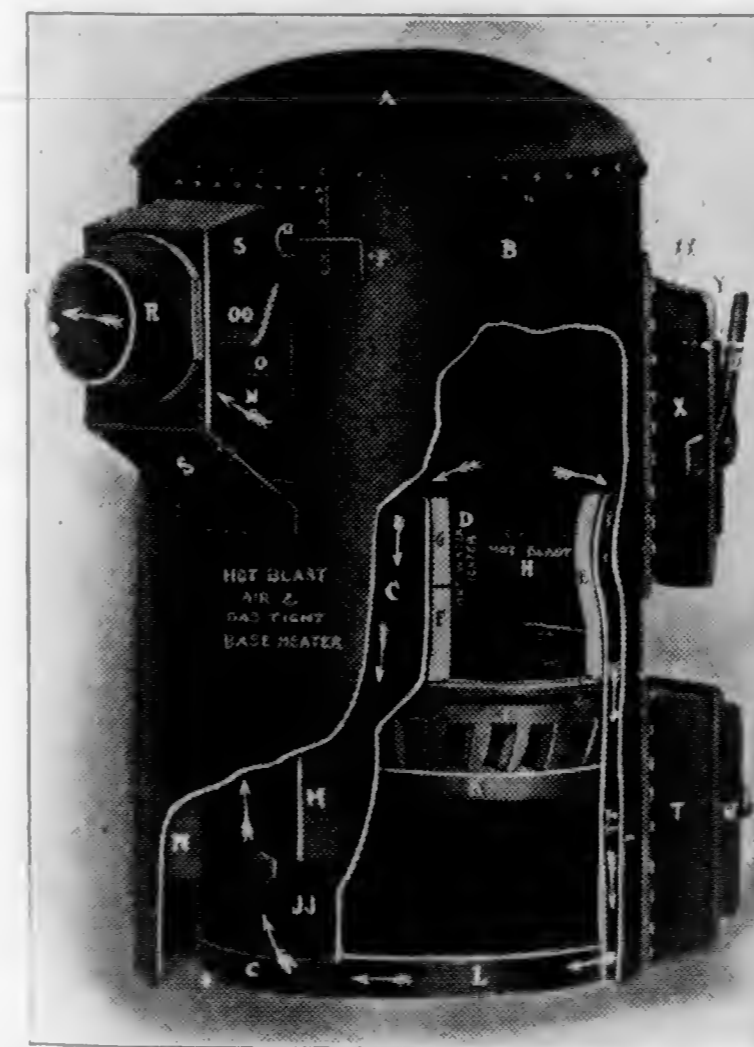
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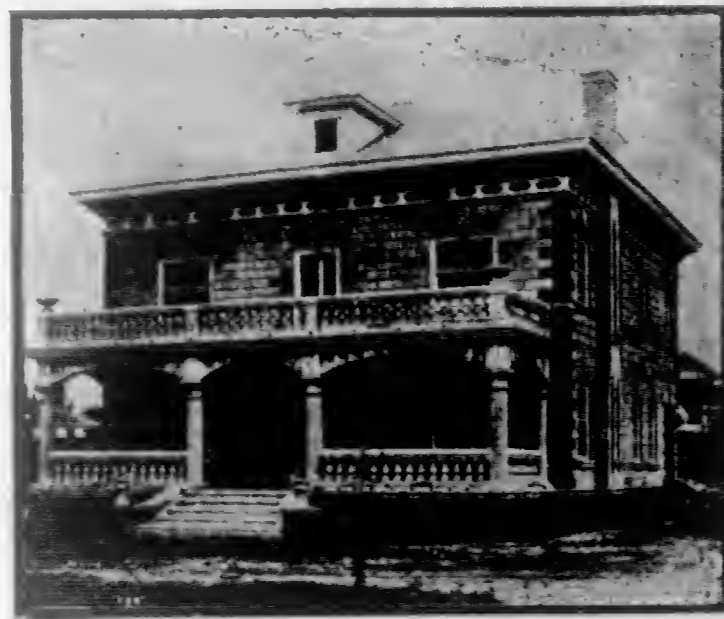


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Anywhere in the State; also Reinforced Concrete
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As necessary to modern building
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Admit perfect ventilation
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¶ Sand-Lime Brick is fast being adopted by American Builders because of its various merits and advantages. ¶ The first successful System of Manufacture, Developed in Germany, and the Only One based on Perfect Scientific Principles is the *Schwarz System*. ¶ Western America offers Splendid Industrial Opportunities in the Establishment of Sand-Lime Brick Plants. ¶ The Patents for the *Schwarz Scientific System* west of the Mississippi are controlled by the

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and are Superior to any on the
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MANUFACTURER OF—
For making Artificial or Concrete Stone. FACE-TAMP and SIDE-TAMP MACHINES.
Adjustable to any size. HOLLOW CONCRETE FENCE POST MACHINE—The best
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JUNE SUNSET

HOW the New City under the impetus
 of the rapid rebuilding is moving
 south, filling the entire peninsula, being
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The Bay Shore Railway Cut-off

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Send it to your Eastern Friends
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 Dealers in Oils, Mixed Paints, Copper Paint,
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 We are prepared to Contract Work
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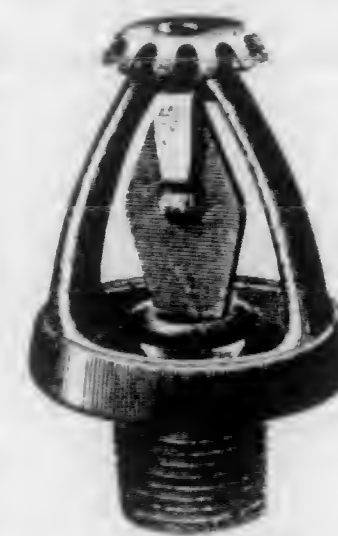
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 Plate, Window, Prism
GLASS
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 Boiler Settings and Brick Work
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Granolithic Steps, Buttresses, Posts, Columns, Caps, Wainscoting
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During the past two years manufacturing plants with an aggregate of over 30 acres of floor space have been built according to the Kahn System of Reinforced Concrete, for the automobile industry alone.

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The Kahn System is a method of building based on organized engineering skill, experience and facilities for meeting every requirement of Reinforced Concrete Construction in the most economical and efficient way. We insure quality and prompt delivery by manufacturing our own reinforcing material, including the patented Kahn Trussed Bar, Kahn Expanded Metal, Cup-Bar, and Kahn Metal Lath.

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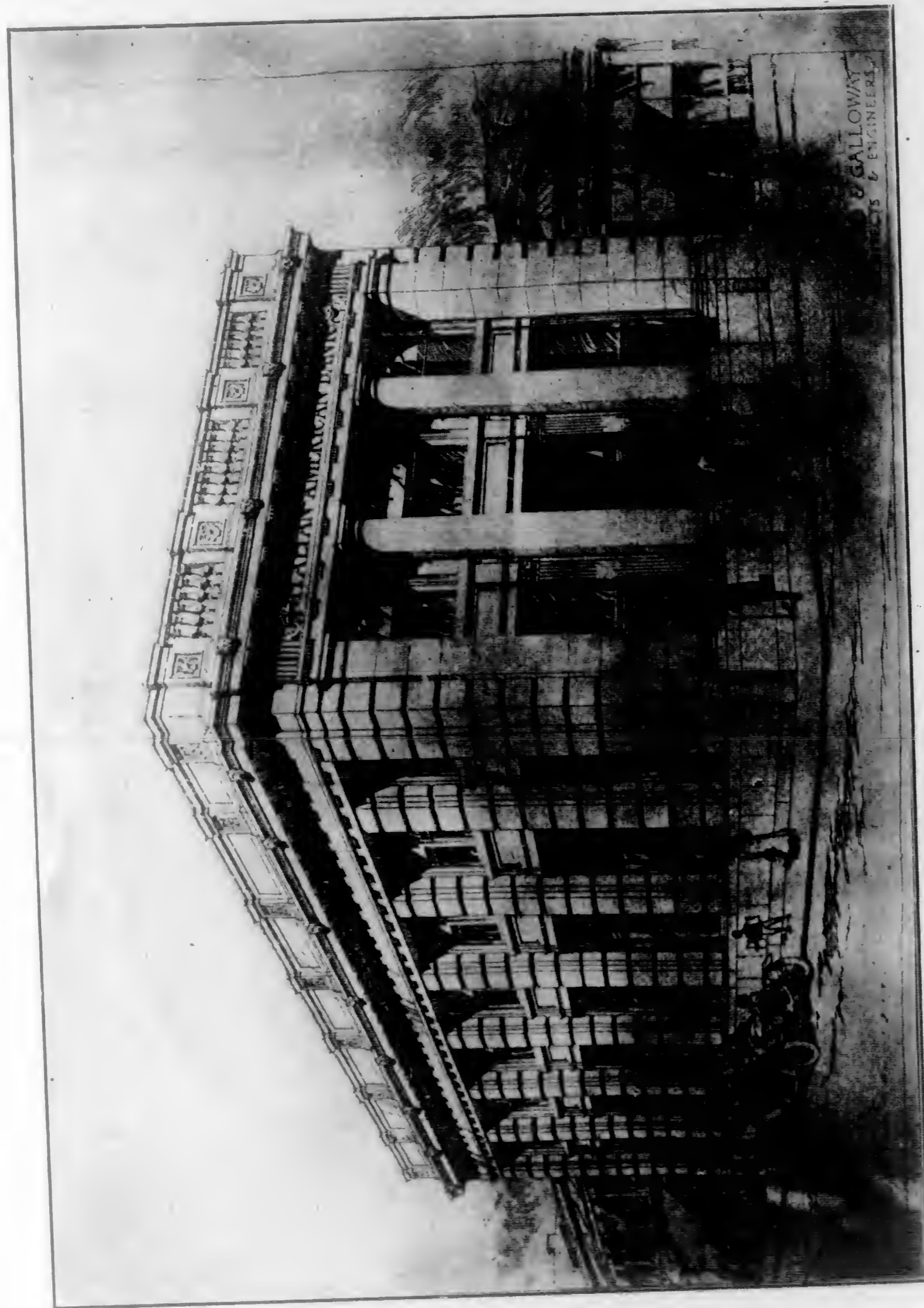
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*Italian-American Bank Building, San Francisco
John D. Galloway, Engineer
John Galen Howard, Architect*

1-35 *Admission*

THE
Architect and Engineer
Of California

VOL. IX.

JUNE, 1907.

No. 2.

The Italian-American Bank Building
Of San Francisco

JOHN GALEN HOWARD, Architect

JOHN D. GALLOWAY, Engineer

PRACTICALLY every bank in San Francisco has begun or will soon commence the erection of a building of its own. Before the fire only a few of the big financial institutions occupied their own property. As a result the banking quarters were not particularly imposing. Every bank in the city suffered by the fire, some more than others. Those obliged to rebuild have spared no expense in planning something substantial as well as ornate for the New San Francisco.

From plans by Howard & Galloway, architects and engineers, the Italian-American bank is erecting on the southeast corner of Montgomery and Sacramento streets, a substantial home of steel, reinforced concrete, brick and granite. The old building was a seven-story brick structure with banking quarters on the ground floor and offices above. There will be but two office floors in the new building.

The steel frame and most of the concrete work is finished. The front walls are to be faced with California granite and backed with brick. The building will have a frontage of $42\frac{1}{2}$ feet on Montgomery and 103 feet on Sacramento street, with an ell extending back from Sacramento street, 137 feet. The main portion of the building will have a height of 41 feet (2 stories) and the rear ell will have a height of $50\frac{1}{2}$ feet (3 stories). The rear walls of the building which are of reinforced concrete contain more material than the front.

A basement extends under the entire building. The bank will occupy all of the first floor and basement of the main building, except that part facing Sacramento street, and directly in front of the rear ell. A store facing on Sacramento street will occupy the remainder of the ground floor. The second and third floors will be used for business offices. The floor of the banking rooms is of white Italian and Verde Antique marble. The counter partitions, screen work and wainscoting are of white Italian and Verde Antique marble and bronze.

A new vault having three floors will be built. The walls, doors and

ceilings of the vault will be 12 inches thick. The vertical walls of the vault are to be reinforced with half-inch square corrugated steel bars placed nine inches apart in double rows. The vault floors are reinforced by light railroad rails in addition to a double layer of corrugated bars. The offices on the second and third floors will have metal lath and cement plaster partitions. In order to leave the banking space in the first story entirely free from interior columns it was found necessary to suspend the second floor from a series of trusses. There are six trusses each with a total length of forty feet and a depth at the center of eight feet.

The granite walls to the front are massive and will be anchored to the steel frame so as to withstand earthquake shocks if necessary. One of these anchors is an angle iron extending along the entire length of the heavy granite parapet wall near its top. All the rear walls of the building are of reinforced concrete supported, above the second floor, on the steel frame. These walls have both vertical and horizontal reinforcement. The steel framework will be encased in concrete to a depth of two inches. The protection of the columns, however, will be 4 inches thick. The sloping roof of the building will be formed of a concrete slab over which asbestos shingles will be laid. The greater portion of the concrete foundation of the old building will be utilized.

* * *

The Question of "Cheap" Paints

ALL things considered, there is nothing to fear from the price cutter, says an exchange, in an article on maintaining the price of paints. He cannot adopt such tactics and hold his trade, because he is in no better position to do business without profit than you are, and if he is supplying inferior paints his customers will very quickly find it out and go elsewhere in the future for paints, and whatever else that dealer sells. The average purchaser of paint wants to get the most value for his money possible. In other words, he wants to get his house painted for as small an expenditure as he can. It is a simple matter to demonstrate to him that a good paint, costing from \$1.60 to \$1.75 per gallon, will save him at least one-fourth the cost were he to use any of the cheap paints that sell for a few cents less per gallon. Once you have shown him the difference in the cost per year between a good paint and the cheap ones, it is a simple matter to get his business. We all know that a good paint, when applied under anything like favorable conditions, will wear from five to eight years, while the cheap paints are doing excellent service if they stand the weather for three years at the most before it becomes absolutely necessary to repaint the house.

* * *

Not for Him

An Irishman one time thought he would spare enough money for a chicken dinner. So he hied himself to the nearest restaurant and proceeded to order his dinner.

"O'i'll have chicken," said Pat to the waiter.

"Would you like it smothered in onions, sir?" asked the waiter.

At this, Pat, with a crash of his fist on the table, exclaimed, "No, be jabers! Give the poor devil a chanst. Wring his neck."

Labor Unions--Their Rights and Duties

By H. W. POSTLETHWAITE

THE fundamental principle and indeed the "ratio vivendi" of labor unionism may be summed up in the phrase—"The injury of the one is the concern of all." The true functions of labor unions are:

First. To protect and safeguard the interests of the union as a whole and of the members individually by every fair and legal method in their power.

Second. To increase the efficiency of labor and thereby render the members entitled to a higher rate of wage proportionate to the increase in output.

Third. To encourage the young men and boys of the country to learn and master a trade and thus fit themselves to ultimately become skilled artisans and useful members not only of their union but of the community in general.

Fourth. To insist upon efficiency in the members and to so regulate the training of the neophyte that every trade may be well furnished with skilled artisans who will on account of their efficiency be preferred by employers to any artisan not a member of a labor organization, thus compelling by force or virtue of merit every laborer and artisan to become a member of a union.

The internal and external affairs of the union should be managed by an executive or advisory committee in much the same manner as the affairs of an industrial corporation are managed by a board of directors. This committee should be composed of experienced, cool headed, conservative men capable of forming a clear and comprehensive judgment of the conditions they have to contend with; more particularly is this necessary as the chief and most important duty of the committee consists in conferring and negotiating with the employer in regard to wages and terms of employment. If in the course of such negotiations the committee is unable by a fair and legitimate presentation of the case to convince the employer that the demands are reasonable it has the privilege of advising a strike; but in the event of a walkout resulting, the union has no inherent, legal or moral right to attempt to prevent by illegal coercion or by threat of physical harm the employer from engaging the services of others who may be willing to accept the terms and wages offered.

The efficiency of labor could be enhanced by the inauguration of technical and practical schools under the auspices of the labor unions themselves or as a private venture for the education and training of young men and boys desirous of learning a trade, also by encouraging emulation and basing the rate of wage upon the result produced. Men should be paid not for the time they spend, but for the work they accomplish. The piece-work system is based on this plan but has many drawbacks. A plan whereby in estimating work upon a contract and labor cost is kept distinct from every other item of cost has proven satisfactory in several instances where tried and certainly has the merit of equality, a merit not possessed by any other proposed solution of the labor problem.

Under this plan the workmen of every class engaged sign an agreement through their representatives to perform the work at a certain estimated figure mutually agreed upon. The workmen are then paid the regular rate of wages and the difference between the amount paid in wages and the estimated wage cost is either debited or credited as the case may be to the "Surplus Labor Fund." A semi-annual dividend is declared on this fund amounting in some cases to 50% of the regular pay. This result is not obtained through unreasonable exertion on the part of the workmen, but is

due to the fact that they concentrate their mind on their work and pull together. No man can shirk under these conditions with impunity as he will be speedily edged out of the works by his fellow workmen who are interested in his efficiency. This plan would not meet with the approval of the labor union leaders of the present day, as it comes in direct conflict with the union theory that it is the duty of a man to do as little as possible to hold his place in order that there may be more jobs available for other men. An alert and vigorous workman has no legitimate place in an up-to-date union.

The industrial conditions existing in San Francisco today are deplorable and unless some immediate and radical measures are taken to break or at least abate the present anarchical labor rule will inevitably result in the permanent crippling of the city as a central distributing point for the Pacific Coast.

The labor leaders of this city have subverted and prostituted to their own selfish ends the true and fundamental principles of unionism as above stated. They have not the welfare of the workingman at heart, but are continually stirring up strife in order that they individually may continue to draw down their princely salaries. In their ghoulish fashion they thrive and fatten on the troubles and losses of their fellow workmen, who, like unthinking sheep, blindly follow their lead, or if they show any desire to revolt are coerced into submission by threat of bodily injury. These leaders have arrogated to themselves the power of life and death over the members of the union and threaten to wield a like power over those without the pale of the union should they refuse to bow to their will.

The unions of today instead of raising the efficiency of labor have curtailed it in every way possible and in order to insure the employment of the inefficient union men have caused an artificial scarcity of labor and have now practically by illegal and criminal methods obtained a corner on the labor market. Since the organization of labor unions in this country our boys and young men have in many trades been entirely barred from learning the business and in others they have been so restricted that they might as well have been entirely barred out. By union rules even the father has been forbidden to teach his son the trade which his father had taught him. The old time apprenticeships under which the master and the apprentice worked on the same scaffold have passed away through the arbitrary and tyrannical methods of organized labor. All is now changed and most of those engaged in skilled labor are men of foreign birth; and why, because the native-born American boy is not permitted to learn the trade of his father, uncle or elder brothers.

The right of every young man to learn a trade should be free and unchecked (and so it was until the constitution of the labor unions was allowed to take precedence and ride rough-shod over the Constitution of the United States), the disposition to learn should be encouraged, as education is an incentive to good citizenship. It is a reproach upon the fair name of our free country to stand idly by and allow any labor union to dictate what our boys shall do or shall not do. Such rules and restrictions as are laid down by the unions tend to force boys into idleness and to become hoodlums and tramps and finally criminals and outlaws. The policy of the unions is to restrict and curtail the output of the skilled and competent workman so that it will not exceed the output of the most incompetent. The wages demanded, however, are based on the maximum output of the most skilled and competent workman thus smiting the employer fore and aft and rendering it impossible for him to compete successfully with an "open shop" community where the natural law of supply and demand is allowed to govern the rate of wages and where no artificial scarcity of labor is permitted.

To quote William D. Haywood, secretary of the Western Federation of Miners: "Trade unions are nothing more nor less than a labor monopoly. They are trusts just as much as the Standard Oil and Sugar trusts. They attempt to restrict the supply of labor in order, as they think, to hold up wages. Through the apprentice system they are making tramps of hundreds of young men by denying them the right to learn a trade. They attempt to dictate to employers whom they shall hire and how much they shall pay. They do not permit employers to give young men a chance to better their conditions."

Prosperity in San Francisco cannot become permanent so long as labor unions are watching their opportunity to destroy the business of the employer, and it is high time that the laboring men of this city realized the folly of belonging to and upholding organizations whose basic principle is the limitation of apprentices and membership and the restriction of output instead of a recognition of efficiency in the members. The establishment of trade schools under private, or better still, government auspices at which a boy could obtain a practical and technical training in a skilled trade would offset the pernicious influence of the labor unions and would prevent the trades of this country from being monopolized by men of foreign birth. This would insure an equal opportunity to all and a generation of young men would grow up to take the places of and to care for those men now in the prime of life whose usefulness will shortly wane. In conjunction with these trade schools must be an enforcement of the law to insure adequate protection and the full enjoyment of the privileges of individual freedom of action granted and guaranteed by the Constitution of the United States.

The exorbitant cost of building in San Francisco is not due so much to the high rate of wages prevailing nor to the high price of building materials but chiefly to the great decline in the efficiency of labor. Five years ago, for instance, bricklayers were receiving from \$4.50 to \$5.00 per day and were laying from 2000 to 3000 brick per day, according to conditions. These self-same bricklayers are today receiving from \$7.00 to \$8.00 per day, and are only laying from 700 to 1500 brick per day which is equivalent to an increase of 200% in wage cost. A similar decline in efficiency is noticed in all the building trades; the theory of the unions presumably being, "The greater the wage the smaller the output should be."

Last year in the eleven leading cities of the Union 800,000 men were employed in the erection of buildings amounting in value to \$380,000,000. In order to merely restore old San Francisco \$400,000,000 worth of building (this cost is based on the higher efficiency of labor not the present low efficiency) will have to be done. To accomplish this enormous task the unions at this time can only furnish 35,000 men. On this showing it will take twenty-five years to bring San Francisco to her old state. It is generally conceded that this city must be rebuilt in ten years at most, and to accomplish this, 90,000 men will be required—where are they to be obtained—unless all those skilled in building craft whether union or non-union are allowed to assist. If the unions will not permit non-union men to work peaceably and without threat or interference in the reconstruction of our city when they admittedly are unable to furnish the necessary labor required "open shop" must of necessity be declared and enforced and the unreasonable anarchical and criminal rule of unionism must be broken.

* * *

We all know what Harriman would do to the Panama canal to make it practical, if he was in charge. He would stop throwing away money on construction work and just issue watered stock enough to float full sized war ships right over the isthmus.



William H. Weeks, Architect

*Suburban
Architecture*

In California

*The Work of
William H. Weeks, Architect*

*Building
the
Home*

*With Illustrations of
Houses Built by
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Building for E. A. Hihn, Kearny and Bush Streets, San Francisco.
W. H. Weeks, Architect



City Bath House, Paso Robles, Cal.
W. H. Weeks, Architect

Suburban Architecture in California

The Work of WILLIAM H. WEEKS, Architect

WITH the steady growth in population of the central coast cities in California has come a demand for more pretentious and costly buildings. For the last half dozen years there has been a tendency on the part of each town to outdo its neighbor in construction of handsome buildings. It has not been a race for numbers so much as a contest for class. Good buildings has been the key note. By good is meant substantial, well built structures as well as ornate. The municipalities and townships have happily manifested quite as much enthusiasm for fine buildings as the private citizen and merchant. The result is that we find not a few very handsome public buildings, such as city halls, libraries, courthouses and churches, which the big city may have good cause to envy.

Probably no one architect has been more prominently identified with the development and upbuilding of the cities of the central coast counties than William H. Weeks of Watsonville. His work may be found in practically every city and town as far north as San Francisco and as far south as Santa Barbara. Mr. Weeks has been planning buildings in California for nearly ten years and his work has embraced nearly every class of building from the substantial, up-to-date office building to the one story, suburban store; and from the historic mission-style church to the classic Gothic cathedral; and from the modest town hall to the imposing county courthouse.

Schooled to be painstaking and thorough in every detail and with an honesty of purpose to give his clients the best service possible, looking closely after their interests, Mr. Weeks has made for himself a reputation of which he may well feel proud.

Mr. Weeks was born in Prince Edward Island, Canada, in 1866. He received his early education in the Prince of Wales College of Charlottetown. His ability as an architect comes natural, as his father was a prominent architect and builder who stood high in his profession in Canada, where for many years he held the position of Superintendent of Public Works.

In 1880 Mr. Weeks moved to Colorado where he took the architectural course at the Brinker Institute of Denver. This, in addition to the exper-



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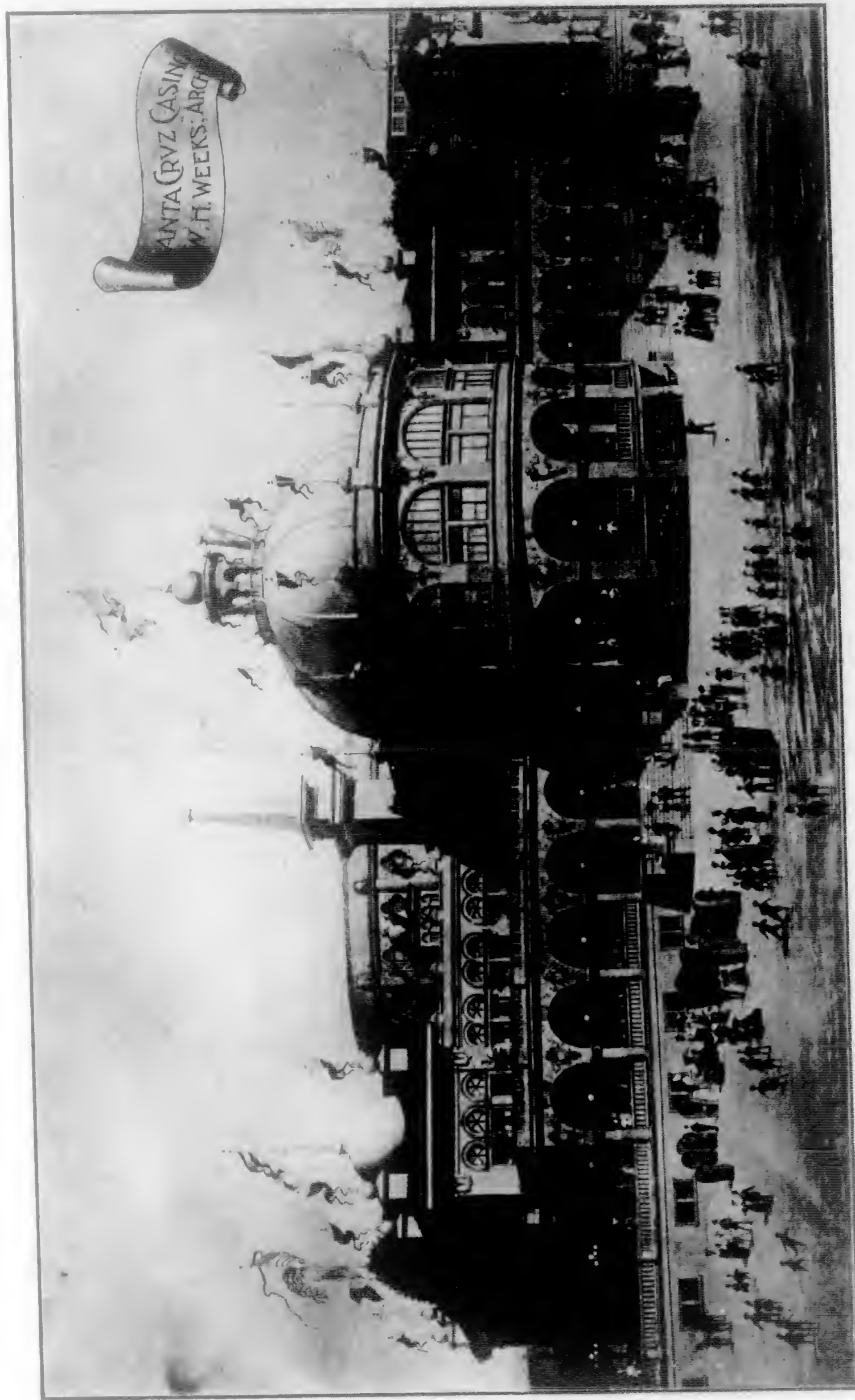
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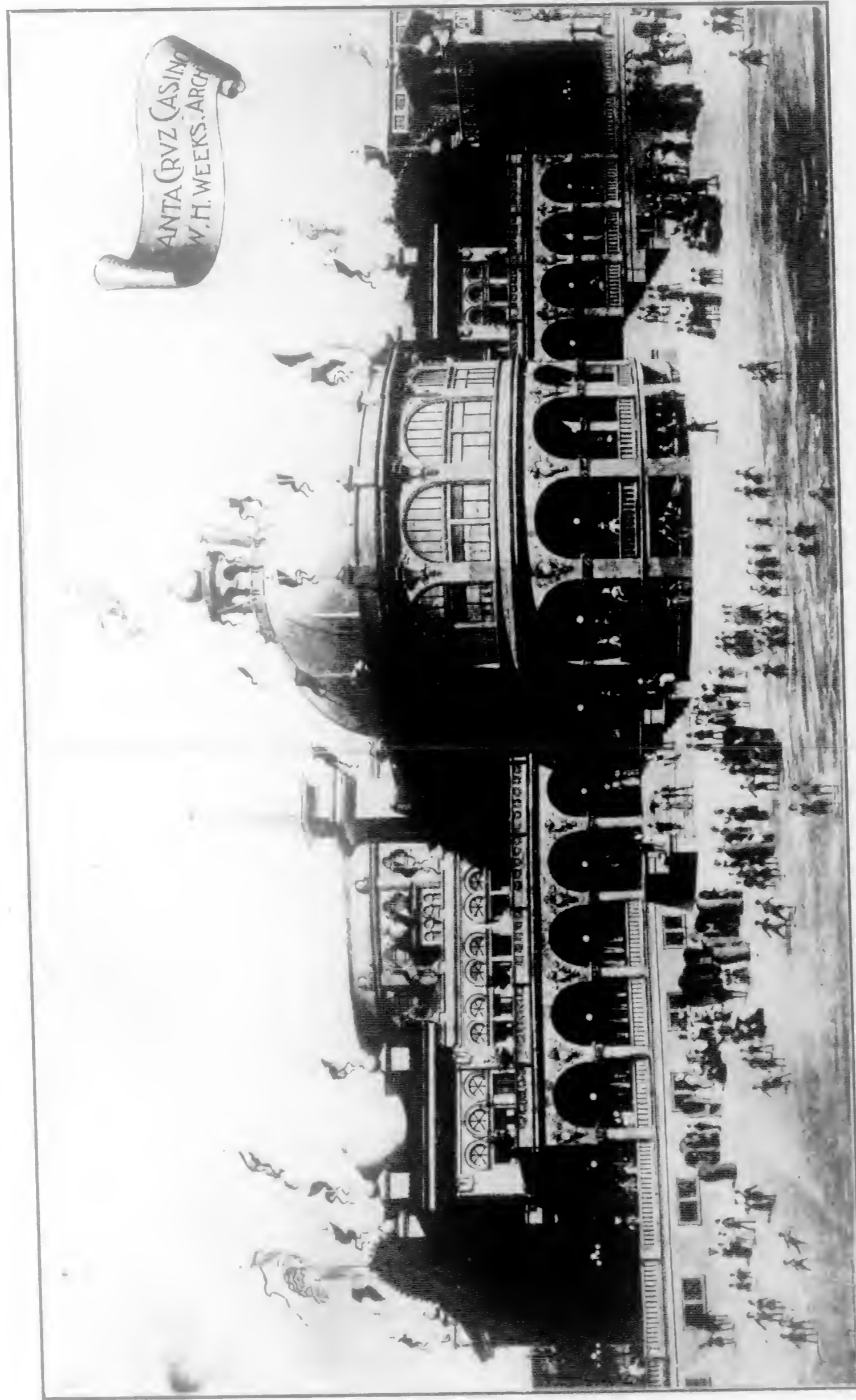
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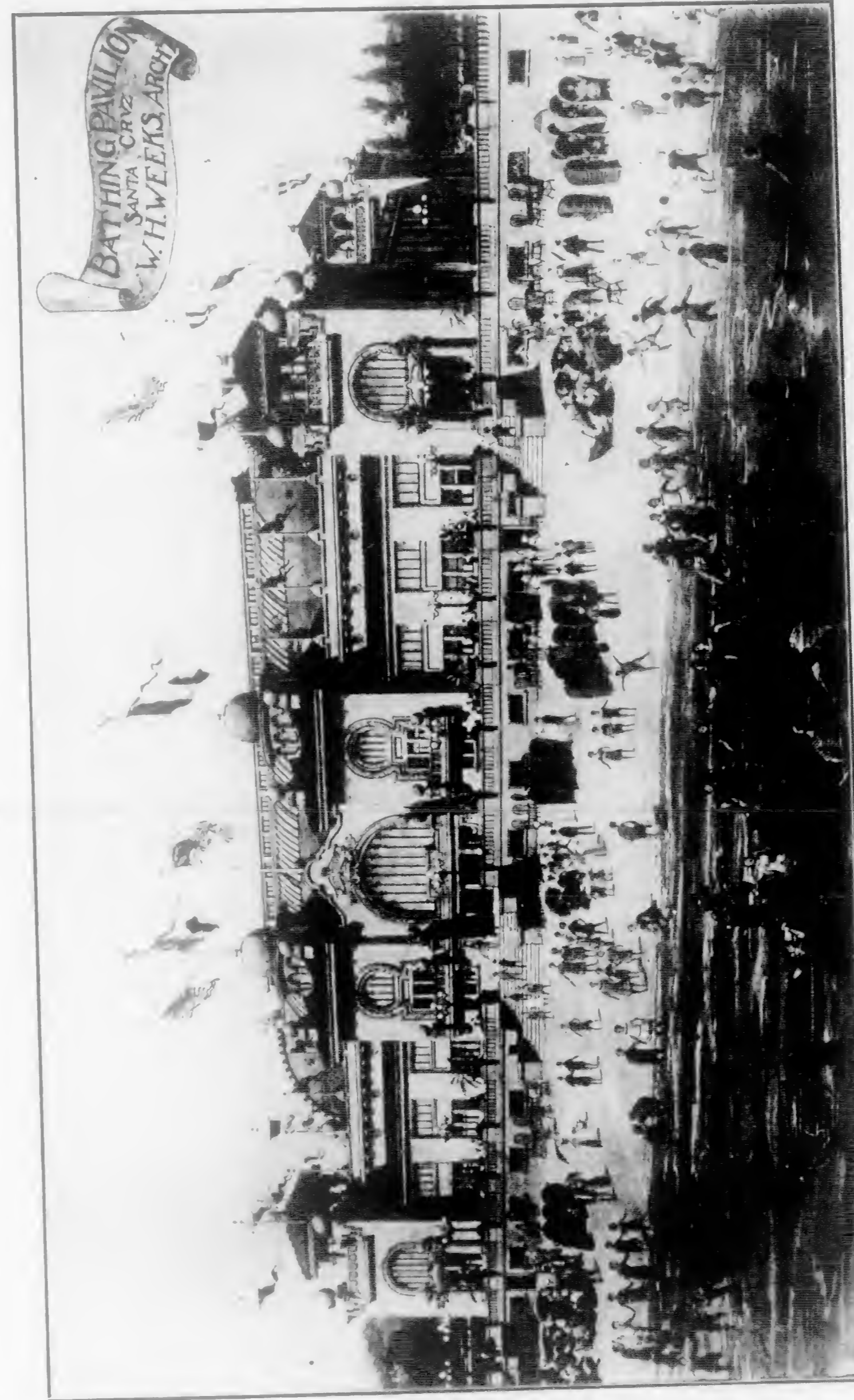
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The Bathing Pavilion, Santa Cruz, Cal.
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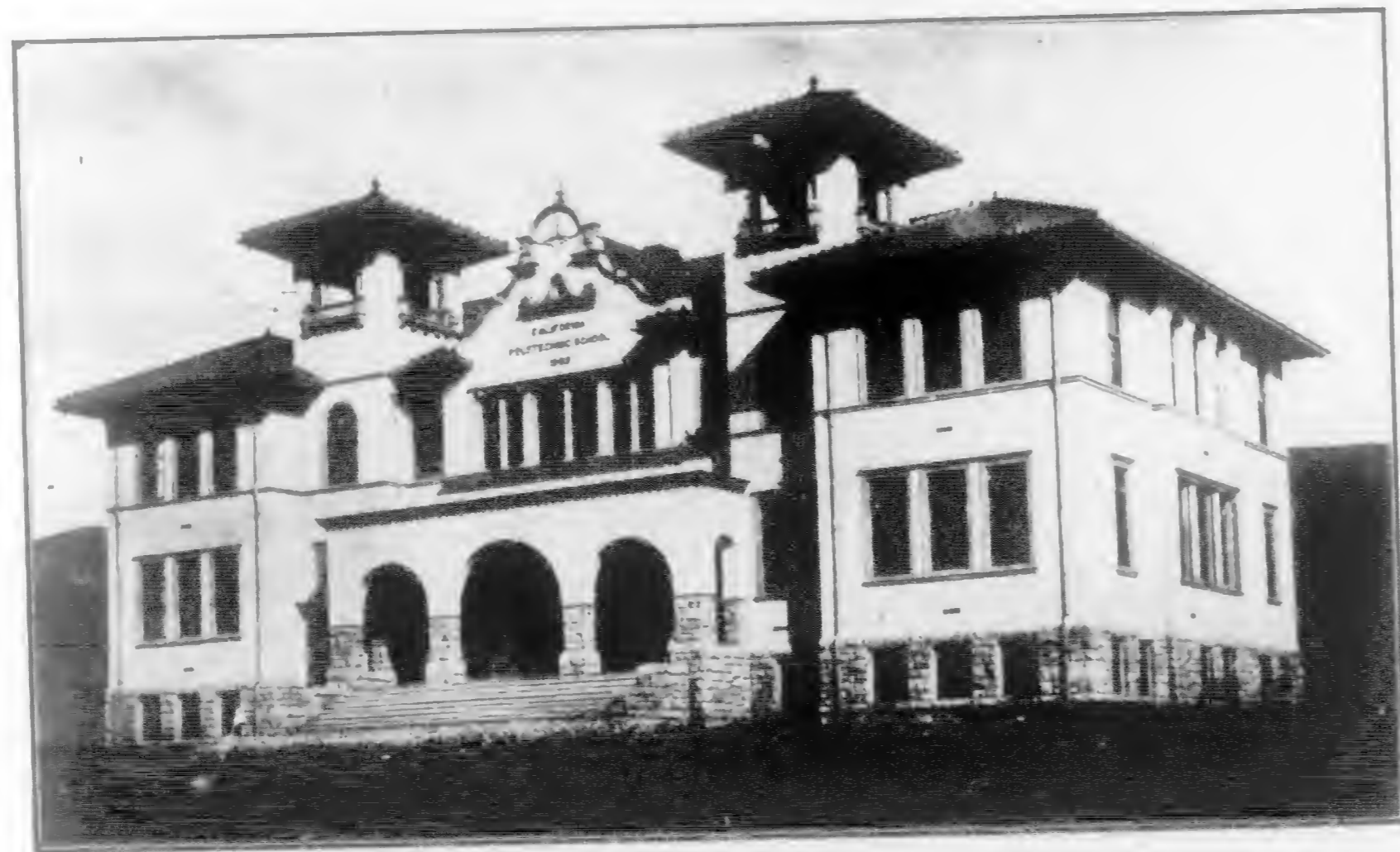
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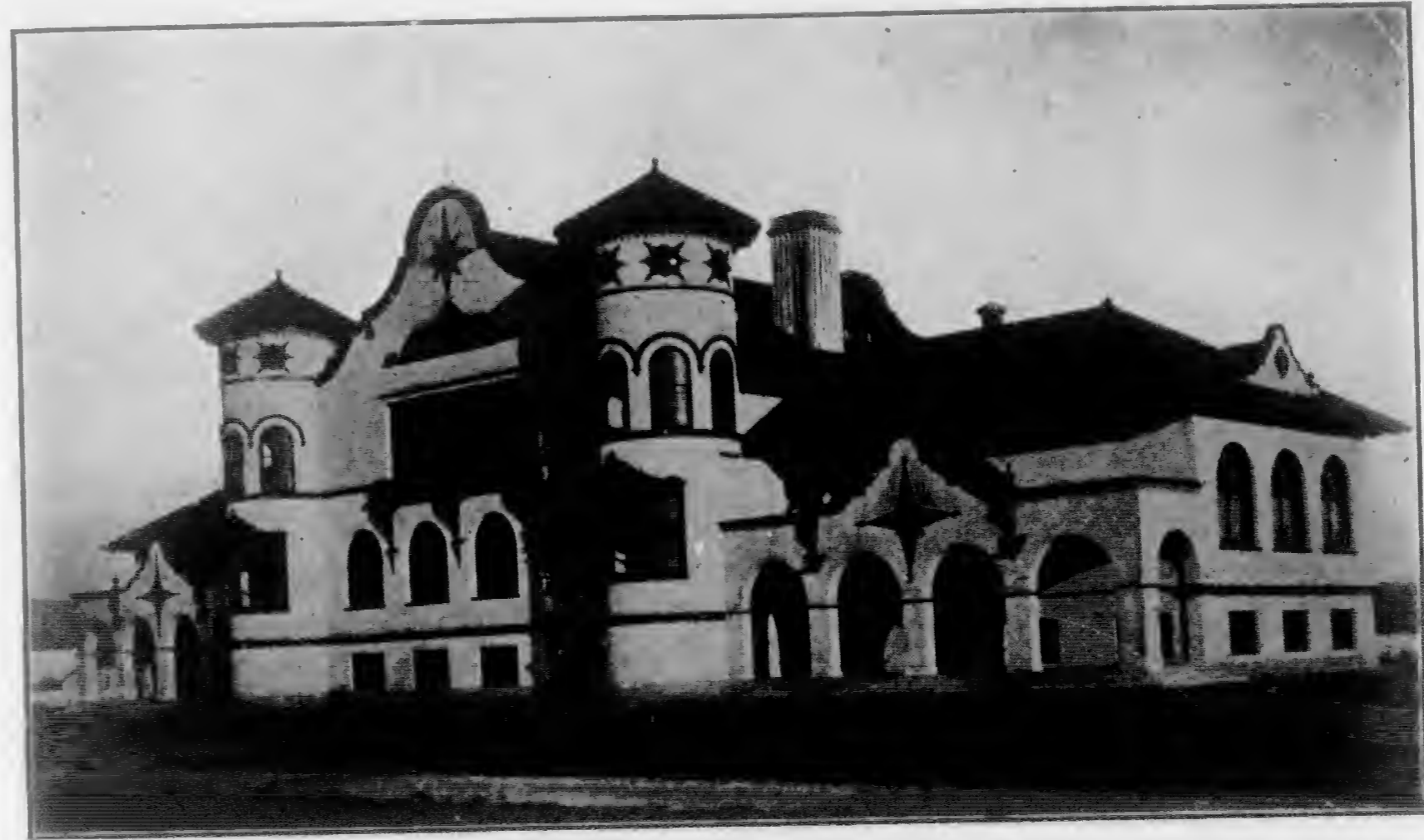
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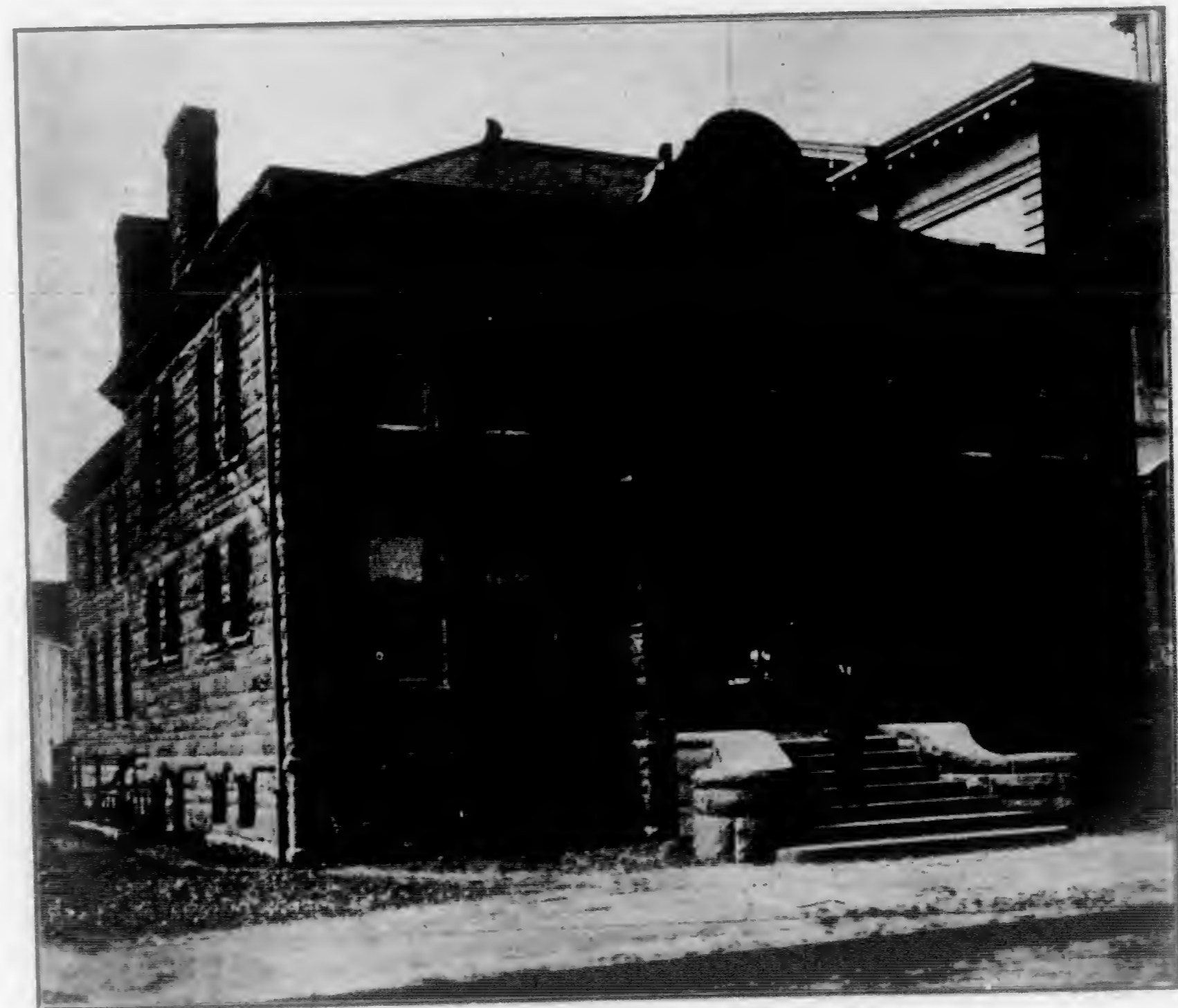
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*First National Bank, Salinas.
W. H. Weeks, Architect*

rience gained by working under some of the leading architects of the East, combined with an early mastery of the many details of safe construction, has made him one of the most practical men in his profession.

Mr. Weeks first began the practise of his profession at Wichita, Kansas, where many of the finest buildings in that city bear testimony to his marked skill and ability.

His first important work in Wichita (when only 19 years of age) was his employment by the Board of Trustees of the Garfield University to take complete charge of the construction of the university building at Wichita, said to be the largest single college building in the United States.

Upon coming to California Mr. Weeks secured a great deal of work from the Spreckels Sugar Company, then located in Watsonville. This necessitated opening an office at that place, which he still makes his headquarters, finding it a convenient center for his work through the central coast counties. In 1905 Mr. Weeks opened an office in the James Flood building, San Francisco, and after the fire he moved to temporary quarters at No. 6 East street, San Francisco.

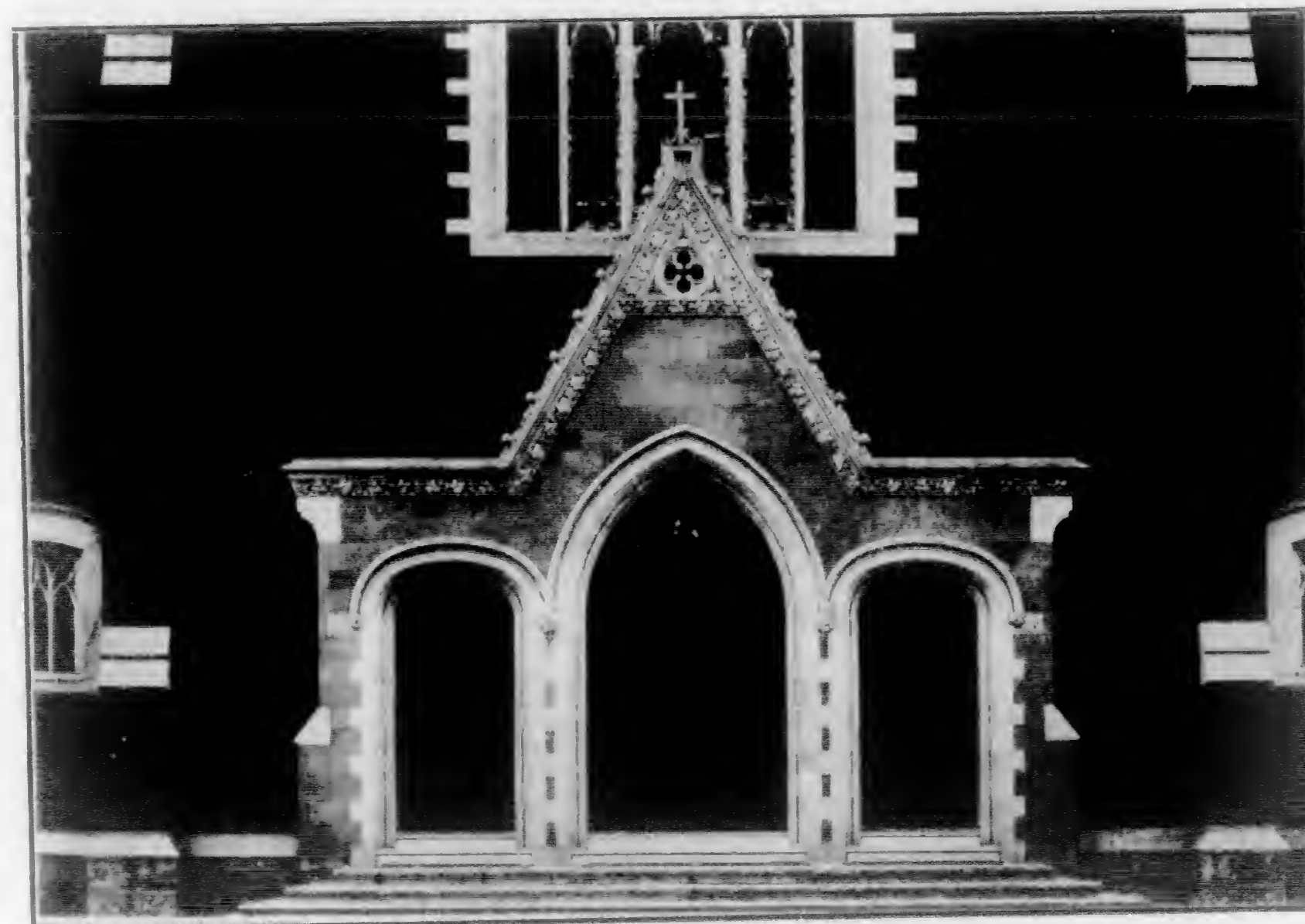
Outside of the building Mr. Weeks has done in San Francisco and vicinity practically all of the best buildings erected within the last four years, from San Jose to Santa Barbara, have been from his designs, while at the present time he has work under way in nine counties of this State.

One of the best of Mr. Weeks' recent buildings is the Paso Robles bath house, classed by Dr. Simon Baruch of New York, the greatest living authority on water treatment, to be the best equipped in the world.

It is not the exterior of this building that is of the most interest—the interior, with its beauty and finish, calls forth the greatest praise.



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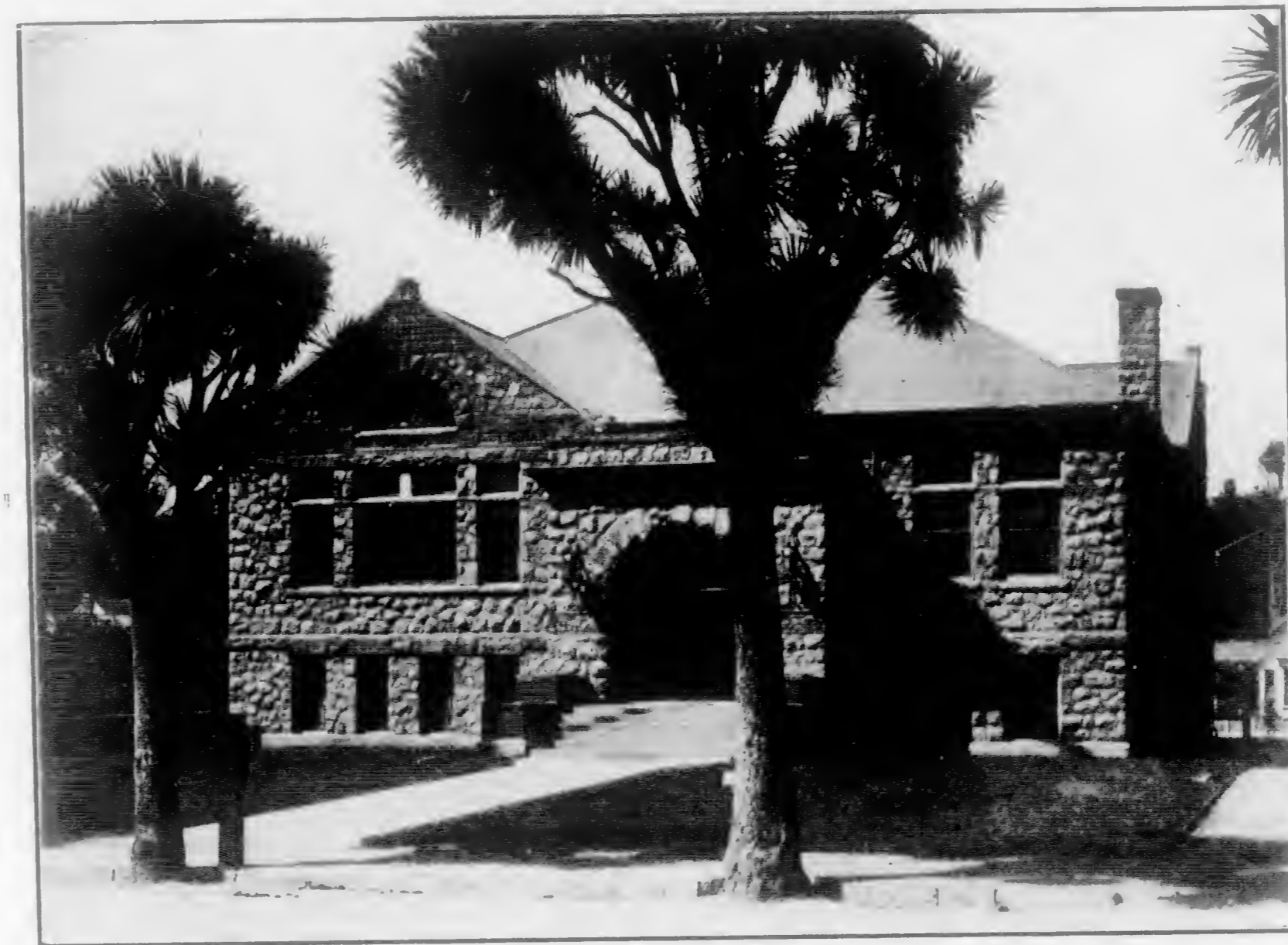
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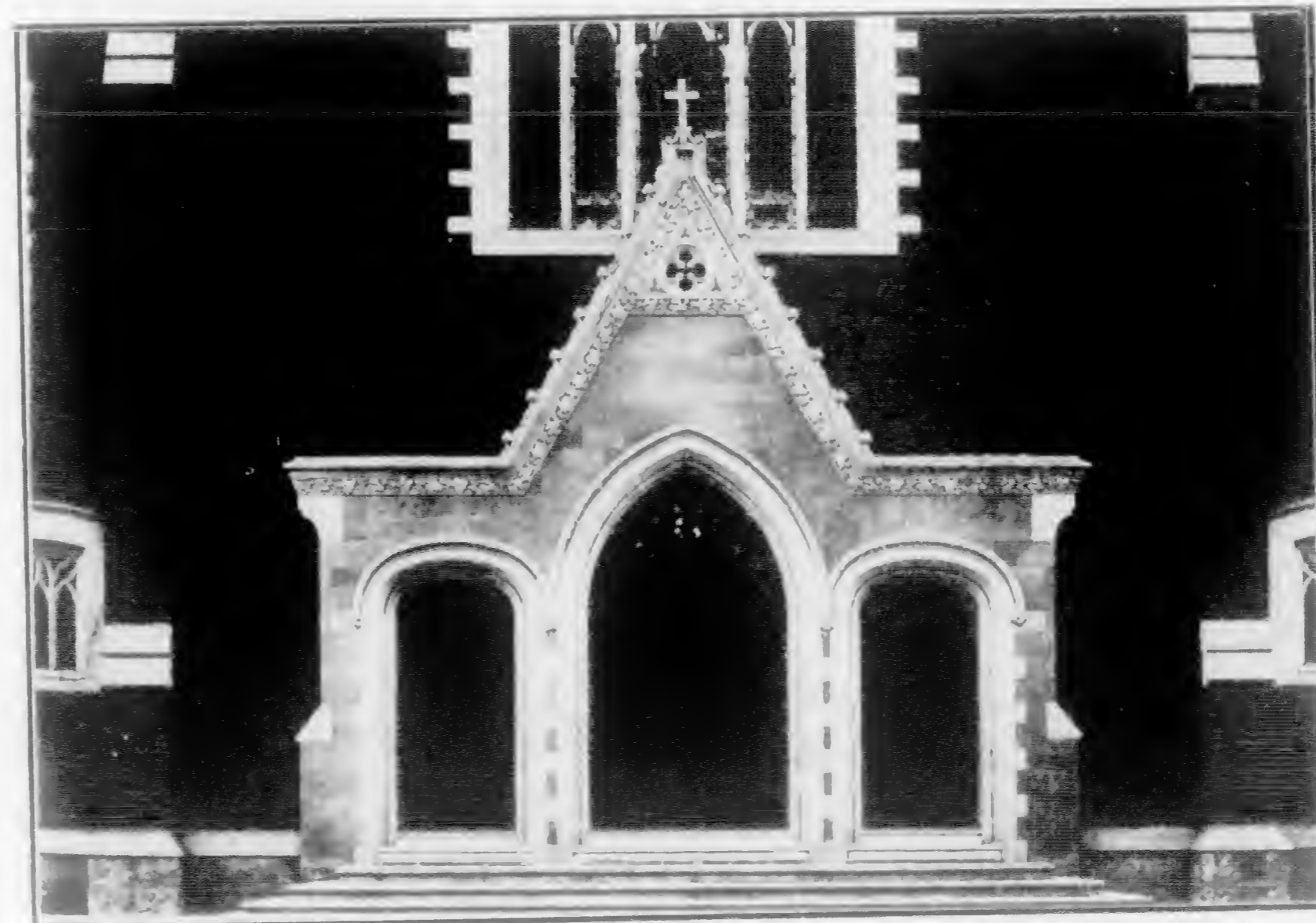
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Planned as it is for a pleasure resort where the motto is "Never a dull moment," the Casino was no light problem in the matter of arrangement so as to provide for the many diversified features.



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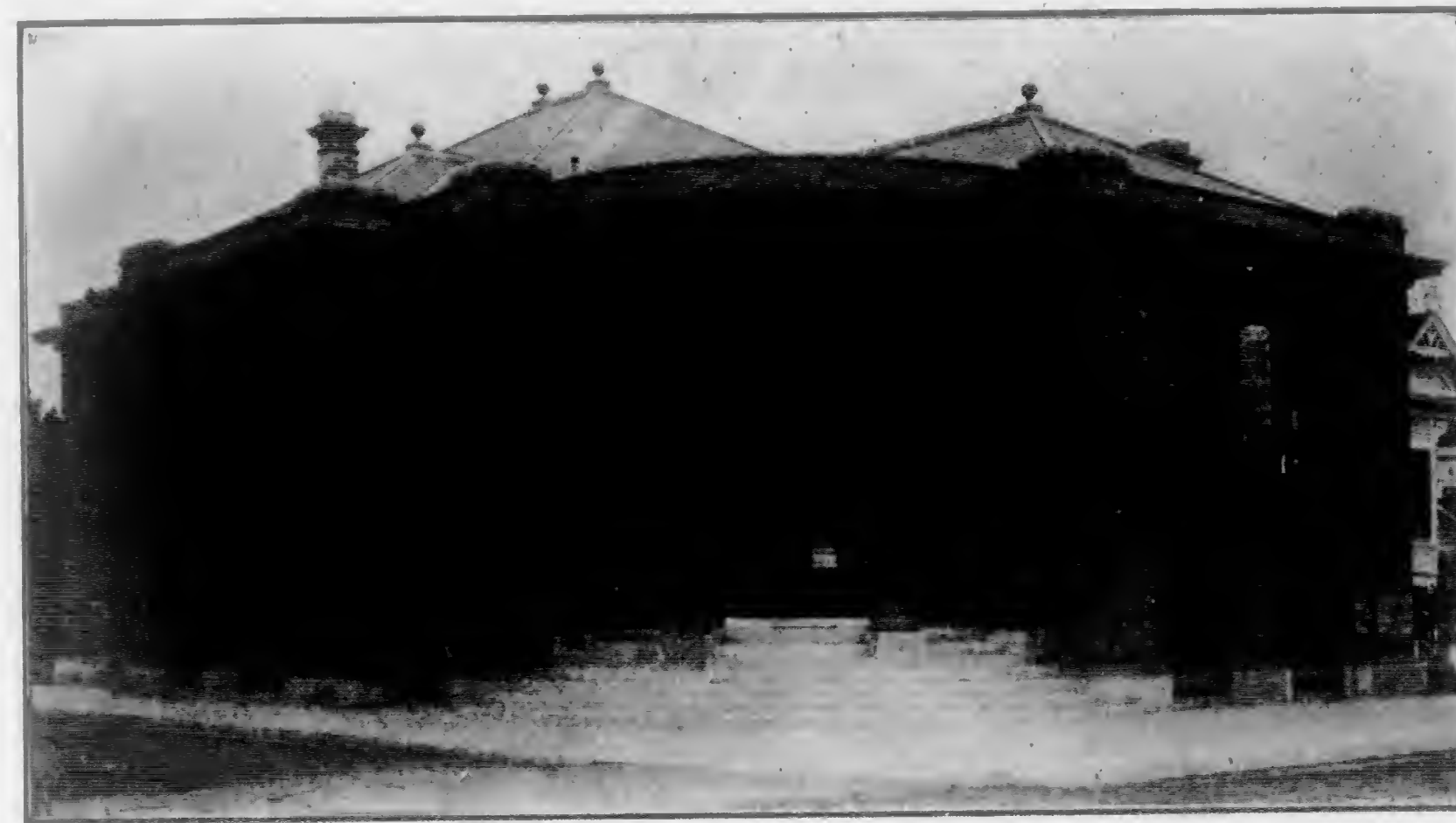
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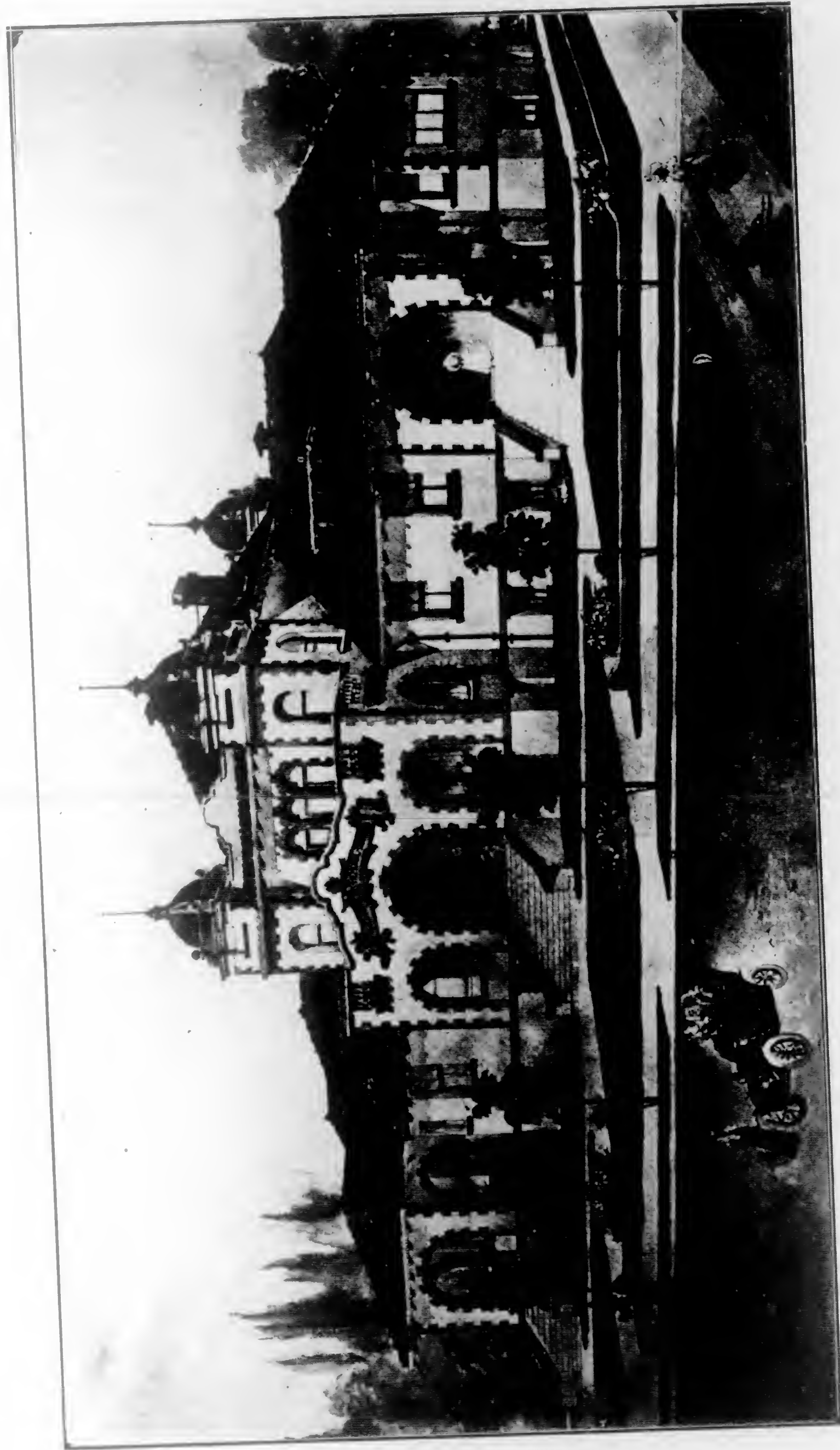
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*Lobby, the Vendome Hotel, San Jose, Cal.
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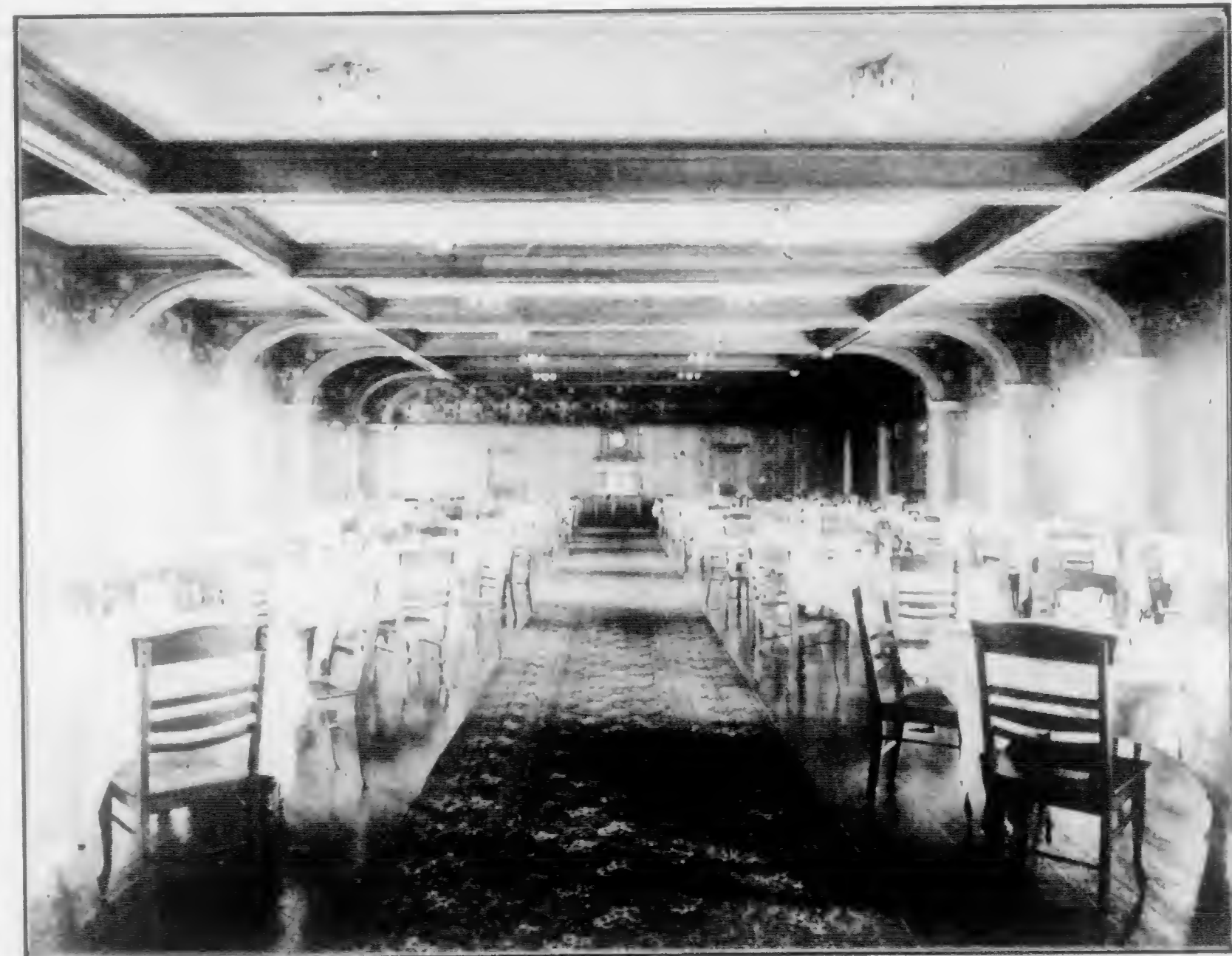
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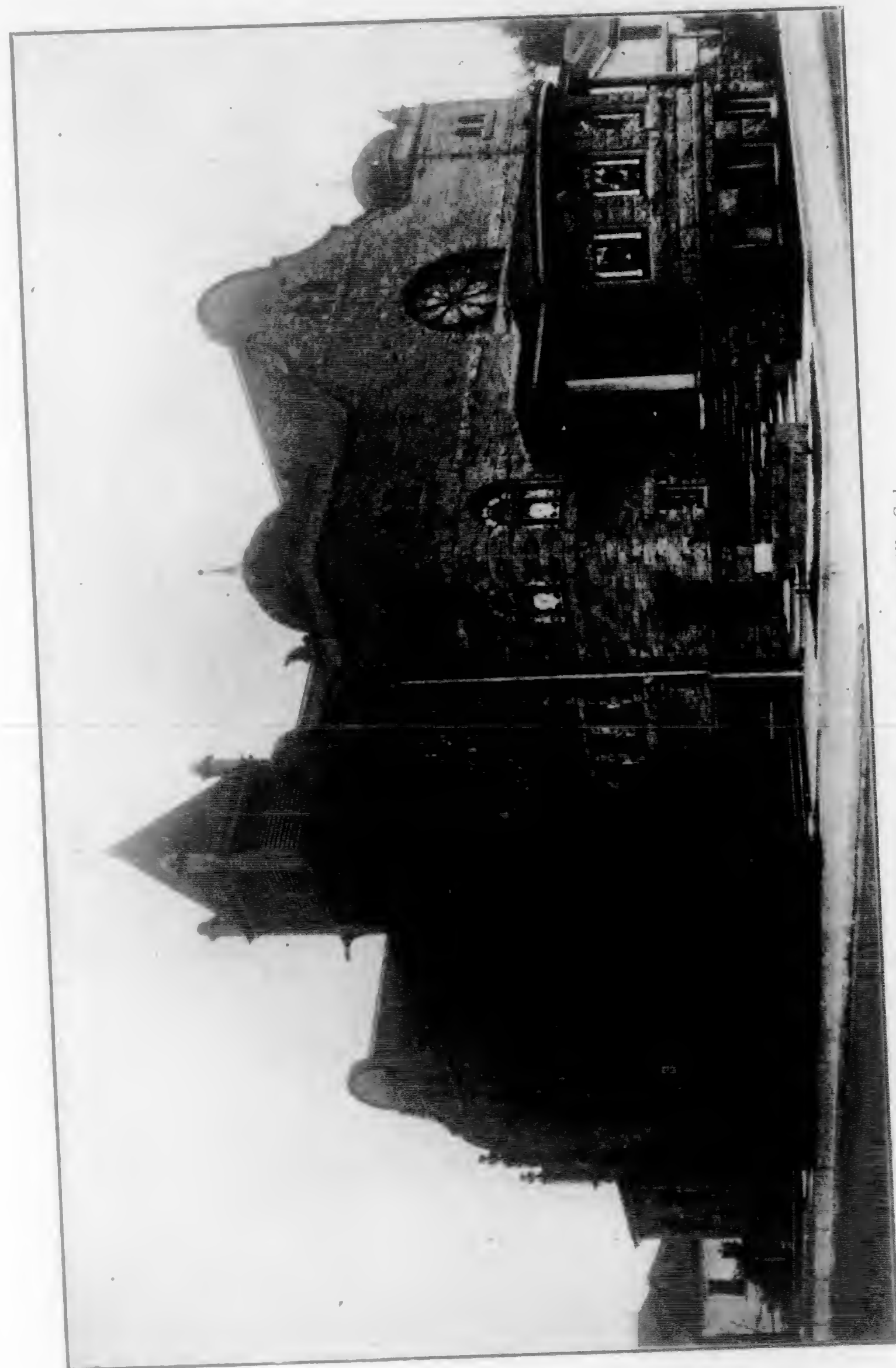
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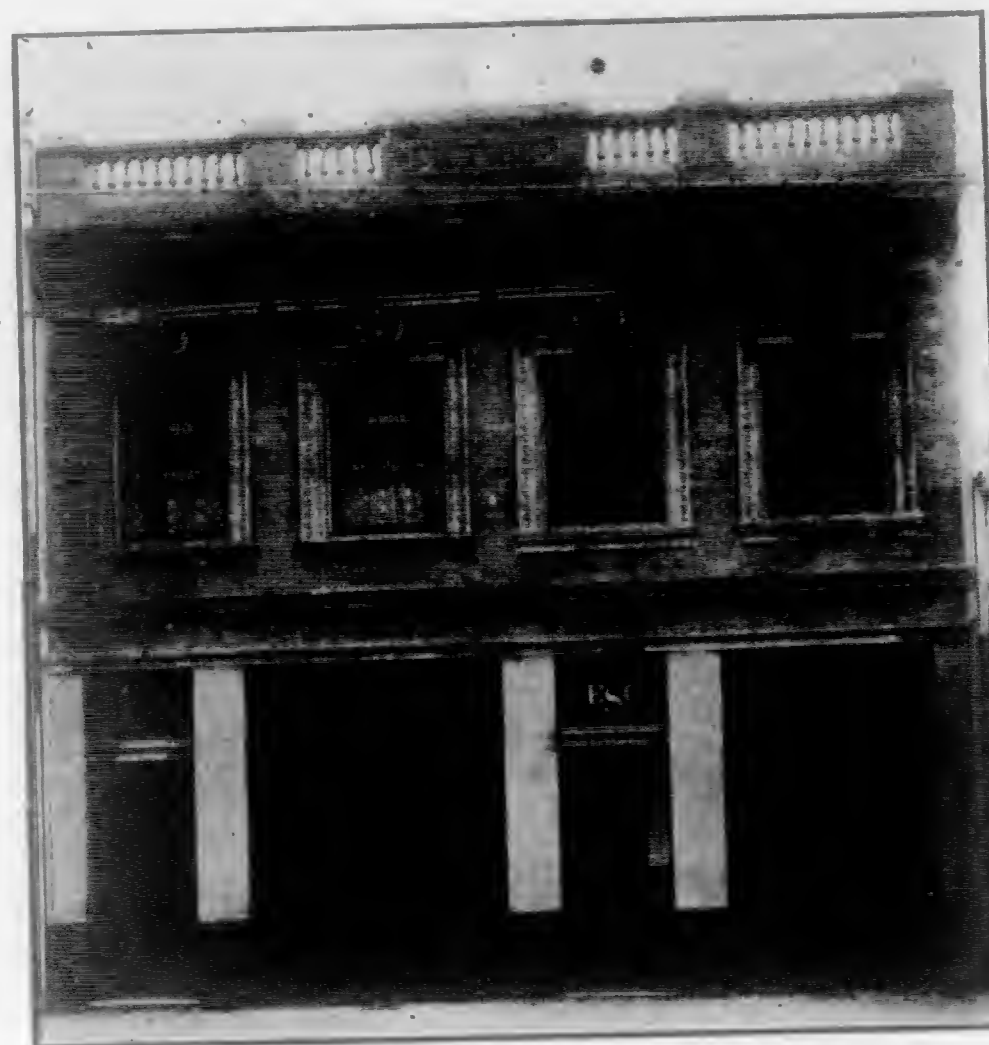
*Lobby, the Vendome Hotel, San Jose, Cal.
W. H. Weeks, Architect*



Dining Room, the Hotel Vendome, San Jose



*First Christian Church, Watsonville, Cal.
W. H. Weeks, Architect*



*Bank of E. C. Smith, Pacific Grove, Cal.
W. H. Weeks, Architect*

The principal feature of the first floor of this building is the large concession room, an emporium in itself, 140 by 100 feet, around which is grouped the many concessions. The center of this room has a beautifully designed ice cream inclosure. From this room the main stairways lead to the ball and grill rooms.

The bar room 40 by 64 feet finished with tile floor and enameled wood work, is decorated in keeping with the room. The ladies' parlor, opening off the concession room, is beautifully finished in California Aspen. The walls and ceilings are tastefully decorated.

The main amusement room on the second floor can be used as a theater, ball room or convention hall. The stage is 45 feet in depth and the Proscenium Arch is 30 by 20 feet. This room, with galleries, will accommodate 1500 people. Opening into the main amusement room is a magnificent grill room 65 by 70 feet overlooking the bay. The windows of this room are all of plate glass 11 feet wide. The beamed and decorated ceiling is supported by ornate columns in keeping with the beautiful panelling of the walls. At the end is an elevated orchestra loft.



*Design for the Goldstein Building, Monterey, Cal.
W. H. Weeks, Architect*



The T. A. Work Building, Pacific Grove, Cal., built of concrete blocks
W. H. Weeks, Architect

Maple floors are used in all the principal rooms. The kitchen, 40 by 60 feet, is worthy of mention for its completeness. It is divided and fitted up equal to the best hotel kitchens in the state with bake shop, cold-storage plant, etc. Other attractions are the three roof gardens, the largest being on top of the main building. The Natatorium is one of the finest in the world and the second largest on the coast.

The main swimming pool is 80 by 140 feet and of solid cement. The women's and children's pool is 35 by 60 feet. The walls of the pool are lined with enameled terra-cotta and white tile. The immense steel arches over the pools give a beautiful effect. Connected with these pools are 600 dressing rooms. The decorations of the exterior of the buildings are in keeping with their surroundings. Sea life in its varied forms are here represented.

The beautiful Vendome Hotel in San Jose has recently been rebuilt from plans by Mr. Weeks, who is also the architect of the palatial Dougherty mansion now under construction in the Garden City.

* * *

Imports of Portland Cement

The importation of cement in February, 1907, was 100,000,000 pounds, or over 250,000 barrels more than in February, 1906, the total importation for the month being 323,000 barrels of 380 pounds. In the eight months ending with February the imports were nearly four times as much as during the same period a year ago, being 2,282,000 barrels. If importations continue at the same rate until July 1st, the highest record of the past will be equaled if not exceeded.

Exports of domestic cement during February were 60,848 barrels, nearly 2½ times as much as in February last year, but for the eight months the exports, 432,527 barrels, were only 70 per cent of those for the same period last year. The re-exports of foreign cement do not differ greatly from last year, being a little less for the month, 560 barrels and a little more for the eight months period, 12,000 barrels. There are in custom-house storage 52,000 barrels ready for the spring trade.



House of Mrs. E. A. Preble, New Monterey.
W. H. Weeks, Architect

Building the Home

By WILLIAM H. WEEKS, Architect

SINCE the time when man first inhabited this terrestrial globe the building of a home has been one of the most important events of a lifetime. Home is the anchor to many a weary heart and has held man to the best that earth possesses; "Home sweet home" the poet sings and we all can add our voices in sweet accord to sound the praises of earth's dearest habitation.

There is more in this life than mere existence, and as we hurry along life's highway we should pause long enough to enjoy the beautiful things that spring up by the wayside; and what can be more attractive and beautiful than a happy comfortable home?

The home being such an important factor in this existence of ours and the building of that home such an important event in life it seems fitting that a man should devote his best thoughts and energies to the planning of it, which when built will stand as a monument to his taste and judgment.

Happy is the man who looks at life through the right window and witnesses the necessity of providing the proper environment for those dearest to him. Then let the home be artistic and comfortable and finished in keeping with the means at your disposal. Provide a home for your family that will be in keeping with the best attributes of your nature, a home that will not only be a credit and a pleasure to you but also to those depending upon you.

Do not proceed blindly and consider the planning of your dwelling safe in incompetent hands, and after it is too late lament the fact that you did not proceed with more deliberation and get the best possible value for your money in an attractive and comfortable home.



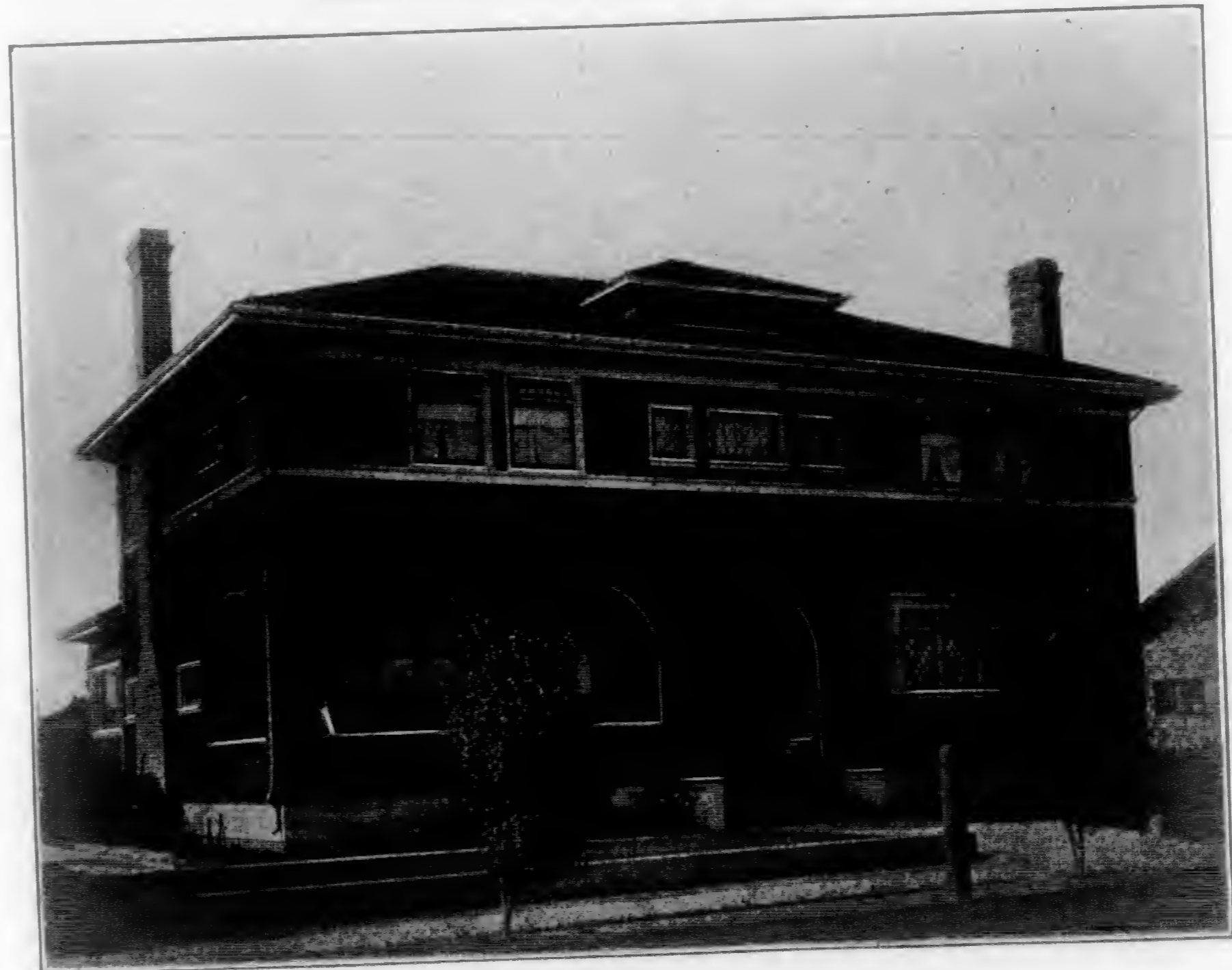
Interior House of Mrs. E. A. Preble, New Monterey, Cal.
W. H. Weeks, Architect



Interior House of Mrs. E. A. Preble, New Monterey, Cal.
W. H. Weeks, Architect



Wash Drawing of House for Mrs. W. P. Dougherty, San Jose, Cal.
W. H. Weeks, Architect
Millwork by Santa Clara Valley Mill and Lumber Co.



Residence of C. H. Langley, Watsonville, Cal.
W. H. Weeks, Architect



Interior House of Mrs. E. A. Preble, New Monterey, Cal.
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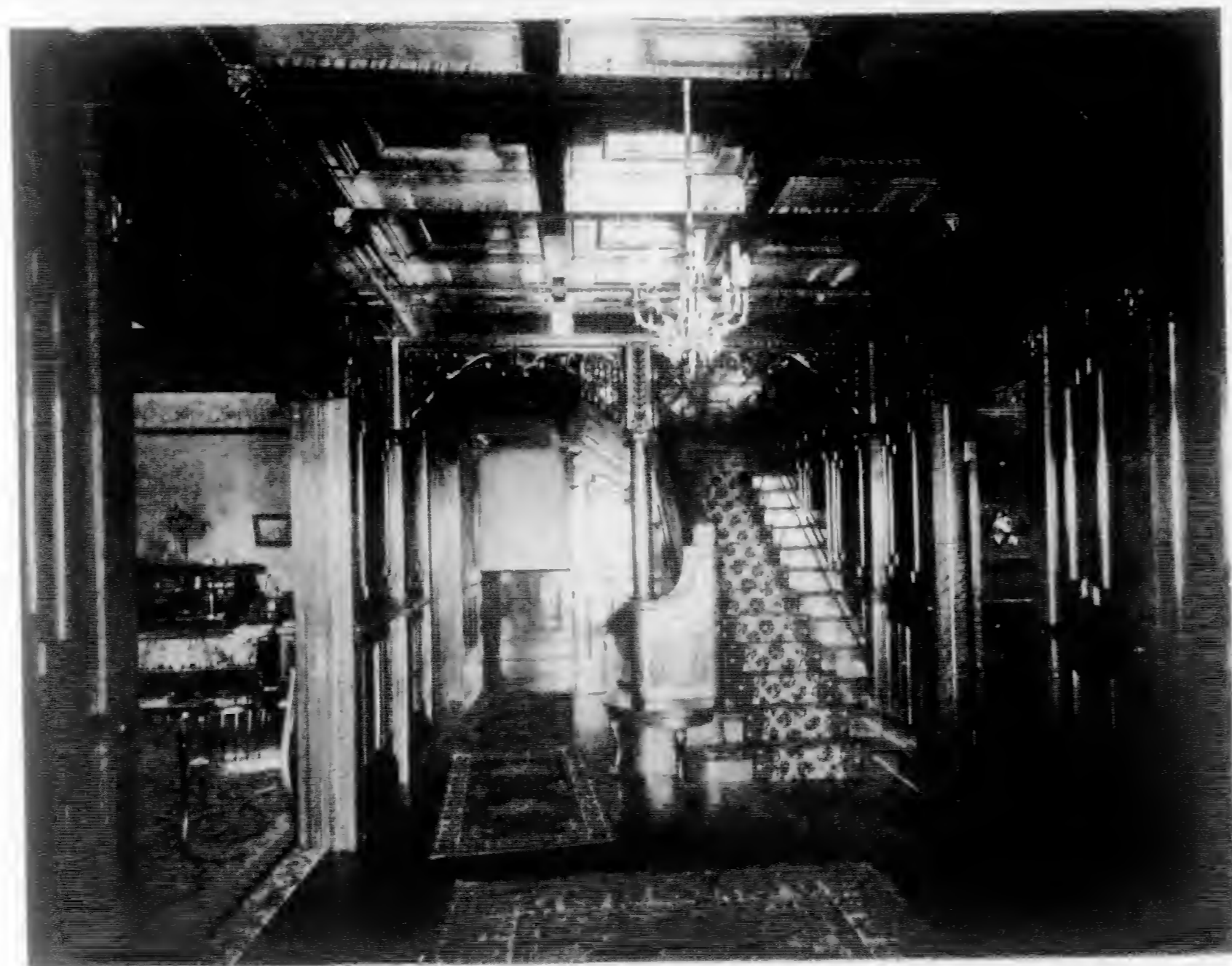
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Residence of H. A. V. Torchiana Watsonville Cal.



Interior of Residence of W. C. Waters, Spreckles, Cal.



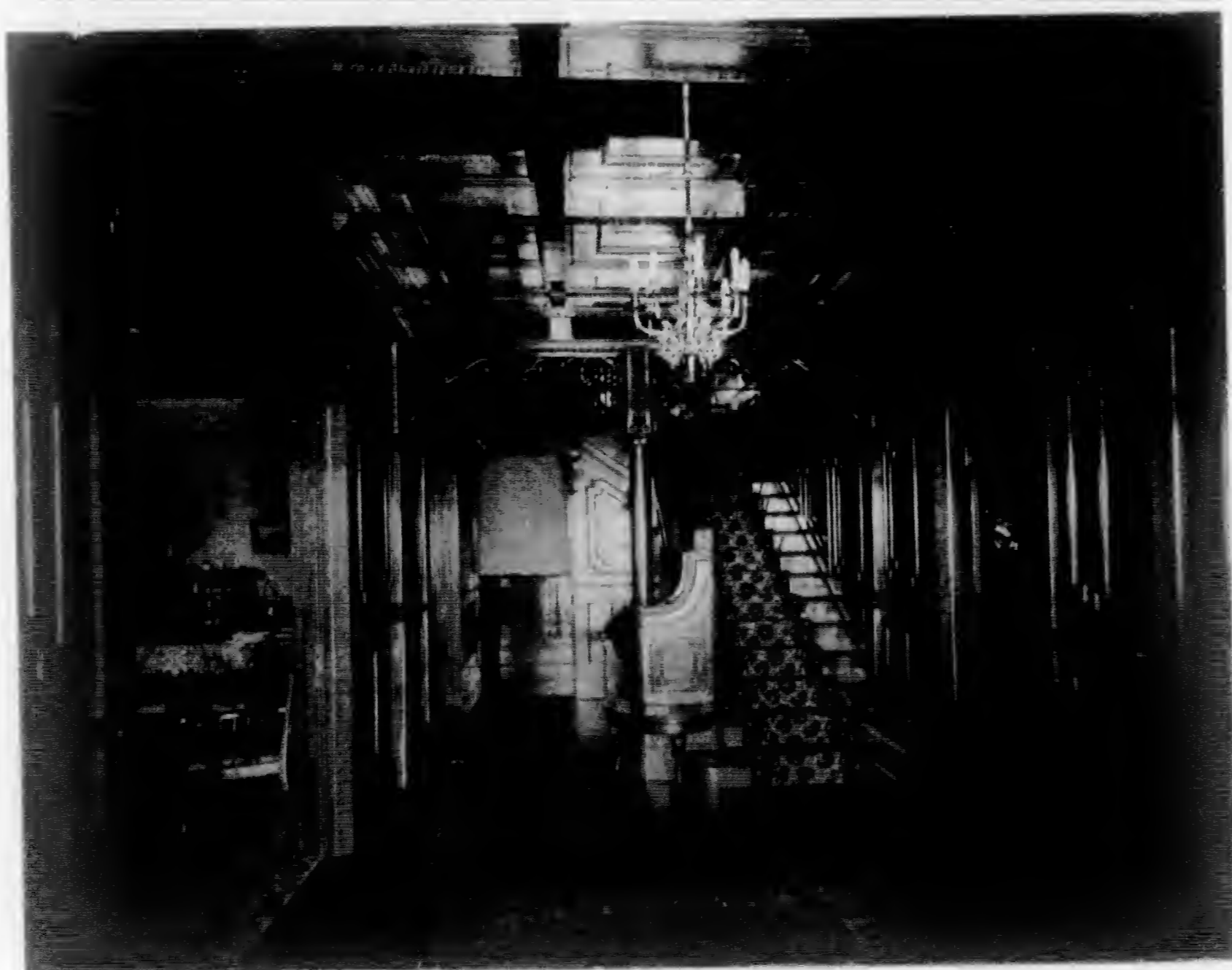
Residence of M. B. Tuttle, Watsonville, Cal.
W. H. Weeks, Architect



Entrance of Tuttle Residence, Watsonville, Cal.



Residence of H. A. V. Torchiana Watsonville Cal.



Interior of Residence of W. C. Waters. Spreckeles, Cal.



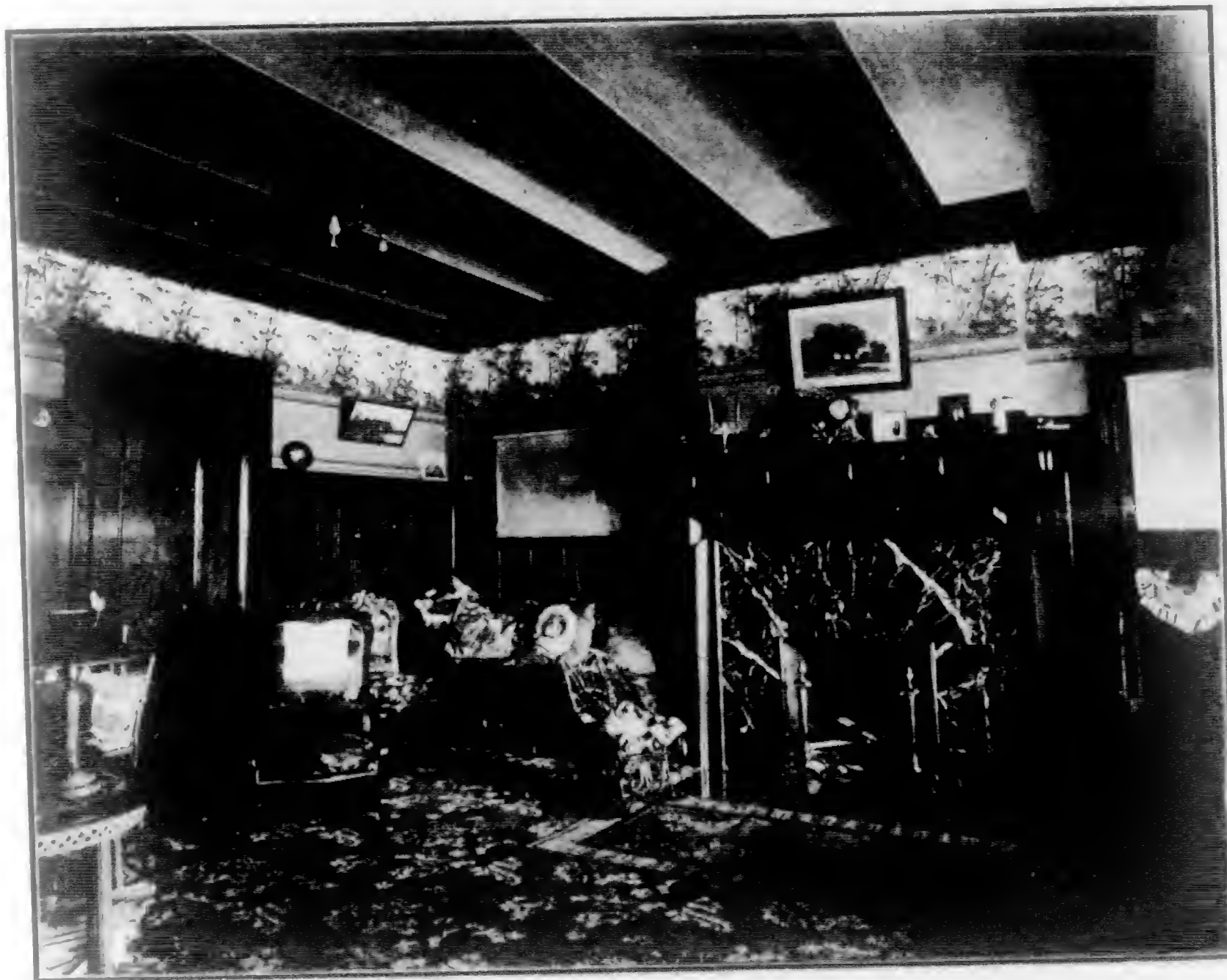
Residence of M. B. Tuttle. Watsonville. Cal.
W. H. Weeks, Architect



Entrance of Tuttle Residence. Watsonville Cal.



Residence of Geo. Gertz, Watsonville, Cal.



*Interior House of Mrs. E. Cornell, Watsonville, Cal.
W. H. Weeks, Architect*

Every year opinion is demanding more and more that a home shall be more than a mere house in which to live and that it must be in keeping with modern ideas and tastes and a distinct gain architecturally to the community. This is as it should be; for the ambition to own an attractive home carries with it a greater love for all the institutions that make better homes and elevate character.

This growing taste for the beautiful in buildings makes a constantly increasing demand for good architectural designs. The day when the carpenter was both architect and builder is past; for it has been demonstrated that an owner can employ a competent architect, get a better house in every way for far less money, including the architectural fee, than he could get in the old way; sensible men are becoming aware of this fact and in consequence they will not build without the services of a competent and trustworthy architect. This is proper and right, for the architect has devoted his time and money to the study of the artistic, the harmonious and the convenient in buildings that he may give to his buildings that magic touch that makes of the cottage or palace a thing of beauty. All this requires special study as well as artistic taste which the builder seldom possesses.

Look around you and notice the many houses that are spoiled (and they are many) simply for the lack of a skilful hand in the planning; by a slight change that would not have advanced the cost of the work, the house could have been made so much more convenient and artistic. What a pleasure it is and what a pleasant impression we get as we enter a well-planned building, with its cozy nooks, its open fires, its broad and easy stairways and its well-lighted and sunny rooms, everything in harmony and all designed with an eye for comfort and beauty. We might mention more minutely the many architectural aberrations that greet us at every turn, but we do not care to harp on the mistakes of others; but would rather point out the proper way to the prospective home-builder that he may profit thereby and avoid the costly experience of his neighbor.

Then in conclusion: The proper way to build, after your lot has been secured, is to engage the services of an architect in whose ability and honesty you have perfect confidence; beware of the builder who tells you that you can dispense with the services of an architect and that having plans drawn is an unnecessary expense. He knows this to be false, and he is simply misleading you in order to get a larger profit on your work. You can just as soon dispense with a lawyer in a lawsuit or a physician in a case of serious illness as to dispense with the advice and aid which a competent architect can give in the building of your home. With his knowledge of materials and mechanics he can save you far more than his charges in actual cash, without considering the superior building that you will receive.

* * *

Let it in

When you're feelin' grouchy,
Let the sunshine in;
When your face gets feelin' hard,
Crack it with a grin.

Don't be 'traid o' wrinkles,
Tear loose with your mirth;
An old face, laughter wrinkled,
Is the sweetest thing on earth.



Residence of Geo. Geitz, Watsonville, Cal.



*Interior House of Mrs. F. Cornell, Watsonville, Cal.
W. H. Weeks, Architect*

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The Confessions of an Architectural Reformer

By F. W. FITZPATRICK, Architect

MY NATIVE modesty prompts me once in a while to ask myself the question, Do I not harp overmuch on the subject of good building, proper construction, and do not the readers of *The Architect and Engineer*, *Fireproof Magazine* and other journals grow a bit tired of such continued preachments by a probably rather tiresome preacher? Then I come back at myself with the question. Is it possible to say too much on such a question, even if you don't say it well? It puts a fellow between the two horns of a dilemma, as it were, because, spite of the aforesaid modesty, I daily see evidences of the good that even this John-the-Baptist-like-preaching-in-a-sort-of-desert has done, and on the other hand kind friends or at least critics often suggest, and not by indirection, that I say too much, approaching if not indeed passing within the limits of garrulity. A letter received this morning from the editor of an important technical journal has brought all these conflicting thoughts to mind again. He is polite enough to not say that I talk too much, but intimates that I lay too much stress upon safe construction, that in dealing with this fire matter I should remember that cities should be encouraged to increase water supplies, to improve fire departments and get people into the use of sprinklers, etc., etc.; that much harm can be done by exaggerating the power of a single factor; that I ought to use my channels of publicity to meet the fire problem on a broader basis, and should labor rather for the co-operation or co-ordination of the various curative agencies rather than to lay such emphasis on merely the one point of proper building. He excuses me, however, on the ground that being a specialist on construction I naturally imagine, as do all specialists, that my particular branch is the all-important thing!

The gentleman, as I say, edits an important technical journal that is doing considerable good in the field of fire-extinguishing, but I hardly think that his argument is of excessive weight. Cities and countries have labored along the lines he suggests from time immemorial, fighting plagues, diseases, fire and all those things with curative agencies after the trouble has set in. Under the new dispensation they have become more intelligent, and are trying to prevent the spread of those ills; indeed their very occurrence, even in most incipient form. And I respectfully submit to his attention and to that of all other critics that "an ounce of prevention is worth many pounds of cure," and that there is no better known or more simple prevention of fire than the elimination of fuel to burn.

Does it take a vast deal of imagination for editors and all others to realize that the more buildings you have of good construction, incombustible and undamageable by fire, the less need will there be of water, firemen, and the other so-called "co-ordinate" branches for the fighting of fires when it does occur, branches that, granted, have become most necessary by our follies in the past, but that sensible men should strive to eliminate rather than to everlastingly keep on increasing?

No; for the nonce at least I will not change my ways, but rather will clamor still more loudly from the house-tops, if need be, and emphasize with every means in my power the overwhelming importance of proper and fire-resisting construction, even though some people may relegate me to the ranks of mere specialism.

Without pleading guilty to the fault myself it is, nevertheless, rather amusing to see how prone people are to exaggerate the importance of

their own branch. A rather ludicrous example of this was given a short time ago in a paper describing the Chinese army, written for one of the magazines by a young officer who is attached to the quartermaster's or whatever department it is, having much to do with the clothing of our army. He interestingly describes the Chinese troops, and then sums up the whole subject in three or four salient criticisms that constitute the reasons he has for believing that the Chinese army is not fit to meet that of any of our so-called civilized nations. These weighty reasons are followed by as many suggested cures and one of these, in fact, I believe the second one in importance, is an impassioned appeal to the Chinese authorities to take up the slack in the seat of the Chinese breeches!

* * *

We read a good deal in the architectural journals about the various points in the ethics of the profession. Competitions and their management, decision, etc., offer a cardinal topic for these discussions. I just ran up against a little detail of "ethics" that, of course, in the main, concerns me alone, or certainly not more than the three or four of us in general consultation practice, though it may be of interest to the profession at large as an illustration of how at least some competitions are handled. A while ago a semi-public building was decided upon for a certain city, and a competition announced. There were all the usual frills about it of the most sacredly straight affairs, the plans were limited, no color, no perspective, the names concealed and every precaution taken, seemingly, to make it an ideal competition. One of the local architects came up to see me—a very nice fellow, standing well in the community—and we made arrangements to go into it together. He not merely retained me to advise him or design the building, but we went into a full-fledged special partnership. The relations are, therefore, naturally closer than those of merely client and advisor, or to put it legally, I am not only his attorney, but a party in interest. Well, sometime after, another architect from a city some distance away from the first came to see me, and wanted a design of a building made, so many stories high, as fine a water-color as was possible to make, and so on, and so on. He grew enthusiastic and confidential, and told me that it was for a competition that was all tied up with the strictest kind of frills, concealed names, etc., no pictures or anything of that nature, but he was "on the inside," and had an appointment for a secret meeting with the committee the day before the competition came off and was to show them this picture, other drawings that the other architects could not possibly have, and all that sort of thing. It was all fixed for him, and the only thing that remained for him to do was to convince two of the committee by the superiority and number of his drawings that he was the right man and that the rest of the committee were justified in wanting to award him the job. I excused myself from joining in anything of that kind, telling him that it was shady practice that I didn't care to countenance, and strongly advised him to keep out of, too. But he pressed the point and proceeded to give me proofs that he had the inside track, and wanted to produce this picture because the committee had asked him to, and finally wound up by telling me that it was this very building in the other city that I was then at work upon! Now, then, the ethical question is, "Where am I at?" Keeping the attorney simile in mind, here is where I am counsel and partner to a defendant, let us say. Crooked, though in good faith, the plaintiff unconsciously comes to me with his case, and before I know that it is the same case

he gives me valuable information, proofs of where and how he proposes to defraud my client and partner. As a lawyer I can not only not take the case, but ethically can not use the information so imparted to me in the sacredness of the confessional, as it were. That would be at law, but I would give fifteen cents to know what architects generally would advise. To get right down to brass tacks, however, while I would not denounce the man, I think it is up to me as a reasonable business man with his own and his associates' interests at heart to take such steps, without any publicity or fuss, to estop the aforesaid committee from doing anything illegitimate and under-handed with this particular or any other crooked practitioner.

And that is just one little illustration of the meanderings and twists and turns of the competitions matter, the process adopted in awarding millions of dollars' worth of work and that involves thousands of architects into thousands of dollars and months of time uselessly expended.

* * *

Some "alarmist" has seemingly stirred up our French cousins a bit on this question of reinforced concrete. It did appear awhile ago as if the French, with their art nouveau and other crazes had absolutely and completely absorbed the reinforced concrete one. The discussions being carried on in their technical journals are very interesting, indeed. A Mr. Boileal seems to be the highest authority in favor of concrete there, but he certainly bases his contentions on exceedingly slim foundations. One would think that with as much concrete work as they have done there, these French concrete experts would rely upon their own tests and findings, and not having to go galumphing off to foreign countries for the reinforcement of their theories. They must realize that when reports and proofs come from such long distances they are liable to lose a little strength, a certain tare, on the way. To us here, who know and who have seen Baltimore and San Francisco, such statements as these appear indeed infantile, silly. One of the most serious pronouncements of the highest French authorities upon concrete is—and I give it to you verbatim:

"At San Francisco, as it was at Baltimore, the conflagration has put in evidence once again the absolute incombustibility of reinforced concrete."

Who ever said it did burn? But see what fire does to it. To continue:

"There were stone and granite went to pieces under the influence of first heating, then chilling; there were exposed iron floors that were directly in the path of the flames, became red hot and twisted cork-screw shape, distorting the lateral walls and collapsing in twisted masses; there did reinforced concrete stay intact."

But it didn't, and since the French have just gotten around to San Francisco, why it is going to be a pleasure for me to aid in their enlightenment by giving them a lot of photographs showing places where their reinforced concrete did not stand even as well as plain cast-iron unprotected.

Another high authority as ably states and apparently without a tremor, that:

"In Baltimore, without exception, all the tall buildings, the eighteen and twenty-storied ones that successfully resisted the fire, were of reinforced concrete."

That certainly was a jump for the one poor little three-storied affair about which our American concreters spouted so proudly. And still another authority who holds forth in the Bulletin of the Industrial Society of the North of France:

"At Baltimore, on the occasion of its famous conflagration that destroyed the greater part of the city, we could compare, but alas! at what a price, the resistance to fire offered by the different materials in construction; steel or iron used without protection became so distorted as to cause the collapse of the building in which it was used, wood burned (startling discovery), marble exploded and so did granite and stone. Alone the buildings constructed of reinforced concrete resisted. Their columns and floors were not destroyed."

I have always had good reason to esteem the French most highly, but I seriously maintain that of all the rich fabricators of the different reinforced concrete brands I have yet run up against, I have never found anything quite so rich as is the lot of stuff just now running through the (more or less concrete) French technical journals.

* * *

Concrete Has Made Good

CONCRETE has "made good" as a building material. If it is too much to say that it is the material of the future, accenting "the", it is not too much to say that its use will grow more rapidly than that of stone or brick in the next few years.

Just one thing has been shown by mishaps, some of them grave ones, which have befallen a few concrete structures. This is, that there is a "know how" to concrete construction just as there is to brick laying or stone masonry, and that the consequences of not knowing how are disastrous.

One accident has occurred which is strong argument in favor of concrete. In Tunis a six-story warehouse of concrete was built on a foundation insecure on one side. The building listed until the top was ten feet out of the perpendicular. But not a crack appeared in floors or walls, and when the foundation is strengthened the whole superstructure can be jacked up and restored without damage.

Nothing the matter with concrete in this case, but much the matter with the selection of a foundation. In other cases amateurish mixing has resulted disastrously. This sort of work is certain to disappear through the demands of builders, who realize the good qualities and the economies of concrete too thoroughly to allow the work of a few bunglers to discourage their use of it.—St. Louis Realty Record.

* * *

If the congregation of that Tennessee minister puts implicit faith in what he says, it must be a happy lot now-a-days, for he says that hell is a place of strong drink, tobacco, baseball, theaters and peek-a-boo shirt waists. What other inducements for a permanent home could a poor sinner ask?

New Styles in Wall Paper

WALL paper dealers tell me that the old-time border is almost a thing of the past, writes Robert Morris in Building Management. Naturally this is not to the liking of the manufacturers or the dealers. The prevailing custom of dropping the ceiling down to the picture moulding means a good many dollars to wall paper men. For if you were to use a border at all, you would probably use a 50-cent border with a 13-cent ceiling. So the manufacturer and dealer are losing the difference on two or three rolls for each room.

The manufacturers are giving special attention to designing attractive borders, with a view to reviving their use, but with little success, especially so, as the price of wall paper is sure to go up next year. This year's stock is selling at about the same rates for the various grades as have prevailed for several years past; but it was mostly made up before the rise of price of paper, colors, and several of the things which enter into the production of wall paper.

The lines, as a rule, show a great advance in artistic merit and excellence of color over those shown in previous seasons, the manufacturers seeming to find that it pays to cater to a more refined and educated taste. There are on the market many papers that appeal to the public simply because they are odd, even though oddity often means ugliness. In color there seems to be no prevailing tendency. The browns and tans, so much seen last year, are less in evidence except in duplex and ingrain papers, where the shades are still prevalent.

In the more expensive papers the fabric effects are largely in evidence. These include tapestry effects, tekkes, Japanese leathers and grass cloths, velvets, and English fibres in both printed and plain.

The less costly papers run largely to double tones. Some of these also have an additional printing, which relieves them of a too severe ingrain appearance. Papers for bedrooms are unusually attractive by reason of their being so highly colored, as last year. The lilac, the wistaria, and other softly tinted flowers are in vogue.

Upper third decorations are, of course, always in style for the dining-room; their use is extending to other apartments also.

Many beautiful effects in gray are shown. One or two factories are showing a great many papers with a happy combination of gray and green. Very few strong red papers are noticed in any of the lines, and only occasional patterns in the once popular delft colorings. Greens are still prevalent, and the reason is probably because their coloring usually looks well with most furnishings, especially with the popular mission styles. The chintz and fabric colors are in evidence in bedroom papers, as well as natural colorings of flowers and foliage on white or colored grounds. Dresden colorings are also seen quite a good deal. Metals are used to some extent, but, as a rule, quite differently from the fashioned gold parlor papers, and show evidence of much greater refinement of taste.

* * *

We may yet have to remain married to our own wives if these legislatures do not take to attending more closely to their own business. Just see what South Dakota has done. Gone and shut down the divorce mill right at the time the Easter bonnet bills are due.

Cement and Concrete

Concrete Construction for Bridges

CONCRETE has come as a substitute to many of the building lines. In bridge construction it has apparently filled a long-felt need. Up to a very recent period, a time well within the memory of many persons now living, says an exchange, there was but one alternative, that of the stone arch, and this form of construction was not only very costly, but also failed to lend itself to many locations. The cost of stone masonry has been, and is yet, in many instances, prohibitive, and a makeshift has in the majority of cases taken its place. But even with its use there has ever been the desire to make it as permanent as possible, and to this end the present age of iron began to make itself felt in bridge construction. About sixty years ago iron was first used by the introduction of wrought bars into wooden trusses, these bars being in tension, while the wood was, generally, in compression, although it was merely common sense which placed them so. At that period engineers were just beginning to study trusses and the strength and loading of the various members, and even as late as 1875 the most of the companies which were then building iron bridges did so by guesswork and main strength. In the evolution of the iron industry the bridges built of part wood and part iron gave way to those in which the tension members were made of wrought iron and the compression of cast iron. Owing to the brittleness of the latter metal, it was soon discarded, and bridges were generally built of wrought iron throughout. The discovery of the Bessemer and open-hearth processes for the manufacture of steel produced a metal with so much more strength than wrought iron that engineers generally adopted it, believing that the question of permanent bridge construction had been solved.

There were a few engineers, however, who shook their heads and said that this, too, was a makeshift like the rest. Of a little longer life, perhaps, and good while it was new, but—how long would it last? The steel enthusiast replied that it was good for just so long as it was kept properly painted to prevent corrosion and consequent loss of material. It was found that this was not the true answer. Steel may last in its entirety so long as it is kept perfectly protected from corrosion; but when it is subjected to a great number of vibrations, even though they be well within its calculated strength, it becomes "fatigued." Under continual vibration the molecular form of the metal becomes altered in a manner resembling crystallization, and it has often been noticed that a rod which has been so changed in character is more brittle than cast iron. So the engineers who shook their heads have been to a degree justified by the results, and

steelwork can not be considered as permanent unless it is protected from erosion and is free from vibration.

The protesting engineers did not content themselves with shaking their heads; they began to look for some material or combination of materials which might meet the necessary requirements. It must be plastic, strong, economical and permanent, and, in reinforced or armored concrete, they claim a good result. The design and construction of bridges built of this material has, as a matter of course, been governed by the same laws of evolution that controlled the progress of the iron bridge. Francois Monier was among the first to avail himself of it, and, in 1867 took out his first letters patent on the use of steel for tensile strength in his concrete. Perhaps the greatest impulse to the industry was given by the work of Francois Hennebique, another French engineer, who, between 1892 and 1902, furnished the designs for about 10,000 structures costing nearly \$100,000,000. In this industry the American engineers have trailed far behind their European brothers. Only in the past ten years has any real progress been made in this country, but we are now equaling and will soon surpass the work on the other side of the water, both in design and in quantity.

One fine example of this form of construction is that of the bridge at Chatterault, France, built in 1898. It is 26 feet wide by 450 feet long. The center span is 164 feet and the two end spans each 135 feet in the clear. All arches have a rise of one-tenth the length and the arch ring is but 20 inches thick. This bridge was built in three months and cost but about \$40,000. Upon completion it was rigidly tested by government engineers and gave entire satisfaction. The most remarkable feature shown by these tests was that a load concentrated upon one arch caused a slight rise in the adjacent arches, an evident proof that reinforced structures are truly monolithic.

An excellent example of American work of this sort was erected in 1905, in a bridge over the Wabash river. It is 695 feet long, and the cost was slightly less a foot of length, although the prices of materials and labor are greater than in France. One reason for this saving is, however, due to the peculiar construction. In this bridge, the abutments are each connected to the first pier by means of steel rods imbedded in concrete under the bed of the stream. These rods take care of the thrust of the arch, which must otherwise be provided for by heavy masses of masonry.

In strong comparison with the endurance qualities of other building material are those of reinforced concrete. It is in no sense subject to decay, and when it is used in sea water for the foundation of a pier or wharf it is unaffected by the teredo, which so quickly destroys timber. It is not affected by rust nor by the carbonic acid in the atmosphere. When properly constructed it requires no maintenance charge for painting or for any other kind of protective treatment. The various tests which have been made by the building bureaus of great cities, as well as by the involuntary test of great conflagrations, have shown that its power for resisting fire—and even a combination of fire and water—is greater than that of any other known type of building construction. The purposes to which reinforced concrete are now put are almost innumerable. At Playa Del Rey, near Los Angeles, is a notable bridge of this material. The extreme length of this structure is 205 feet 8 inches. Its span is 146 feet, which is 15 feet longer than any other cement bridge span in the world. The width is 19 feet, the spring 18 feet and the height above water 20 feet.

Engineering News, in its issue of April 18th, declares that the first



Dry Creek Bridge, Stanislaus County, Cal. Span 112' Ry. 26'
Pacific Construction Co., Contractors *Jno. B. Leonard, Engineer*



Another View of the same Bridge.

steelwork can not be considered as permanent unless it is protected from erosion and is free from vibration.

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Another View of the same Bridge.



Ripon Bridge between Stanislaus and San Joaquin Counties. Two 100' Spans
Pacific Construction Co., Contractors. Jno. B. Leonard, Engineer.



Another View of the same Bridge.

concrete arch bridge, either plain or reinforced, to be built in the United States, was the Pine Road bridge over Pennypack creek in Philadelphia, Pa., built in 1893 of plain concrete. This is the bridge referred to by Geo. S. Webster, M. Am. Soc. C. E., in his paper read before the Association of American Portland cement manufacturers. The Pine Road bridge, however, is not the first concrete bridge to have been built in the United States. In 1889 Mr. E. L. Ransome designed and built a reinforced concrete arch bridge in Golden Gate park in San Francisco. An illustration of this structure is given in Reid's Concrete and Reinforced Concrete Construction, and its historical prominence has been somewhat widely exploited in other ways.

The illustrations accompanying this article are of bridges designed by Jno. B. Leonard, C. E., and constructed by the Pacific Construction Company of San Francisco. Both structures are of reinforced concrete. One crosses Dry creek in Stanislaus county, California, and the other is known as the Ripon bridge, which joins Stanislaus and San Joaquin counties. The bridges are of concrete reinforced with corrugated bars.

* * *

The Artistic Impression of Reinforced Concrete

A NUMBER of Pacific Coast architects, who have had experience with reinforced concrete construction, have contributed their opinions in a special number of the American Architect. The entire issue is devoted to a discussion of the architectural treatment of reinforced concrete buildings. Under the caption: "On the Artistic Expression of Reinforced Concrete" two California architects contribute the following:

By W. Garden Mitchell, San Francisco—I think it is Ruskin who says that "a building only begins to be architectural when something is added which is not absolutely indispensable." In this I agree. The architectural reaches beyond the utilitarian, and if in reinforced concrete we are to confine ourselves to anatomical lines, posts, girders and floor-slabs worked out by formula, I do not see that we are to get anything much more interesting than the steel frame of the skeleton-construction type. Structurally, in my estimation, reinforced concrete admits of greater possibilities than any of the materials hitherto used in the art of building, for on account of its cohesive strength, its capacity to withstand compression and its monolithic character, it can be used as a vertical post, horizontal beam or slab, and, furthermore, projected as a cantilever in a manner which perhaps is only possible with wooden construction. But Portland-cement concrete has an ugly color and must be covered with some surface other than its own.

The beauty of stone lies not only in the color it possesses and which all artificial substitutes fail to equal, but also in the endless variety of color from stone to stone, giving the whole a charm compared to which all artificial compositions imitating stone are lifeless. This brings us to the conclusion that an imitation of stone in concrete is not a rational solution.

First, then, I look to the plasterer's and modeler's art to embellish a reinforced-concrete building. The post, the arch, the lintel, the projecting balcony, the overhanging cornice, the groined ceiling and above all the dome, are eminently suited to the material; but for the artistic finish of these we must look first to the plasterer and modeler. Where the building has not to be all windows I look for beauty to great, smooth surfaces of tinted plaster with, at the window and door openings, embellishments

in rich examples of the modeler's art applied to the surface after the structural part has been completed. The whole tinted in some of the many tones that they apply so successfully in Mexico to their stucco buildings, ranging from pale blue and delicate green to the pinks of the sea shell and the stronger tones of orange and the like, or the whole brilliant in the white of the pearl or the restful white of ivory, or partly colored or decorated with bands and stencils. Where money is more plentiful, the flat surfaces may be covered with colored tiles.

In my experience I recall only one successfully treated building of this character; it is in the City of Mexico; the tiles are blue, orange and white, or mosaic (marble or glass) or slabs of marble may be successfully used.

The idea to be shaken off is that the architect is to be tied down to the least concrete that will do the work in safety. If owners will agree to pay only for that, they cannot hope to get anything at all presentable, not to say beautiful, in reinforced concrete.

By Morgan & Walls, Los Angeles—Reinforced concrete is a structural material the same as steel, and we see no reason why it cannot be masked and treated, the same as we would a steel building, with terra-cotta, brick, stone, or any other material that the architect may choose to use. We have used terra-cotta on the exterior of our buildings where reinforced concrete is used structurally in precisely the same manner as when steel has been used, and pressed brick or stone can be used in the same manner, being supported on ledges and thoroughly anchored, the same as we would handle a steel structure.

Of course, if one wishes to study economy and honest expression of construction he can finish the concrete direct, carrying out any order, or any other architectural decorative features that he may wish to incorporate in the building. The architect has just as much scope in the treatment of a reinforced-concrete building as he has in a structural steel building. Cost is the only thing that curtails him in any treatment that he may desire to make of the building. It is less expensive and perhaps fully as effective treated wholly as cement, all moulds and other enrichments being cast or run in cement.

Mr. Mitchell Adds to His Views.

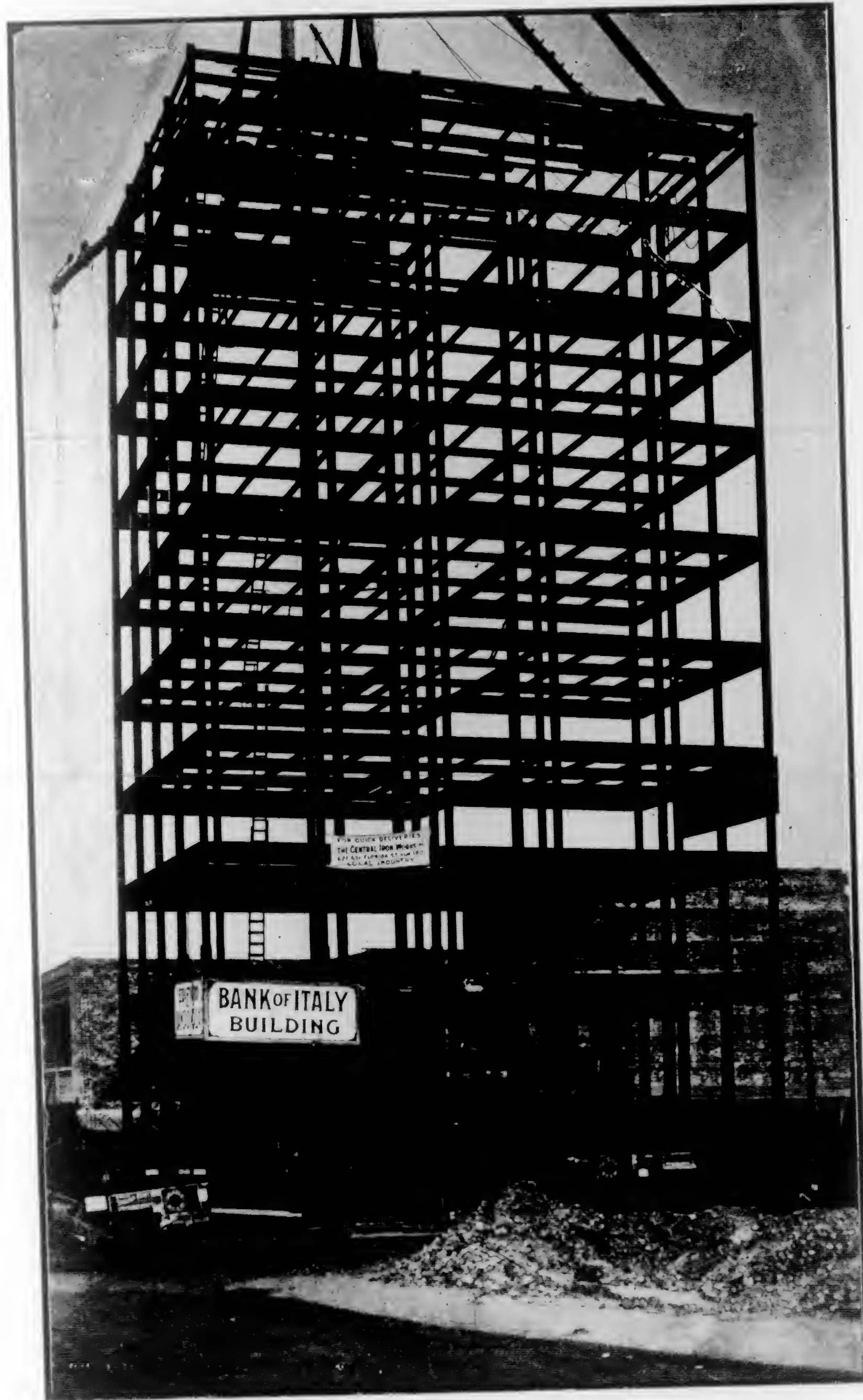
Since expressing my views as quoted above, I have read and studied the suggestions of the thirty architects who responded to the request of the American Architect to give their opinion on this subject of "The Artistic Treatment of Reinforced Concrete." I conclude that there is a consensus of opinion thus far, that stone should not be imitated or, indeed, anything; that the color of Portland cement is bad and must be covered up. Some suggest covering with a thick veneer of brick stone, terra cotta, and so forth, much in the same way as with the case of a steel frame. Others fall in line with my own ideas, which are to cover the surface with stucco, tile and mosaic or marble and depend for effects more on a polychromatic treatment of broad, flat surfaces rather than in the embellishments produced by columns, pilasters and projections of bands and cornices, all of which while quite possible are not the most direct expression of concrete construction. Another idea that comes to one in the study of these various opinions, is that as Solomon found it, "There is nothing new under the sun," that is in the fundamental necessities of building, for are not windows for light and doors for entrance, columns



*Residence of Mr. A. N. Judd, Watsonville
W. H. Weeks, Architect*

for support and floors to walk on just as it was before the dawn of history, and whether we build in stone or concrete or wood these fundamental necessities in size and shape remain the same in all ages, and I think the solution of the problem of how to build artistically in concrete is more to be found in the wise selection of models and styles that have already been proved suitable in times gone by to the artistic rendering of similar material and not in an endeavor to create a new style when no new style is demanded by the material. Simple and pleasing shapes and a decorated surface either in color or low relief would appear to be the fundamental necessities. In monumental buildings I can imagine the Church of San Sophie at Constantinople a monolithic or even for Bentley's new cathedral at Westminster, London, depending for beauty more on the shape of their masses and decorated surfaces than upon a thousand details of columns and cornices. In the Far East such styles of architecture have proved successful in times past, and with similar cloudless skies and strong sunlight here in California we should not fear to imitate those smooth and colored surfaces, only in low relief which were the glory of the Moor and that country from which as a colonist he went forth to show to the people of the West that not only in structural lines but also in decorated surfaces beauty is to be found.

W. GARDEN MITCHELL.



Steel Frame, Bank of Italy, San Francisco.
 Erected by C. A. Blume Frank T. Shea, Architect

Modern Steel Buildings*

By MR. JOHN M. EWEN, M. Am. Soc. C. E.

I SHALL speak to you this afternoon about modern steel buildings, and also about the modern methods of business organization which are necessary to the rapid and efficient construction of such buildings.

The first big building in which the idea of a steel frame was used to any extent was the Home Insurance Building in Chicago. This building was erected in 1883. Only twenty-four years have passed since that time. You can see, therefore, that the whole revolution in modern building construction has been condensed into a space of less than a quarter of a century.

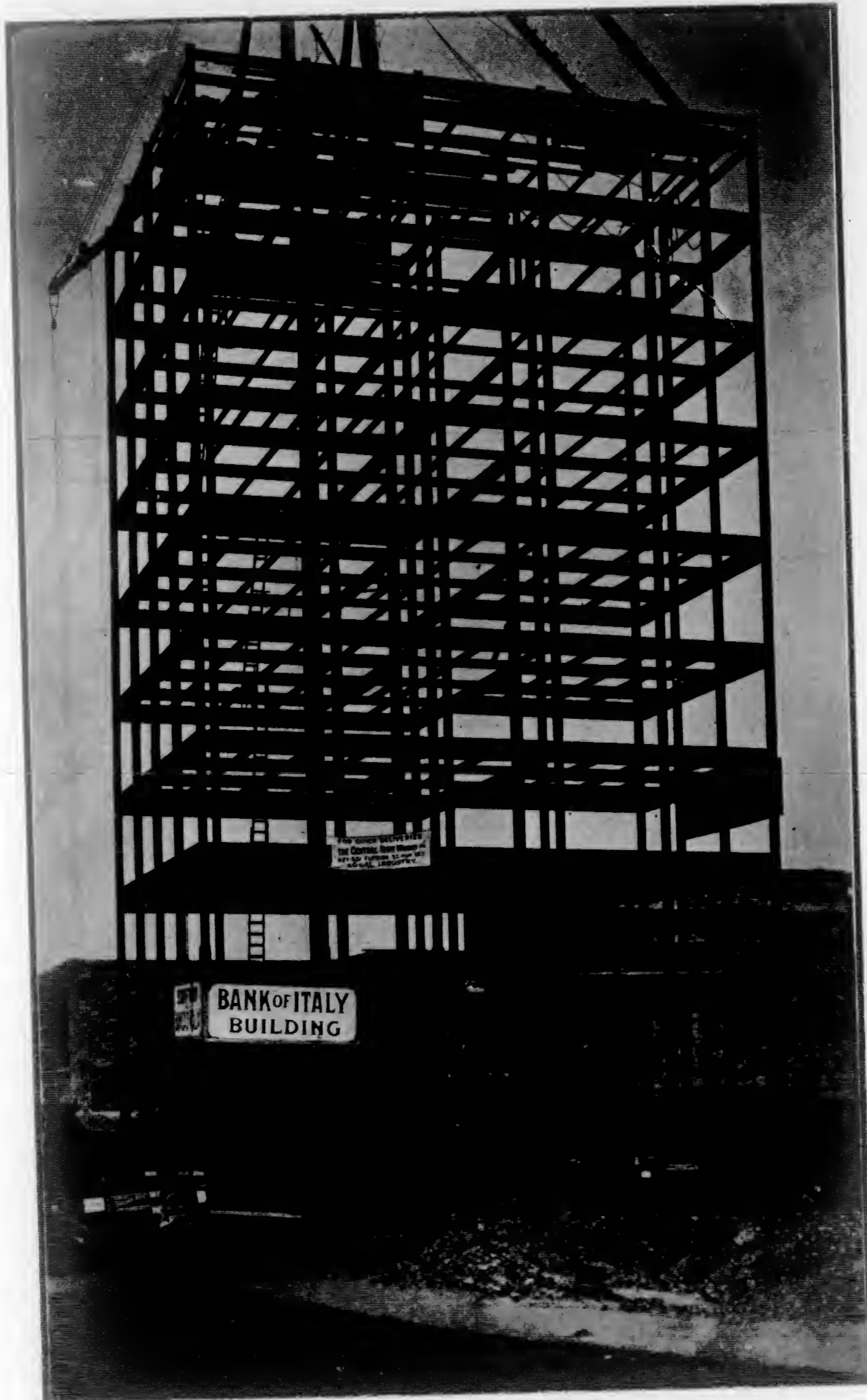
The principle first embodied in that building has completely changed the character of big building construction. But there has been a change, not only in the buildings themselves, but in the methods of organizing the architects, the engineers, the contractors, and the artisans who construct the buildings. Fifteen years ago the erection of an eight or ten-story building was considered a good year's work. Today a building twenty-five or thirty stories high can be erected within that same length of time. This change is due to improvements in methods of work. The modern construction engineer, engaged in the erection of big buildings, has a business organization which differs from the business organization of twenty-five years ago almost as much as the steel building itself differs from its solid-masonry predecessors.

As an example of the rapidity with which a modern engineering force can work, we may take the Sears-Roebuck plant on the West Side of Chicago. This plant consists of four large buildings. The largest in the group is ten stories high, four hundred feet wide and sixteen hundred feet long. The total cost of the plant, including all buildings, was more than four million dollars. Yet the whole job was done in eight months. In other words, building construction has not only changed, but accelerated. It is not only different in materials, but different in methods. It has not only more steel, but more speed.

And, by the way, the speed is just as important as the steel. When an old building is torn down in the heart of a great city, the owner loses his rents from the time when the old tenants are turned out to the time when the elevators begin to carry the new tenants to their new offices. Can the engineer constructor have that new building ready in ten months, or will it take him eleven? The difference of one month is important. There are office buildings which have a monthly rental roll of fifty thousand dollars. That sum represents to the owner the difference between an engineer constructor who can put up his building in ten months and the engineer constructor who cannot do it under eleven. It is therefore absolutely necessary that the modern engineering force should be able to do its work, not only with the utmost care, but with the utmost rapidity. This means that the best type of engineer constructor, in order to be able to handle big building operations, must have in his own office, or else closely associated with him, all the different kinds of talent which go into the construction of the modern skyscraper. In other words, the modern engineer constructor is not an individual. He is an organization.

You will be able to see what I mean if I just name the different kinds of trained men who ought to be included in an engineering force com-

*Paper read before the students of the School of Practical Science, Toronto.



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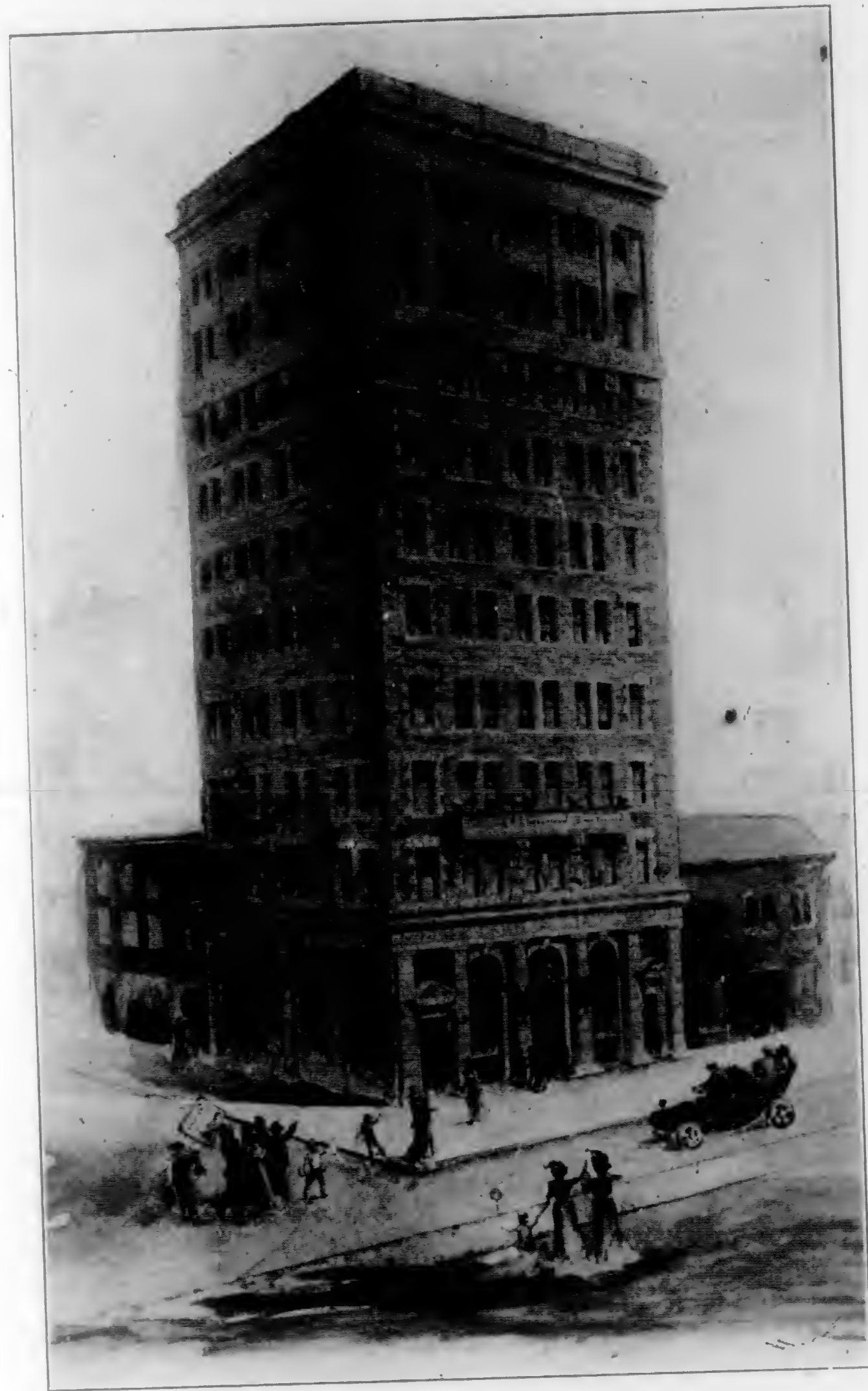
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*Bank of Italy as it will appear when finished
Frank T. Shea, Architect.*

petent to perform a modern building operation with the smallest possible loss of time. An architect; a civil engineer; an electrical engineer; a mechanical engineer; a structural engineer; a sanitary engineer; a fire protection engineer; a purchasing agent; a construction superintendent; an operating engineer; an accountant. For the best work, it is no longer advisable to have all these men in separate offices of their own and to call them in from time to time in an advisory capacity to superintend their particular part of the work. It is better to bring them into what is, in effect, a single organization. They must work like the players in a football game, not as individuals, but as a team. And they must have a captain, whom they all trust and whom they all obey. He is responsible for every play in the whole game. He directs every movement. But he must have men under him who know their own specialties, just as the left tackle in a football team knows how to be a left tackle, or the half-back knows how to be a half-back. The captain can then send that team down the field and have it under complete control, and know what every man is doing every second. The difference between the old style football of fifty years ago, when the players roamed all over the field very much at their own sweet will, and the modern organized football, in which the whole team is under perfect control and moves like one man, is the difference between the scattered individuals who used to collaborate in the construction of a building fifty years ago and the modern, compact engineering force which brings all those individuals together in one team and which can calculate, almost to a day, the exact time which it will consume in getting a certain piece of work done.

* * *

California Gypsum

Frank L. Hess, of the United States Geological Survey, has recently made a tour of the gypsum fields of California and has returned to Washington laden with specimens. He will prepare a bulletin on California gypsum for publication in the near future.

There are now four gypsum mills in the State, one at Amboy, one at Los Angeles, and two at Palmdale. Of those at Palmdale one is still in process of construction. The product of these mills is consumed in the State. It is used mostly for wall plaster, but a smaller amount is ground for fertilizer. Generally speaking, the gypsum runs from 54 to 90 per cent pure. Deposits occur, however, in the form of alabasters which are very pure and are suitable for the manufacture of plaster of paris, but they are far from railroads, and so at present unavailable.

The deposit at Amboy is found in the middle of the Mojave desert, along the tracks of the Santa Fe railroad. The plant is situated near the bed of an old lake around the edge of which the gypsum has been deposited. Gypsum sets very quickly, usually in about five minutes. Because of this, a retarder often consisting of slaughter-house refuse, dried and powdered, which delays the setting from fifty minutes to two hours, is employed. There is nothing peculiar about the California gypsum, as distinguished from that of other localities, except the fact perhaps that at one of the plants it is necessary to regrind the gypsum after calcining it.

California producers are fortunate in being able to use oil as a fuel in their gypsum mills. Not only is it a cheaper fuel than wood or coal would be in that State, but it is better suited to the exigencies of the work, as the heat of an oil flame can be more easily and quickly graduated than can that of furnaces which burn wood or coal.

Return of the Tile Roof

TILE, when properly formed, baked and laid on any structure rightly designed to carry it, is the most beautiful roof covering yet devised, but when not properly formed, baked and laid, or laid on buildings for which it is not rightly intended, tile may be not only the ugliest, but the least serviceable of coverings.

Four hundred and thirty years ago it was provided by law in England that for the making of tiles "clay should be dug before November, and be stirred and turned before March," and today the very old tile is considered much better than the new. The same care is not taken in turning out the commercial tile in use at the present time. A good, hard-burnt tile lasts indefinitely; a thing of beauty, it comes very near being a joy forever; it is delightful in color, charming in form, and useful in service. A poor tile has little to recommend it. The hard-burnt tile is, comparatively speaking, impervious to moisture, while those half-baked, out of poor clay, not only absorb moisture, but in a damp climate grow a luxuriant crop of vegetation, which may be very picturesque on outbuildings where dryness is not a prime essential, but not altogether desirable on a dwelling.

The Mission fathers no doubt followed the ancient custom of kneading or working the clay in pits under the hoofs of animals, then giving it time to ferment properly. The tiles were probably made by spreading the right quantity of clay on a board or flat surface, patting it to a cake of the right thickness and size, then deftly flopping it over a half-round piece of board which was first well sanded so the clay would not adhere. The clay was pressed and shaped to the form by hand, trimmed about the edges, dried in the sun, and fired more or less perfectly in small kilns. The pressure of the hand gave the tile a consistency and a surface which machine-made tiles lacked. The latter are more or less porous.

The quality of the tile differed with the clay of different localities, and with the care and skill of the makers. Some are soft and very irregular, others are comparatively hard and true. Throughout the Southwest a great variety of clay is found, from the sticky adobe, which is little more than a tenacious mud in places, to fine potter's clay. The Mission builders took their clay as they found it and made the best of it. Transportation was too difficult in those days for them to seek and develop the finer deposits.

The thickness, size and irregularities of these old tiles and the marks of the hand which shaped them are fairly well indicated in the illustrations. The dimensions of those shown are: Length, 23 inches; width of broad end, 12 inches; width of narrow end, 8 inches; depth, $4\frac{1}{2}$ at end, diminishing to $3\frac{1}{2}$ at narrow, thickness varied from $\frac{3}{8}$ to $\frac{3}{4}$ of an inch. There are no holes for nails or other fastenings. Neither are the corners clipped to economize in laying. It is a delight to caress these old tiles just as it is a delight to pass one's hand over a piece of fine pottery, for, after all, the fingers appreciate good modeling better than the eyes.

* * *

A man in Altoona, Pa., has discovered a method of preparing wood and coal ashes so they can be burned again, same as if they were coal. Possibly he has been taking lessons from the gentleman who is supposed to be able to find substance in a departed soul which will burn for a considerable time.

Five Problems That Must be Solved

"SAN FRANCISCO," says a shrewd northern observer, "suffered much from the dishonesty of her officials; and she will suffer more from the indifference of her private citizens." The honest desire of every patriotic citizen is to purge San Francisco of municipal graft and corruption, to restore her financial, commercial and industrial credit, and to pave the way for civic peace and industrial prosperity.

No wonder that both head and heart sometimes ache when the patriotic citizen contemplates, and attempts to analyze, the various difficulties, intrigues and dissensions that now involve this community. On the one hand we are told that the gentlemen responsible for the prosecution of the grafters and corruptionists are of the highest and most unselfish mind and purpose, and that their mode of procedure will be justified by the results. On the other, we are assured that the prosecution should not be willing at any time to sacrifice the heart of the public prosecution to the extent of granting immunity to so many of the proven vicious and dangerous elements that have been so mistakenly elevated to political prominence, as it is claimed, by labor votes.

No wonder that the mind becomes confused in contemplating the vast maze of both evidence and misrepresentation, and in endeavoring to discern the cause and effect of all the alleged facts presented.

It would seem to the unprejudiced and impassionate observer that, beneath all the stormy confusion and the daily newspaper tumult lie several fundamental facts which at least stand out in vivid truth.

First of all: San Francisco too long has borne the reproach of disorder, violence, lawlessness and riot upon her streets. Her good name has been impugned from one end of the country to the other. Her credit and confidence have been stung. The responsibility of her citizenship has been questioned. The authority and stability of her government and its protection to life and property has been questioned. No American citizen can view without alarm such conditions as have obtained for several months in the government and administration of this city. The basic principles of a Republican form of government and the very essence of Democracy have been repudiated and insulted by the perpetuation in office of a convicted Mayor and sixteen self-confessed criminal Supervisors—the latter "good dogs" only while under the whip of the District Attorney's office. So monstrous have these conditions grown that we have come to regard this juggling unwarranted and against the constitution—almost without surprise or objection. The greatest evil that today assails this Republic is found in a well defined contempt for the letter and spirit of the law. When the statutes are held so cheaply as to make it necessary for an individual to usurp the functions of the Court, and when the good conduct of the Board of Supervisors is made dependent on a single individual, no matter how fair minded, then both the law of the land and the institutions of government are in danger of being still less respected by the average citizen.

Secondly: it must be apparent to every unprejudiced observer, who carefully studies the situation—even though his sympathies are entirely with the basic principles of Trade Unionism,—that the Labor Unions of San Francisco, in their domination both of industry and of politics, have been tried in the balance and found wanting. Nor is this an aspersion upon Trade Unionism itself. The truth is that the Labor Unions of San Francisco have not yet "found themselves," or their proper place either in the attempted control of industries or politics. Trade Unionism as a dominant factor is still young in San Francisco; it has not yet chosen as leaders men of such integrity, patriotism and intelligence upon whom it can rely implicitly. Its first excursion into civic politics has proved a failure lamentable for the city and disgraceful for labor;

its extravagant demands and unfair dictation, coupled with an unprecedented rise in the prices of necessities and material, precipitated abnormal conditions under which the reconstruction of San Francisco and the rehabilitation of her prosperity could not permanently advance. The failure of Trade Unionism need not, and will not, be permanent. Organized Labor can learn its lesson as well as Organized Capital which is also getting its share of discipline.

Thirdly: As a corollary to the above proposition—the failure of Labor Union rule both in the control of industry and politics—the unprejudiced observer must realize that in this Republic, under a Democratic form of government, the people must rule. In any dispute between Labor and Capital the voice and judgment of the third party—the consumers and passengers—must assert itself. As in industry so in politics, unless the people work and vote for their own interests, the reins will fall into the hands of a class representing either organized capital, organized labor, or organized graft.

Fourthly: The frank and free observer must take cognizance of his own responsibility for all the corruption, sham and disorder that have obtained in San Francisco. The responsibility of individual citizenship has been held too lightly in California. Life has been regarded too cheaply, and transgressions of the law and violations of order have not been regarded with sufficient jealousy and severity by all classes concerned. In reference to the shameful disclosures of graft and corruption in this city it must be remembered that the practice of legislators, in Boards of Supervisors and in City Councils, throughout the State, has been to frequently accept "fees" or other remuneration, and favors, that could not even be qualified by being called "questionable," in return for their services favorable to certain interests at public expense. It is notorious that for many years few bills, even when designed for purely patriotic purpose, could pass both the Senate and the Assembly of the California Legislature without their sponsors' enlisting the services of special lobbyists, either in the guise of attorneys who perhaps chanced to be members of the Legislature or special agents of corporations. The acceptance of "fees," or other less direct remuneration, for special services in the Legislature or on Boards of Supervisors or City Councils has been so notorious that the average citizen has come to regard this practice generally with indifference or occasionally with despair. And yet we, the people—each individual voter who helps to send such men to public office,—are directly responsible for such infamous practice. It is all too true and too shameful a conclusion that we get no better and no worse government than we ourselves are responsible for and to which we are entitled. The shame of San Francisco's graft and corruption is visited upon each and every one of us, and our civic responsibility must be realized, felt and acted upon before we can look for amelioration.

Fifthly: No fair observer of current conditions can fail to observe with surprise, and indeed alarm, the fact that certain fundamental rights guaranteed by the State and Federal constitutions have been ignored and are contemned in this community. The right of the individual, under the law, to work when, how, where and for whom he please is undeniable and should be inviolate. The right of the small dealer, producer or manufacturer to all the competitive advantages accorded influential and opulent competitors should also be respected. The most sacred principle of American citizenship is involved in such liberty of the individual. On all sides, both employers and employed may be heard protesting against the tyranny of Trade Unionism, its frequently exorbitant demands, its irritating regulations and its too apparent determination to dictate to the employer concerning the conduct of his business or industry. But such protest is usually as weak-kneed and impotent as the protests of those who

suffer from the handicap of special privilege accorded to the trusts and large corporations. Despite such rebellion, the submission to the domination of Trade Unionism and the other evils mentioned hitherto has been almost universal in this community. The corporate interests do not openly defy the public, but this is not the case with Trade Unionism, for we are told by the mouthpieces of Trade Unionism that the "Open Shop" in San Francisco is an impossibility, and that "Surely Mr. Calhoun does not wish to be the instrument by which San Francisco is to be offered as a vicarious sacrifice on the altar of the 'Open Shop.'" If the "Open Shop" is an impossibility in San Francisco, involving as it does the undeniable privilege of men to work in lawful occupations free from the dictation or interference of any organized body of men, involving a fundamental right, without the full protection of which there can be no individual liberty either of employer, employe or passerby, then we must admit with shame that San Francisco, like some other large cities, prefers a tyrannical domination which is as unfair as it is un-American, and as unlawful as it is unjust. It has been charged that if the president of the United Railroads persists in the policy of the "Open Shop" he will be responsible for the "commercial ruin" of San Francisco. As to the other charges brought against Mr. Calhoun, let them rest until proved; but as to this specific charge, it is obviously based upon a fallacy. Mr. Calhoun is a builder, not a destroyer. His company forms at once the greatest single investment in San Francisco and is the heaviest taxpayer. Last year alone the United Railroads spent over six million dollars in the improvement of its system. Instead of conspiring for the "commercial ruin" of San Francisco, Mr. Calhoun and other sturdy American citizens realize that the future peace and prosperity of San Francisco and the entire country depend upon the elimination of special privilege or advantage to producer, manufacturer, merchant, trust, corporation, or wage-earner, the last named apparently seems the most difficult to control. If this can be accomplished all may enjoy the blessings intended by those who framed the Constitution of these United States, which guarantees "life, liberty and pursuit of happiness," etc.

These five main considerations must be apparent to the unprejudiced observer and honest thinker. In their assimilation and in a determination to work,—and if needs be fight,—for their establishment, lies the highest ideal and the noblest practice of citizenship.

* * *

The Quantity of Brick Required for a Skyscraper

Some idea of the immense amount of material required in the construction of an ordinary skyscraper may be gathered from statements of one of the experts in charge of the construction work in connection with the new 25-story building which is being erected in Wall Street, New York City, for the Trust Company of America. According to his calculation there are 5,000,000 common bricks for interior use; that is, inside the walls. Then there are 247,000 maroon bricks for the outside, to go with the marble trimmings above the seventh story; 247,000 buff colored bricks, not to mention several thousand red and buff bricks, that are being used in the angles of the buildings. Most of these bricks are $8\frac{1}{4}$ inches long and the aggregate length of the entire lot would be, say, 45,680,250 inches, or 3,806,687 feet, or a little over 720 miles. He states that in an ordinary 25-story building there would probably be a still larger number of bricks, as in the present instance considerable marble is being used to bring out a colonial effect.

Redwoods of California

THE large resources of the Pacific Coast redwood forests have been little used up to the present time. Until recently this timber only had use locally, but now it has become a competitor of many woods in the Eastern markets. It is being much used in the East for shingles instead of cypress, and to some extent for flooring, siding, laths, and finishing work. There is reason now to believe that its field of usefulness as a structural material will become extensive in the East also. Apropos of this situation the following recent letter is significant:

"U. S. Forest Service,
"Berkeley, Cal.

"Dear Sirs:

"We very much desire that the U. S. Forest Service, at its earliest convenience, will make a comprehensive study of the physical and mechanical properties of redwood lumber.

"The very many inquiries from parties actively engaged in construction work, that are now constantly being made for reliable information concerning redwood, only emphasize the need of the results of the official study of its properties that we now most respectfully request may be made.

"Hoping for your early and favorable consideration, we are,

"Very truly,

"(Signed) REDWOOD ASSOCIATION,

"By A. B. Wilcox."

The Forest Service has decided to comply with the request of the Redwood Association. The work will be done at the testing laboratory in Berkeley, in co-operation with the University of California, and it is thought that the results of these tests will prove of great interest to the users of lumber throughout the United States.

* * *

Where Ignorance is Bliss

"What is a 'Class A building?'" inquired a new arrival at the Hotel Jefferson. "I've been seeing it in the papers right along."

"Ah," responded the night clerk, rubbing his palms together and frowning thoughtfully, "a 'Class A building' is a building—well, it's this way. They divide all the new buildings in San Francisco since the fire into three classes, A, B and C. Class C is anything under five stories; Class B is anything from five to ten stories, and Class A is any building from ten to fifteen stories."

"Oh, very simple, indeed. But what do they call those buildings that are more than fifteen stories?"

"Those, let's see. Oh, yes; those are what we call the re-enforced concrete type."

"Thanks very much. I hope I don't seem too inquisitive."

"Not in the least; oh, not at all. We hotel clerks are only too glad to supply guests with reliable information about the city."—Chronicle.

* * *

The beautiful Vendome Hotel in San Jose has recently been rebuilt from plans by Mr. Weeks, who is also the architect of the palatial Dougherty mansion now under construction in the Garden City.

A Plea for Better Building Inspection

THE following letter has been received by the San Francisco Building Inspector from the headquarters of the International Building Commissioners' Society, at Washington. The matter is one of the most important that confronts a municipality today; vastly more so than are most of the political and economic problems to which the press devotes so very much space. The letter is as follows:

"Dear Sirs:—Great conflagrations like those of Baltimore and San Francisco center popular attention for awhile upon the importance of the fire question, but between times we seem to forget that fire is the greatest economic waste of a ruthlessly prodigal people. We have gotten to the point where our "normal" fire loss is nearly a million dollars a day. With all our phenomenal building activity we scarcely replace the destroyed property. It is a condition that is intolerable, a waste that is positively indecent, a national crime. Our average lesser city that escapes with a loss of a half million a year feels particularly lucky; in Europe a city of similar size that has \$50,000 of fire loss thinks itself sorely stricken indeed. It behooves us to whom is intrusted, to a degree at least, the safety of our cities to not wait for the next great conflagration to inspire vigorous action, but to keep hard at work and most earnestly endeavor to ameliorate the conditions by every means in our power.

"Our attention should first be given to the new buildings. We must see to it that no more fuel is added to our already over-combustible cities. The society has adopted a uniform and model building ordinance, but since the Underwriters have come out of their lethargy and awakened to the full importance of safe construction and are hard at work in an effort to get the city authorities to adopt their model building code, we should be thankful for their co-operation and, rather than have divergence of effort let us forget our own code and clamor loudly for the adoption of theirs, anything that will give us better, more fireproof new buildings.

"Let us beseech our cities for more authority and more assistance so that we may also carefully inspect, and frequently, all the old buildings. We should compel their owners to eliminate the fire-traps, to close off open elevator and stair wells, to protect their exposed windows and to minimize in every way possible the fire hazard. We should constantly preach the diminution of units of space in buildings, cutting these off with fire walls, fireproof doors, etc., so as to confine the fires that are bound to occur to narrow limits within which they can easily be fought.

"Nothing can help us more in this arduous and oftentimes thankless task than fraternal co-operation and mutual support between ourselves. We should oftener get together and in the absence of that possibility our intercommunication by letter should be most frequent. The experience of one is bound to greatly help all the others and perhaps prevent many of them from having to go through the same ordeal. Make of me a medium of exchange. I am only too glad to get personal letters from you, copies of your reports, etc., that in turn I shall do all I can to transmit to the others. Just now I am particularly anxious to receive reports showing the cost of your office, giving number of assistants, etc., to your city; what steps have been taken to enlarge the fire limits; what failures, collapses, etc., of experimental and defective buildings have you had since January 1st; what development has there been and the general feeling there is toward curtailing the height of buildings. Indeed, anything that interests you will be of interest to us all. Sincerely yours,

F. W. FITZPATRICK,
Executive Officer."

Successful Heating by Hot Air Furnace

IN CONSIDERING the heating of a modern building by means of a hot air furnace, the first and most important consideration will be the location of the furnace itself, and of the registers. Air, like water, will always flow in the direction of least resistance; therefore, it naturally follows that in placing registers in a room great care should be taken to favor that location where the least resistance will be met with from the incoming flow of air. As cold air is denser and heavier than warm, it follows that the proper location for a register in a room should be the warmest place in that room, i. e., on that side farthest from outside influences. Having first located the registers, place the furnace, keeping three facts in mind. First, remember that the greater the elevation of a warm air pipe the more rapid the flow of air; second, that the air will flow more rapidly toward the point of least resistance; third, that the velocity of the air is dependent on the height of the outlet above the furnace and on the amount of frictional resistance in the pipe; in other words, on the length of the run and the pressure resistance in the room in which the register is placed. Therefore rooms having the greatest exposure in the direction of the prevailing winds, on the first floor, naturally should be nearest to the furnace and should have a larger pipe and register. Rooms which are remote from the furnace, necessitating a long horizontal run of pipe, should have larger pipes. Aim to minimize the frictional resistance in all pipes by avoiding all square turns or abrupt angles. Insist on having at least one inch rise to the running foot of pipe from the furnace to the register. Long runs of pipe, especially when going through cold rooms, should be wrapped with asbestos paper; pipes going through stone or brick walls should have thimbles one inch larger diameter than the pipe. In the adjustment of the pipe work, bear in mind that the pressure of the air is equal on all pipes at the furnace. If, therefore, some of the pipes do not flow as freely as others, the cause of that trouble may be looked for either in the frictional resistance in the pipes, pressure resistance in the rooms into which these pipes lead, or on the pressure of an adjacent pipe, having the advantage of elevation, and taking more than its proportion of the heated air. Should the trouble be caused by frictional resistance, look for obstacles to the free and natural flow of air, such as abrupt angles, etc., and remove them. If this does not furnish the remedy, then increase the size of the pipe. If the trouble is caused by pressure resistance in the room itself, this resistance is caused by air pressure in the room, and some outlet must be provided before satisfactory results can be obtained. A very satisfactory solution to this difficulty can be had by cutting an opening in the base-board of an inside partition between two studs, and utilizing the space between two studs and plaster walls for the vent duct. The plates on top of the studs must be cut, and the duct be unobstructed to the attic. Generally speaking, the air will find its way out of the attic, but in case it does not do so, an opening can be made in some unused chimney, or some other means employed to overcome the difficulty. When inside air is used all doors must be left open and chimneys or fireplaces closed.

* * *

If the water Wall street has been squeezing out of stocks of late could be used for irrigation purposes, there would no longer need to be a "semi-arid" West.

Among the Architects

American Institute of Architects (ORGANIZED 1857)

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Adams Cram, Boston, Mass.
For One Year—W. A. Boring, New York;
J. M. Donaldson, Detroit; Merritt J. Reid, San
Francisco.

*Executive Committee.

Next Convention at Chicago, Illinois

San Francisco Chapter of American Institute of Architects

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Kent Has Plan to Settle Labor Troubles

According to President S. H. Kent of the Builder's Exchange the organization of a Central Council of affiliated building contractors, as proposed by J. J. Phillips at the stormy meeting of the Exchange held June 11th will not be accomplished for some time, if at all.

Phillips' motion, it is claimed, was not regularly acted upon.

"What the Building Trades Council is to the unions the affiliated building contractors' organization will be to the con-

tractors," said Mr. Kent. "The complaint made at Tuesday's meeting that owners and contractors were responsible as much as unionism for the excessively high wage schedule prevailing in this city is only too well founded. Contractors, urged by owners to complete structures quickly, have been bidding against each other in order to secure workmen.

"The organization that I propose will put an end to this by uniting all the contractors in the city on a certain maximum wage for all classes of labor. Beyond this agreed figures they cannot go. If they do the employers of other classes of labor involved on the particular job will withdraw their men and tie up the work. Such an association will, in my opinion, solve the problem of excessively high wages and fortify us in making a healthy protest against any unreasonable exactions that might be attempted by the Building Trades Council."

Bids Wanted for \$500,000 Library

The university regents are to advertise for bids at once for the erection of the new Doe library, for which plans have been drawn by John Galen Howard, the university architect.

The front half of the building is to cost approximately \$575,000 and this is the portion to be erected now. The remainder of the structure will be put up as the funds become available. The State will be asked in future years to appropriate money for that purpose. The estate left by Charles F. Doe, amounting to nearly three-quarters of a million dollars, is to be used to pay the expenses of the first portion of the library building. The plans adopted by the regents at their last meeting call for a fireproof structure of white granite like that used in the mining building and California hall. The library building will front the north and overlook the botanical gardens. It will be 90 feet high and cover a ground space about 200 feet square. The roof will be of mission tiling.

Los Angeles Architectural Exhibit

The exhibition by the Los Angeles Architectural Club and Arts and Crafts Society held in the Associated Arts Hall at 718 South Spring street, Los Angeles, was a great success.

The walls of two large rooms were covered with architectural designs and photographs of office buildings and residences erected by Los Angeles architects. On tables were examples of artistic bookbinding, book plates, specimens from the Los Angeles Ceramic Club, including vases, plaques, panels, cups and jars, besides a large assortment of paintings and designs for furniture and fittings. There was also an excellent display of metal work.

The patrons of the joint exhibition were the Ebell Club, Los Angeles Chapter of the American Institute of Architects, Friday Morning Club, Ruskin Art Club and Los Angeles Fine Arts League.

The following committee acted as judges of the drawings: Elmer Grey, Los Angeles; Augustus B. Higginson, Santa Barbara; Timothy Walsh, Los Angeles; Charles Sumner Greene, Pasadena; Irving J. Gill, San Diego; Arthur Roland Kelly, Theo. Eisen, Frank Stiff and Francis P. Davis.

Six-Story Hotel

Architect P. August Westburg, of Los Angeles, has made plans of a six-story and basement family hotel building, 60x120 feet, to be erected on the east side of Broadway, between Temple and California streets, Los Angeles, for Julius F. Hall of Alhambra. It will contain one hundred and thirty rooms, fifty bath rooms, closets, etc. The building will be heated by steam and cleaned by the vacuum air system. It will have a passenger elevator, fire escapes, electric lighting, bells and telephone system. The exterior walls and partition walls will be reinforced concrete.

Sacramento Court House

Bids will shortly be called for for the erection of a new court house in Sacramento. Plans by Architect R. A. Herold of Sacramento have been accepted by the Supervisors. The sum of \$400,000 has been appropriated for the new building.

Two New Churches

Architects McCall and Wythe of Oakland have plans in their office for two churches to be erected in San Francisco. One is for the Methodist denomination, and the pastor is now in the East raising funds. It is expected that each will cost at least \$50,000.

San Francisco Second

According to statistics printed by Construction News of Chicago, San Francisco occupies second place in building activity, New York and Brooklyn being taken as one city. It is significant of this publication that this is the first time since the fire that it has printed San Francisco's statistics. The figures were included in the table only after considerable correspondence and effort on the part of the California Promotion Committee.

Hereafter the figures will be compiled regularly by the committee and printed in the Construction News. In the number of buildings, which indicates their character, there is a remarkable showing in the figures printed. Chicago had 1002 permits with but \$200,000 more in total value than the 420 permits of San Francisco called for, while Philadelphia had 2041 permits with \$200,000 less of value than San Francisco.

San Jose School Contracts Let

On May 28th the San Jose Board of Education opened bids for the construction of several new school houses and awarded contracts to the following:

Grant and Longfellow schools, Frank Davis of San Jose.

Lowell Grammar school, Morrison Bros. of Santa Clara.

Horace Mann school, Building and Construction Company of San Francisco.

Bids for the construction of the San Jose High school were not awarded to anyone, owing to a change to be made in the plans, but bids will be readvertised and will be decided on July 18th.

Bids for plumbing were also held over until that date.

The heating and ventilating contracts will be let at this time also.

Beaux Arts Society

The Society of Beaux Arts Architects of California was organized in San Francisco June 17th. Its object is the education of the younger men of the community who are striving to become architects. The meeting was held at the San Francisco institute of art. The following officers were elected: President, John Galen Howard; vice-president, Arthur Brown; secretary, W. Applegate; treasurer, Loring P. Rixford.

Preceding the meeting a dinner was enjoyed at the Fairmont. Among those present were B. R. Maybeck, Jules Godart, Charles Peter Weeks, Arthur Brown, Lewis P. Hobart, Loring P. Rixford, Albert G. Lansburgh, Mr. Van Benthuyzen, John Baur, E. F. Champnev, Mr. Applegate, John Bakewell, George W. Kelham.

Cannot Supersede Howard

Attorney Charles Snook has decided that Architect John Galen Howard, professor of architecture, cannot be superseded by the state architects in planning buildings for the University of California.

Under the law creating the office of state architect, Governor Gillett authorized Sellon & Hennings, the appointees to that office, to draft plans and have supervision of work on the Greater University, and the buildings at the State Farm at Davisville.

When this was done the Regents inquired into the status of things, asking Attorney Snook of the board to give an opinion after looking into the law. He says that Professor Howard cannot be superseded legally by the state architects, but should have charge of all work done for the university.

Move Downtown

G. A. Wright, George Rushforth, and B. J. S. Cahill, associate architects, formerly of 2277 California street, near Webster, have removed their architectural offices to 571 California street. During the past year they have been one of the busiest firms engaged in the rebuilding of San Francisco. They have outgrown their quarters in the Western Addition, and in establishing themselves "down town" are in line with the general movement in that direction. The firm's new offices occupy the second floor at 571 California street, near Montgomery, the premises owned and occupied by the Pacific States Savings and Loan Company and directly opposite the site of the San Francisco Savings Union building.

Vacation for Engineer Breite

W. W. Breite, the popular structural engineer, left June 15th on a two-months' business and pleasure trip. He will go as far north as Seattle and as far East as Boston. While absent Mr. Breite will study the steel construction work on some of the big office buildings under construction in Chicago, Boston and other cities. He will write of his observations in a series of specially prepared articles for The Architect and Engineer.

6208 Tons of Steel

It will require 6208 tons of structural steel for the Phelan Building. The material has already begun to arrive from the East. The American Bridge Company are the contractors.

Money in Sight for Rebuilding -

The San Francisco Bond and Mortgage Company has been incorporated and this action initiates a practical plan to bring funds to the city for the reconstruction of the burned district. The enormous amount of money required in the rehabilitation of San Francisco has already, it is said, drawn heavily upon the local banks and has exhausted, in a large measure, the usual sources of financial supply, yet the work of rebuilding the city is only just begun.

Loans will be made only on properties situated within the fire limits of San Francisco and no loan will exceed 60 per cent of the appraised value of the land and building. The borrower will be required to furnish the company with title insurance and fire insurance. All appraisements of values will be made by a real estate agent and by an architect appointed by the company.

Among the initial subscribers to the capital stock of the San Francisco Bond and Mortgage Company are the following men, prominent in the financial and commercial affairs of the city, and the amounts subscribed by each:

John Lloyd	.....	\$20,000
David F. Walker	.....	50,000
Benjamin M. Gunn	.....	10,000
J. Dalzell Brown	.....	25,000
Rufus P. Jennings	.....	10,000
W. J. Bartnett	.....	25,000
W. P. Plummer	.....	15,000
Marcel E. Cerf	.....	10,000

Ready to Take Bids

Plans for Oakland's new \$2,000,000 hotel have been practically completed by Architect Hardenberg of New York, who is now on the Coast and will remain until the construction work is well under way. Bids for the erection of the big hostelry are to be taken at once. The financial backers of the enterprise are a number of leading Oakland bankers. The hotel is to occupy the lot bounded by Harrison, Alice, Fourteenth and Fifteenth streets.

Berkeley's New City Hall

Nearly a dozen competitive plans have been offered by as many San Francisco and Oakland architects for the proposed new City Hall. Architect John Galen Howard has tendered his assistance to the town trustees in their task of selecting the best set of plans. Mr. Howard will give his services gratuitously.

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The temporary cessation of building operations in San Francisco has given the overworked architect and draughtsman a well earned breathing spell. To appreciate how badly they need a rest, one only has to consider the vast amount of work that has been turned out by them since the big fire. Employing from three to fifteen draughtsmen and working oftentimes ten and twelve hours a day for a solid year, it is no wonder the architect is glad to see a momentary let-up, for now he can break away from the office and enjoy a change of climate and environment without injury to his business. In his travels or musings he can gather fresh thoughts and new ideas which will help him and benefit the city when he returns to resume his labors. The present dullness is but temporary. It cannot be otherwise for San Francisco must be rebuilt. Another three months will find the city again plunged into a period of unprecedented building activity.

These are days when the advertiser is disposed to get "cold feet". It's the time of all times when he should use a little printer's ink. When times are good he argues that he don't need to advertise because he's got all the business he can attend to. When things get quiet he wants to economize and the first thing he does to cut expenses is to shut off his advertising. If he only could be taught to realize how fatal the mistake. To stop advertising when business is dull means to court failure. Therefore, if you are a quitter, don't advertise.

William Le Baron Jenney

The average American believes himself blessed by the accident of birth that made him such. The advantages are many but the cost is also great. He is expected to voluntarily contribute to many funds but is compelled to pay a high quota to very many others. For instance, the mere running expenses of a city like New York amounts to \$31 a head, Chicago comes next with \$13 a head, while Washington, Schenectady and such cities spend \$11 and from that on down to \$6. Then crime costs us enormously, the care of State and other prisons, the detection of crime and all that sort of thing eats up a total of over \$700,000,000 a year. But the most useless and inane of all our expenditures is that of fire, which is equivalent to a tax of nearly \$8 per head. Part of that goes to a gamble we make with the insurance companies to reimburse us for part of what we lose, but the greater amount is utterly wasted in smoke. Besides the loss of property entailed by fire there are yearly sacrificed nearly or over 6000 lives. Fully \$100,000,000 of the fire loss is of incendiary origin or the grossest criminal negligence. And these conditions are bound to obtain until our people have grown to be sensible enough to build better, more fireproof structures. No country on earth submits to the fire-tax that we do.

Architects' Law is Valid

Chief Justice Beatty of the State Supreme Court has denied the application of Edward C. McMannus for a writ of error to perfect an application for a writ of habeas corpus to the United States Supreme Court to test the validity of the law affecting architects. The law provides that all persons wishing to practice the profession shall submit to an examination before the State board, which McMannus refused to do. He was arrested and fined, and, to test the law, carried the case up to the Supreme Court. The decision rendered tends to sustain the law.

WILLIAM LeBARON JENNEY, one of the most widely-known of American architects, who won international fame as the originator of the plan of using steel framework in big buildings, died June 15th at his home in Los Angeles after a long illness. For many weeks only the amazing vitality of the man, the result of an active life, kept him alive. Despite the weakness incident to advanced age—he was in his seventy-fifth year—he kept up the determined but hopeless fight.

Mr. Jenney was a native of Fairhaven, Mass., the date of his birth being September 25, 1832. He was aged 17 when gold was discovered in California, and he joined the rush, making the voyage to the Golden Gate via Cape Horn in the ship Friendship, Capt. Stott. He did not make a success of mining, and returned to New York via the Hawaiian Islands, China and Manila, arriving home in 1851, having circled the globe. He took an engineering course at Harvard, and there mastered Spanish and French. Going to Paris he took a course in the Ecole Centrale des Arts, receiving a diploma, which, when the Civil War broke out, won for him a commission in the engineering corps of the Union army. Before the war ended he attained the rank of Chief of Engineers of the Fifth Army Corps.

In 1867 Mr. Jenney married Elizabeth H. Cobb of Cleveland, Ohio, and took his bride to Chicago. His opportunity came after the great fire. In the rebuilding of Chicago Mr. Jenney became a factor, and some of the largest buildings of that period were designed by him. His greatest work, and the one which made him internationally famous, was when, in 1884, he constructed the first steel-frame building along plans which were so perfect that they are universally followed to this day. His experiment was watched with interest by all prominent architects, many of them predicting failure, but the building which he erected for the Home Insurance Company still stands, and Mr. Jenney lived to see his plans adopted by builders all over the world. Mr. Jenney took a prominent part in the construction of the building of the Columbian Exposition in 1893, the Horticultural building being entirely planned by him.

In 1905 Mr. Jenney retired from active work and moved to Los Angeles. He was an honorary member of California Chapter, A. I. A.

The Publisher's Corner

△ Record Breaking Steel Contract

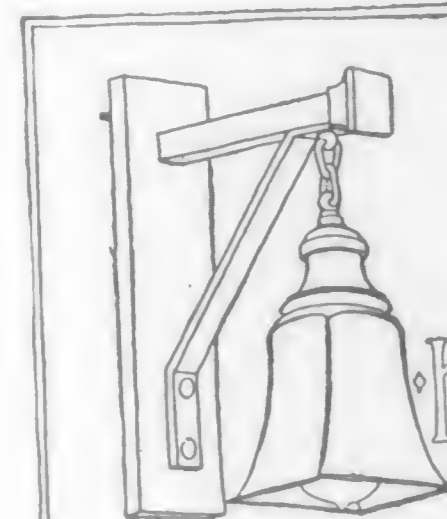
[See Illustrations Pages 76 and 78.]

The completion of the steel frame of the new Bank of Italy, at the corner of Clay and Montgomery streets, has been pronounced an achievement in speed construction without a parallel on the Pacific Coast. Just eighty-three days is the record made from the date the contract was signed till the last piece of steel was placed in position. To say that the bank officials were pleased is putting it mildly. The work was finished days sooner than they had anticipated.

Not only has the job been pronounced an exceptional one from the standpoint of speed, but it has been a marked success structurally speaking. While the

work was done quickly it was done well and there is no finer example of good steel construction in San Francisco today. The speedy completion of the steel frame is considered all the more remarkable in view of the strained conditions under which the work was carried on, coming at a time when labor was scarce and material high and hard to get.

The building is of the Class A type, 50 by 60 feet, and eight stories in height. The architect, Frank T. Shea, had his plans accepted in competition with eight or ten other architects. A feature of the building, structurally speaking, is the precaution taken to avoid possible damage from seismic disturbances and high winds. The columns and beams are both anchored to a nicety, and the rivet-



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ing has been done with the greatest care. The steel work was designed and detailed by W. W. Breite, an engineer of recognized ability, and very naturally Mr. Breite is elated by the successful consummation of his plans. The steel was fabricated by the Central Iron Works, of which A. A. Devoto is president. This company has come to the front rapidly since the fire and has received its full share of the big contracts. The erecting of the steel was done by C. A. Blume, the well-known contractor, and is a very creditable piece of work.

Praise for the Hamilton Grate

The following is from an address by Donald McDonald, delivered before the Ohio Gas, Light Association, on Gas Grates:

"Now we come to a third class of grates, known as the Hamilton Grate, one which supplies its own air for burning from out doors; which is charged with all the oxygen nature intended it to have, which is not the case with the air taken from the room which has been occupied. The air is not only taken from out doors to burn gas, (wood or coal) but there is also a large supply of fresh air (taken from out doors) to purify the products of combustion.

"Let me say, in conclusion, that it is the interest and the duty of every gas manager to inform himself and his customers about this most important matter; and to discourage in every way the use of gas for heat, in all cases where the ventilation has not been provided for with such care and intelligence as to insure his customers an atmosphere suitable for human beings to breathe.

"When the combustion is perfect it leaves no odor, smoke or so-called 'after damp' giving to the room a pure, wholesome, heated air.

"Gas heat is more convenient than any other heat. It is also cheaper and as agreeable as an open fire-place when such grates as the Hamilton or similar grates are used."

San Jose Contractors

Among the leading San Jose contractors who have done work for Architect Weeks are Florent Gardiser, Theo. F. Heple, R. O. Summers and the Garden City Electric Company. The Santa Clara Valley Mill and Lumber Company has done most of the mill work in San Jose and vicinity for Mr. Weeks, including the Vendome Hotel and the Dougherty house.

In New Quarters

The White Ornamental Iron Company, which has been turning out some exceptionally artistic work since the earthquake, announces the removal of its main office and works to De Fremery Wharf, foot of 5th avenue, East Oakland, which is within a few minutes' ride via the Southern Pacific Broad Gauge train to Clinton Station, or via the Eighth street car, leaving Broadway, Oakland, every ten minutes.

The new ornamental iron shop is 100 by 150 feet, and supplied with the most modern equipment. A complete force of skilled workmen is employed. The company also has an electro plating plant, fully equipped for handling architectural and ornamental iron work of all descriptions; also, an up-to-date pattern shop. In another sixty days the company will have a new and complete foundry for high grade ornamental castings in iron, brass and bronze.

Mr. White assures his patrons that all inquiries and orders will receive prompt and careful attention, as heretofore, and a representative will call, upon telephonic request. The company's San Francisco office is 499 Monadnock Building.

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including the Vendome Hotel and the Dougherty house.

Gilhuly & Ambler Busy

Notwithstanding the unsettled building conditions the firm of Gilhuly & Ambler, with offices in the Atlas building, has no cause to complain of business depression. The firm, as Pacific Coast agents for structural steel manufacturers in the East, has lately taken several good-size orders. It will supply the steel for the Pioneer building, a seven-story Class A structure to be erected by the Lindgren-Hicks Company; also the steel for the Marvin building, a seven-story Class A structure designed by Architect Meusdorffer.

Gilhuly & Ambler also represent the Buffalo Steel Company in the sale of twisted high carbon steel bars and spiral high carbon steel bars for concrete reinforcing. The firm is prepared to handle the business very promptly and supply bars cut to the exact length required.

Series of Circulars

Keuffel & Esser Co., 127 Fulton and 42 Ann street, New York, and 40 Oak street, San Francisco, the well-known manufacturers and importers of drawing materials, mathematical and surveying instruments and measuring tapes, have recently distributed a series of circulars regarding their automatic print hangers for the print room; their folding rules of hardwood, steel and ivory, and of Sperry's Pocket Calculator, which combines the range and accuracy of the straight slide rule with the portability and compactness of the pocket calculator.

Leads All Other Cities


The reconstruction of San Francisco, where so much concrete construction has been specified, makes that city easily the leader in concrete work. Another dry dock in San Francisco harbor has recently been contracted for which will cost \$1,250,000.00 and will be the largest in the world. Concrete brick and concrete veneering blocks have become popular in the construction of residences, where lath and steady walls are to be veneered on the outside. It is one of the handiest ways of using cement building material and some beautiful effects have been obtained. It is also said in some cases to be quite as economical as sheeting and clapboards.—Rock Products.

Something New in Furnaces

The Pacific Heating and Ventilating Company announces that it is prepared to assist architects in preparing plans for heating and ventilating any kind of building from school house to office

building. The company has in its employ competent engineers who will contribute their services, either to architects or owners, without expense, and will supply complete working plans for the most approved heating and ventilating systems. The company just now is making a specialty of school-house work, and guarantees to equip a building in a manner entirely satisfactory.

The company has the exclusive handling of something comparatively new in the furnace-heating line and it bids fair to revolutionize things. It is a gas furnace—not a gas grate or gas stove, but a gas furnace, capable of heating any size building in less time and at no greater expense than a coal or wood furnace. No chimney is required. There is no dirt about it, nor is there any unpleasant odor. Strike a match, turn a valve and it's ready. No ashes to carry or coal to handle. The gas heater would seem to satisfactorily solve the heating question for homes, offices, stores and churches. The furnace is already being successfully operated in a number of San Francisco buildings, a list of which, together with other information, price list, etc., will be mailed upon application. The company's office is at 3267 Seventeenth street, San Francisco.



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The Webster Dictionary

The G. & C. Merriam Company of Springfield, Mass., have recently issued a new and enlarged edition of Webster's International Dictionary. It is printed from new plates throughout and contains a supplement of 25,000 additional words, a completely revised Gazetteer of the World, and a completely revised Biographical Dictionary, etc. The book is commended by leading statesmen and scholars and has been the standard in spelling and pronunciation in the government printing office for years. It is a book worth having.

Brick for San Francisco.

The Simons Brick Company of Los Angeles is filling an order for a cargo of common brick to be used in the reconstruction of San Francisco. The vessel is being loaded at San Pedro. The company has also an order from the Alphonso Custodios Chimney Construction Company of San Francisco for 3800 tons of clay blocks. These shipments are the first on record between the two points.

Walter Henderson Busy

Steel contractor Walter Henderson cannot complain of business conditions. Besides quite a little small work he has

just taken the contract for erecting the steel on the new Regan building at Powell and O'Farrell streets, San Francisco. This is to be a four-story Class A building, planned by Architects Welsh and Carey. Mr. Henderson is nearly done with the erection of the steel frame for the seven-story Hotel Rex on Turk street.

Hotel at Congress Springs

The Southern Pacific Company has purchased the Louis A. Sage property at Congress Springs, near Saratoga, Santa Clara county, and will at once begin the erection of a fine hotel and outbuildings, involving an expenditure of \$200,000. The Inter-Urban track already runs to Congress Springs and it is understood to be the purpose of the company to run its Santa Cruz short line through Saratoga so that picnic excursions may be run to the Springs from San Francisco and other points. A feature of the new buildings will be an immense bath-house.

A. W. Spalding and Max Umbrecht have associated under the firm name of Spalding & Umbrecht for the practice of architecture. Their present offices are at 422-423 Globe block, Seattle.



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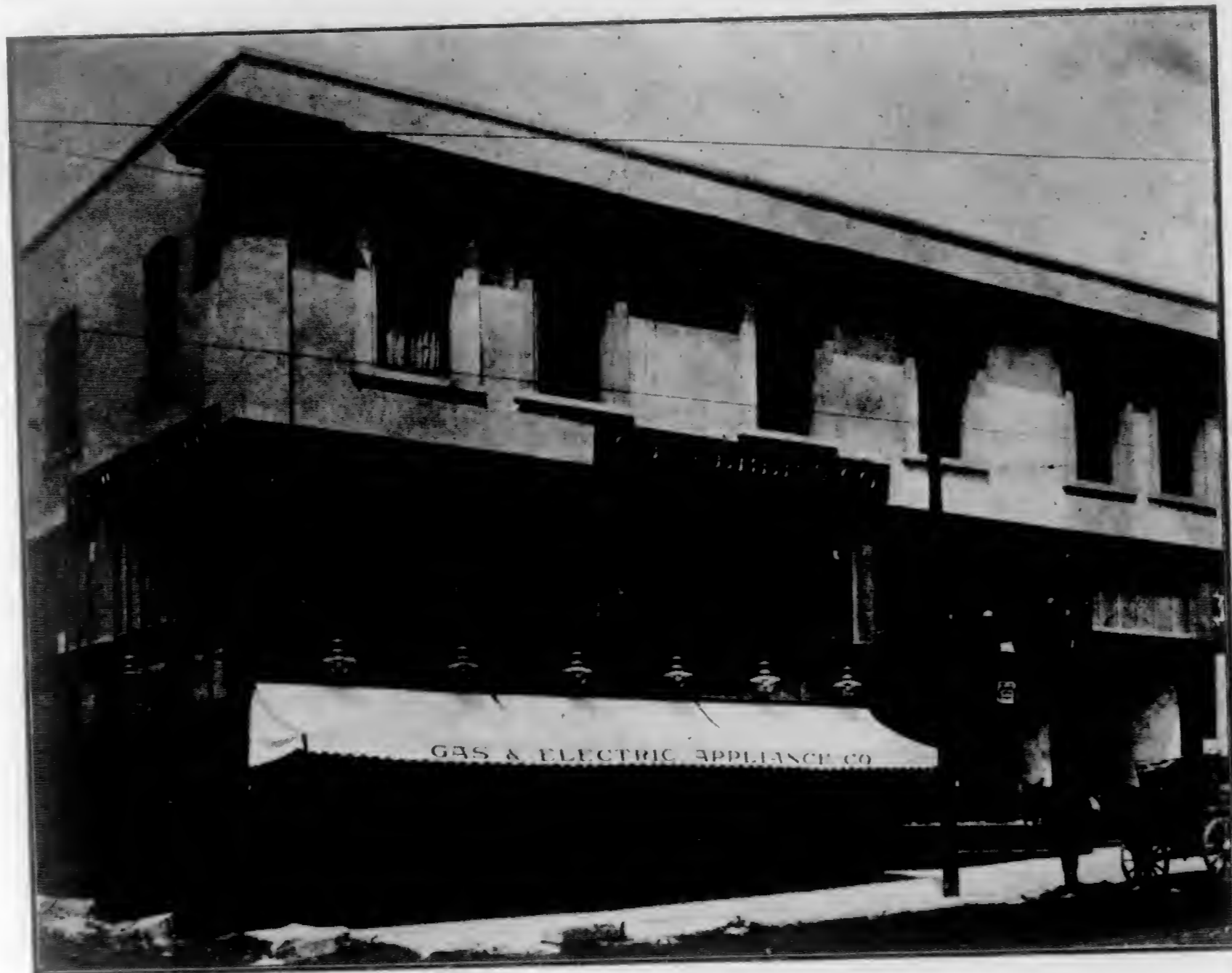
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C. F. Weber & Co's. New Home. (San Francisco)


Schastey & Vollmer's New Studio

Although but one year in San Francisco, the firm of Schastey & Vollmer has experienced remarkable success. Having outgrown its modest quarters in the Monadnock building, the firm has moved to 1930 Van Ness avenue, where excellent warehouse facilities have been provided in addition to increased studio accommodations. Abundant light is a feature of the pretty salesroom, which has been charmingly fitted up in the very latest tapestries, rugs, etc. The firm makes a specialty of interior decorating,

and since coming to the Coast from New York has fitted up some of the best homes in San Francisco and vicinity. Some photographs of interiors done by Schastey & Vollmer will be shown in this magazine in the near future.

Fireproof Building

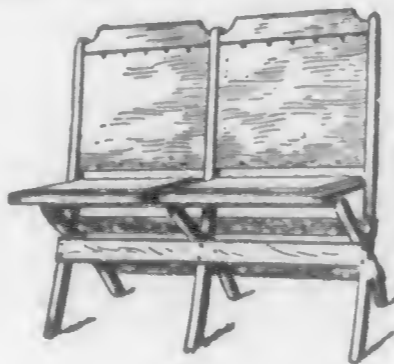
A fireproof building for the storing of valuable astronomical photographs has been ordered built at Lick Observatory, Mount Hamilton. The structure will probably be of reinforced concrete and will cost \$10,000.



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Some of the big warehouses which have been rebuilt since the San Francisco fire have taken unusual precaution from fire by installing not only complete sprinkler systems but private fire departments. The employes have been drilled to use both chemical engines and hose-wagons. Paul Brant of No. 9 Mission street is coast representative for the Stempel chemical wagon which can be drawn by hand and contains a chemical tank with sufficient fluid to extinguish a good size blaze. Mr. Brant also sells the Stempel Gold Medal and Aaron hand extinguishers. Large size chemical engines, hose-carts and hook and ladder trucks are also turned out by Mr. Brant's company, and a number of these wagons are in use in various cities and towns on the coast.

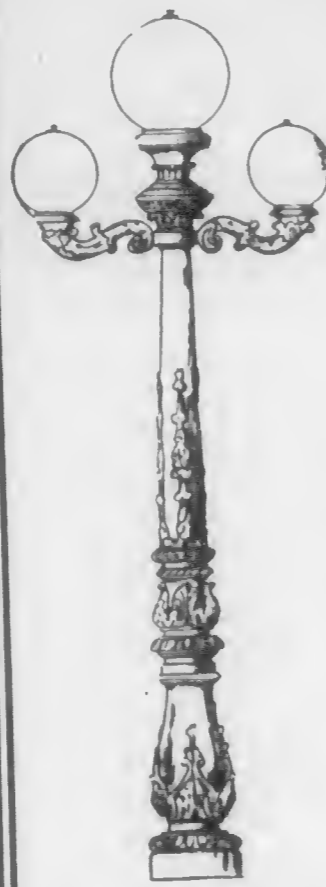
Royal Heating Co.

This firm is now located in their own building on Fourth street, between Harrison and Perry streets, San Francisco, where they carry a large and complete line of heating appliances, consisting of the celebrated royal steam and hot-water heaters and hot-air furnaces and a full line of registers; both of the well-known Foster Wall and Tuttle & Bailey floor patterns, radiators, radiator valves, air valves, floor and ceiling plates, asbestos pipe covering and paper, etc.

Locating here some eight years ago and beginning in a small way they have had a phenomenal growth, brought about by prompt and close attention to the wants of their customers and doing the best work in all their lines that it is possible to do. They are agents for the Van Auken System of Vacuum heating, which is now being installed in some of the best buildings in San Francisco, Berkeley and Oakland. They do all kinds of heating and ventilating, using steam, hot water, hot air, or combination systems, making a specialty of heating and ventilating schools, hospitals, churches, or residences where blowers are used in connection with hot-air heaters.

They furnish lay-outs of work and make plans and specifications for any and all kinds of heating and ventilating plants.

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180 Second Street, San Francisco

Did Work for Architect Weeks

Chivers Bros. of Pacific Grove have done quite a little work in that section for Architect Weeks. Among the buildings erected by this firm are the post office building in Pacific Grove, the Prussia residence building for Mrs. C. A. Rowe, and the Roderick block.

Contractor H. D. Koch built the E. C. Smith bank at Pacific Grove and the Goldstein building in Monterey. Mr. Koch has the reputation of doing first-class work. With the completion of the Goldstein building he will remove to Berkeley, where he has a number of jobs on hand. His present address is 812 Delaware street, Berkeley.

The Globe Electrical Company of Monterey has wired nearly all Mr. Weeks' buildings in Monterey county. The list includes several fine residences, the Goldstein building, the Work Theater, the E. C. Smith bank, the Roderick building and the Hazel Hawkins hospital.

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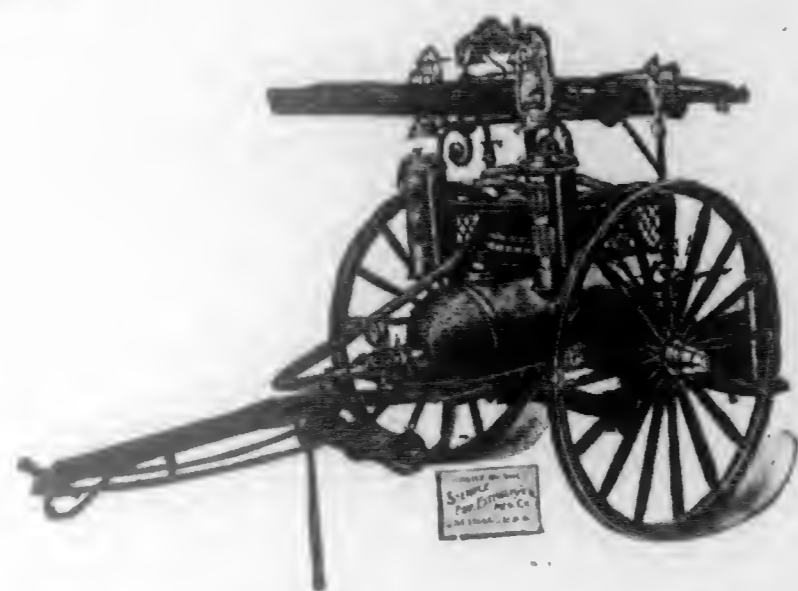
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Some of the big warehouses which have been rebuilt since the San Francisco fire have taken unusual precaution from fire by installing not only complete sprinkler systems but private fire departments. The employes have been drilled to use both chemical engines and hose-wagons. Paul Brant of No. 9 Mission street is coast representative for the Stempel chemical wagon which can be drawn by hand and contains a chemical tank with sufficient fluid to extinguish a good size blaze. Mr. Brant also sells the Stempel Gold Medal and Aaron hand extinguishers. Large size chemical engines, hose-carts and hook and ladder trucks are also turned out by Mr. Brant's company, and a number of these wagons are in use in various cities and towns on the coast.

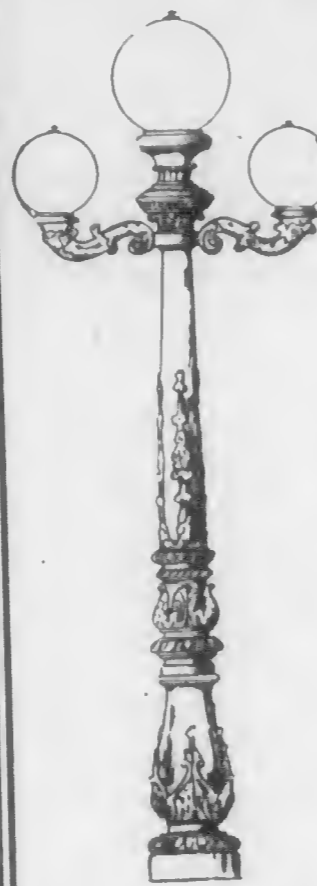
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Did Work for Architect Weeks

Chivers Bros. of Pacific Grove have done quite a little work in that section for Architect Weeks. Among the buildings erected by this firm are the post office building in Pacific Grove, the Prussia residence building for Mrs. C. A. Rowe, and the Roderick block.

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and Smith bank in Pacific Grove. The firm makes a specialty of reinforced concrete construction.

Cooley and Giles, painters and paper hangers, at Hollister, have made for themselves an enviable reputation as interior decorators of residences and country bungalows. Some of the prettiest homes in the vicinity of Hollister were painted by this firm, including the handsome Dunn residence, Dr. Tibbett's home, the court house at Hollister and the Hazel Hawkins hospital.

Whitcomb and Fenton are well-known Salinas contractors. The former has been in the contracting business nearly a quarter century. Among the buildings erected in Salinas by this firm are the Archer block, First National Bank, George White building, Weideman block at Gonzales, and alterations to the Salinas City high school.

One of the best-known firms in Salinas are Anderson & Dougherty, plumbers and tanners at 261 Main street. This concern has done the plumbing in practically all the big buildings erected in that city the past few years. Their work in every instance has given satisfaction. The buildings which they have equipped with plumbing fixtures are the Monterey County jail, the Spreckels Sugar Company's office and hotel, forty cottages of

the Spreckels Sugar Company, Elks' hall, Salinas City high school, Salinas opera house, parochial school, Masonic hall, armory, Odd Fellows' hall, and the Jos. Bardin hospital.

In connection with the building of the new Casino and bath house at Santa Cruz considerable praise is due F. R. Cummings, superintendent of construction, and W. J. Keating, general superintendent, both of whom worked indefatigably to insure the successful completion of the buildings in time for the opening of the summer season. The buildings are all well constructed and are a credit to the architect and builders.

The outside cementing of the pavilion was done by Van Wagner Bros., while the concrete work for the big plunge was done by Lease Bros. Both jobs have caused very favorable comment. J. E. Manetta did the staff and stucco work, which are a feature of the exterior decorations.

F. A. Hihn Company

The F. A. Hihn Company controls four large lumber yards which supply much of the trade in Santa Cruz, Watsonville, Salinas and Hollister. The company maintains planing mills at Santa Cruz, Watsonville and Hollister, and has saw-

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mills at Laurel and Boulder Creek, in addition to two large shingle mills. The special Star redwood shingle, specified by Architect Weeks in all his work, is manufactured by the Hihn Company. The shingle mills are at Laurel and Watsonville. The two planing mills have a capacity of 100,000 feet a day, and the shingle plants will turn out the same number of shingles daily.

Among the leading San Jose contractors who have done work for Architect Weeks are Florent Gardiser, Theo. F. Heple, R. O. Summers and the Garden City Electric Company.

Loma Prieta Planing Mill

The Loma Prieta Planing Mill at Watsonville is one of the largest in Santa Cruz county. The company has been

doing business in Watsonville nine years and employs a force of from 50 to 75 men. Its present plant was enlarged about four years ago and a year ago one of the largest dry kilns on the Coast was installed at considerable expense. The kiln has a capacity of 60,000 feet a day. The company aims to do all kinds of mill work in first-class manner, and particular attention is paid to fitting up dry goods stores and offices. Tanks, sash and doors, etc., are also given attention. W. H. Ames is mill superintendent and handles all architects' plans that are sent in for estimates. The company holds a membership card in the San Francisco Builders' Exchange. Its officers are: President, Timothy Hopkins; treasurer, N. T. Smith; vice-president, A. C. Bassett; secretary, A. Williams.

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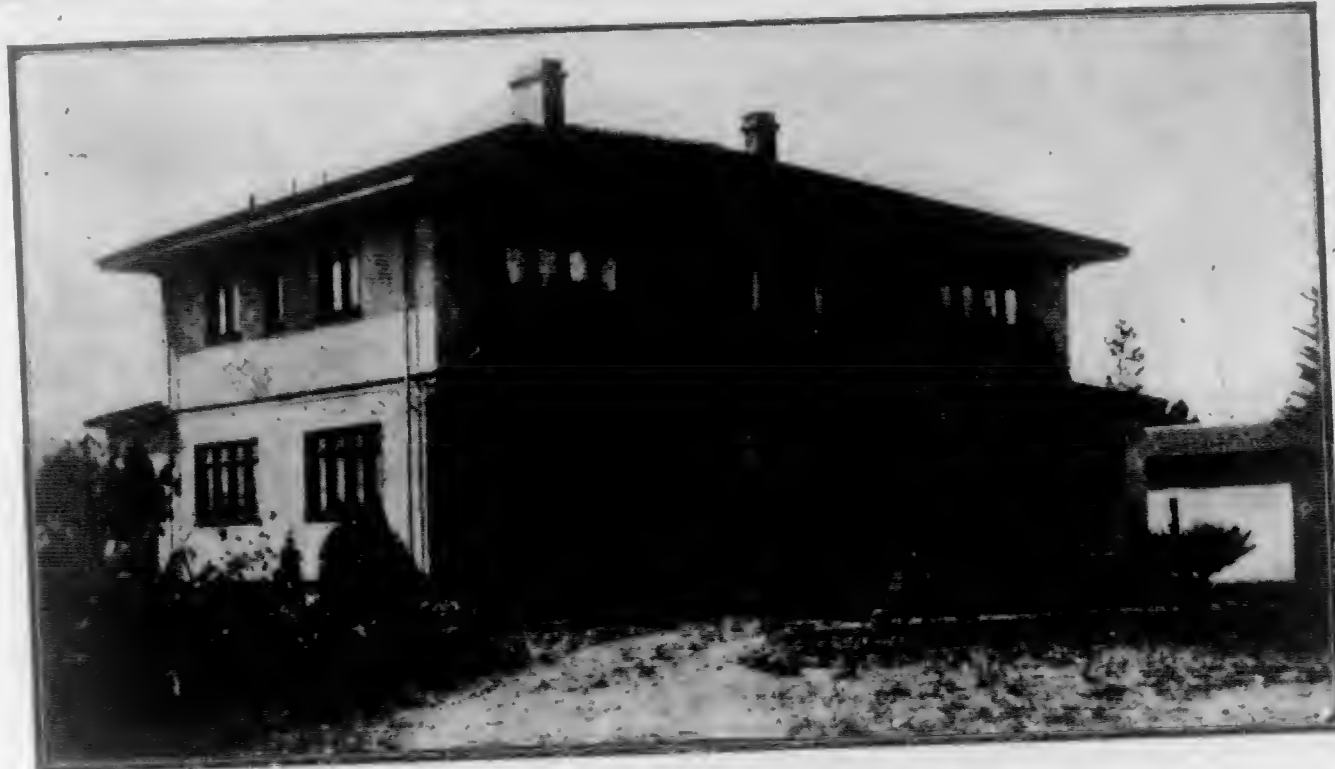
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Will Use Terra Cotta

The Sonoma County Board of Supervisors have determined to have a terra cotta finish for the new courthouse to be constructed at Santa Rosa. In their call for bids on the building they specified the finish must be either cement or terra cotta. The bids showing a difference of \$75,000 in the two finishes, and the board adjourned from last Saturday until yesterday to determine which finish they would accept. Many of their constituents urged the acceptance of the terra cotta finish, and the board preferred that finish also. The contract was awarded to the Rickon-Ehrhart Engineering and Construction Company of San Francisco, and work on the mammoth foundations will be begun at once.

The firm of Hebbard & Gill, architects, has been dissolved. The business is now carried on by Will Sterling Hebbard, whose address is the Grant building, San Diego.

In a very tasty announcement, the firm of Crim & Scott, architects, announce their removal to 425 Kearny street, San Francisco.

Oakland Notes

The Pacific Coast Lumber Company is to spend \$17,000 in the erection of a new planing mill south of the Western Pacific line, between Eighth and Ninth avenue, East Oakland.

The Society of the Seventh Day Adventists is to build a new church at Twenty-fifth street to cost \$11,000. Folding chairs are to be purchased.

— TELEPHONE, MAIN 321 —

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Charles William Dickey, Architect

Frontispiece, *The Architect and Engineer*
of California, July, '07

THE
Architect and Engineer
Of California

VOL. IX.

JULY, 1907.

No. 3.

The Work of Charles William Dickey, Architect



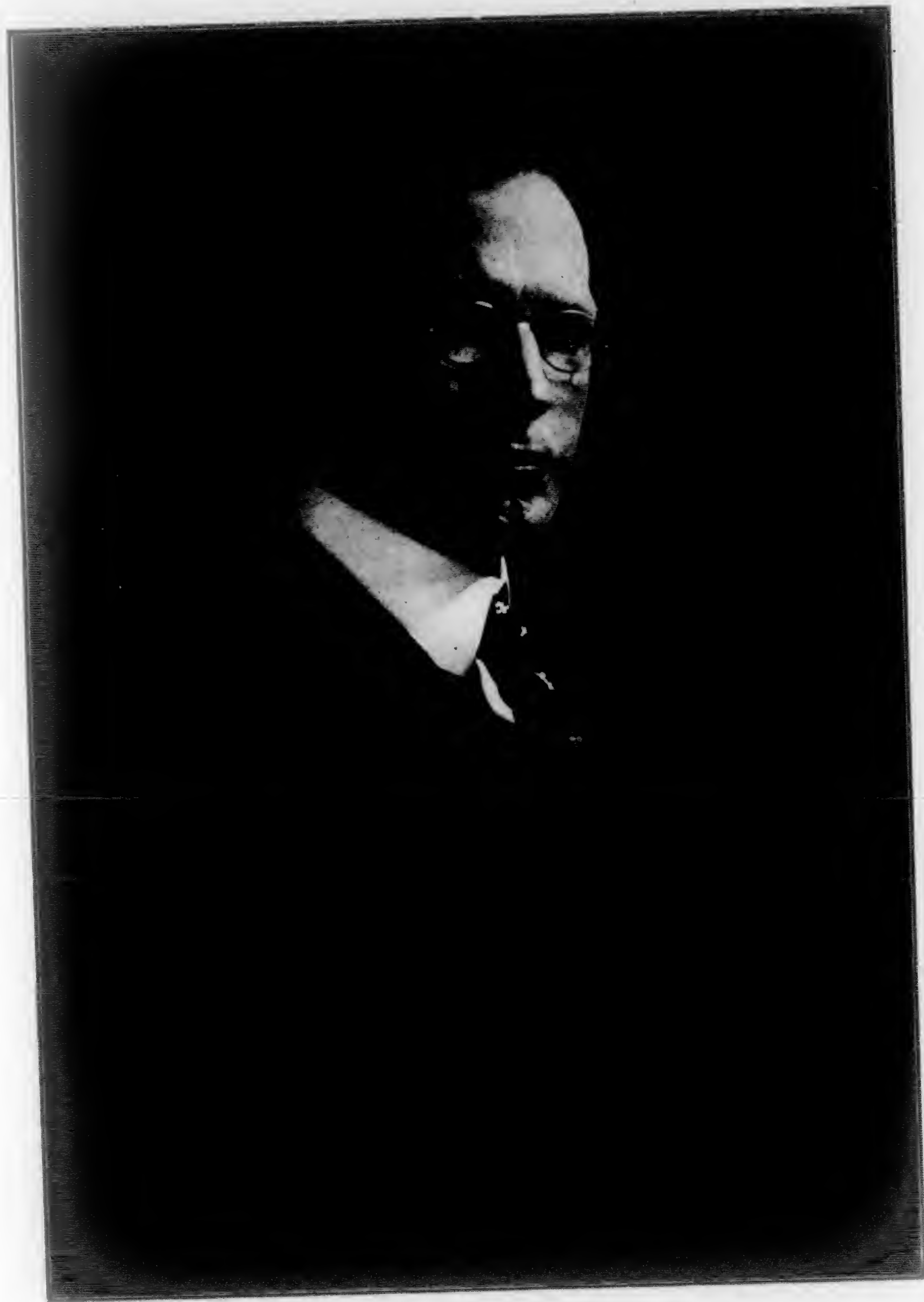
CHARLES WILLIAM DICKEY, whose architectural work is published herewith, was born in Alameda, California, in July, 1871, but his early life was spent in the Hawaiian Islands. He is a son of Senator Charles Henry Dickey, of Honolulu, T. H. His studies were pursued at the Oakland High School and in 1890 he entered the Architectural Department of the Massachusetts Institute of Technology, in Boston, Mass., from which institution he was graduated in 1894.

After working a short time in the architectural offices of H. C. Koek & Company, of Milwaukee, and Reid Bros., of San Francisco, he returned to his island home to begin his architectural career as a member of the firm of Ripley & Dickey, Honolulu.

He was at once confronted with the difficult problem of adapting modern architectural forms to tropical conditions. The task of solving this problem brought out his imagination and originality and had a great deal to do with his future development. That he caught the spirit of his environment and truthfully portrayed this spirit in all his Hawaiian work will be clearly seen by reference to the pictures here published. His simple and artistic houses with their broad lanais (porches), projecting eaves, low pitched roofs and other features fairly breathe the atmosphere of Honolulu, the Paradise of the Pacific. He has left his stamp upon the architecture of the Islands and has done more than any other man to raise it to its present high standard.

In 1903 the financial depression in Honolulu led him to try his fortunes elsewhere and he opened an office in Oakland, California, under the firm name of Dickey & Reed. Mr. Reed later withdrew from the firm to pursue his architectural studies at the Massachusetts Institute of Technology.

Mr. Dickey's success in Oakland has been phenomenal and he is now generally recognized as one of the leading architects of the city. His most notable buildings are the Claremont Hotel and the Oakland Bank of Savings. All



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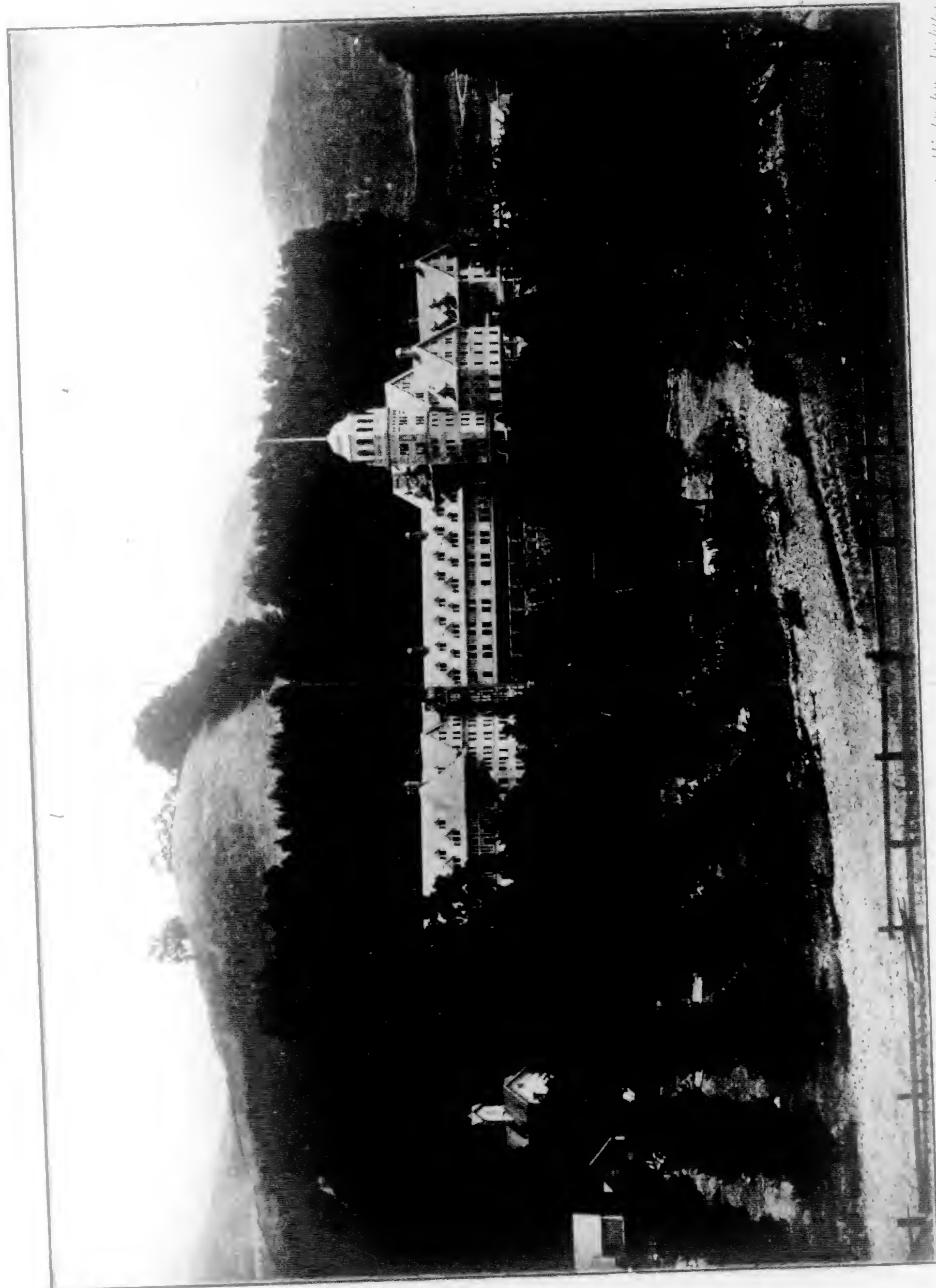
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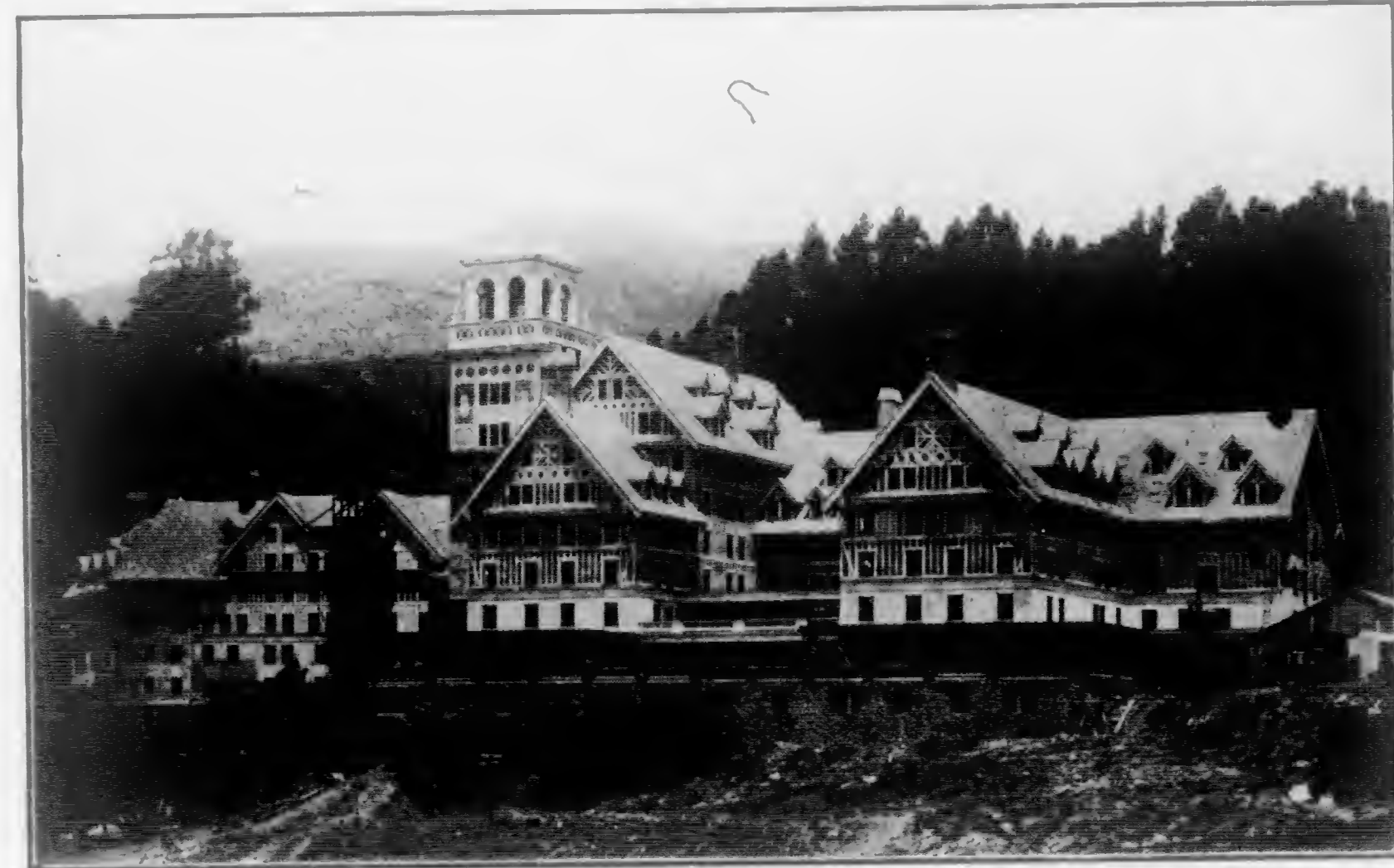
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C. W. Dickey, Architect

Claremont Hotel, Berkeley

Bank of Savings, Berkeley



Front View of the Claremont Hotel, Berkeley C. W. Dickey, Architect

of his work bears his personal stamp showing originality and imagination controlled by a thoroughly trained mind. Each of the buildings he has designed clearly expresses the purpose for which it is intended, and is in perfect harmony with its environment. These two points are absolutely essential to any successful architectural composition and they are never lost sight of in any of his work.

The Claremont Hotel is probably his greatest achievement. He won his appointment as architect for this great tourist hotel in competition with some of the leading architects of the Pacific Coast. The manner in which he has grasped the subject and taken advantage of every feature of the beautiful site is really remarkable. The building appears to grow out of the earth and conforms to all the undulations of the ground and the sweep of the hills. The picturesque Elizabethan style which he has adopted is most suitable to fulfill all the conditions. The hotel looks inviting and home-like and will doubtless prove one of the most successful tourist hotels of the Pacific Coast.

The Oakland Bank of Savings building is a very pure piece of classic design and represents all that is best and purest in commercial architecture. The construction and finish of this building rank it with the finest of its kind in the United States, and it will be as nearly earthquake and fire-proof as the achievement of modern skill and science will permit.

Space will not permit the description of many of the buildings here depicted, but the California State building, at the Lewis & Clark Exposition, should be mentioned as being especially interesting to Californians. In this building are cleverly combined the perfect reproductions of the fronts of four historic California missions and the dome of a fifth. In planning these reproductions, Mr. Dickey was fortunate in securing some very fine photographs of these mission buildings taken in the early sixties, before they had been remodeled and restored, and hence the State building at Portland possessed special historic interest.

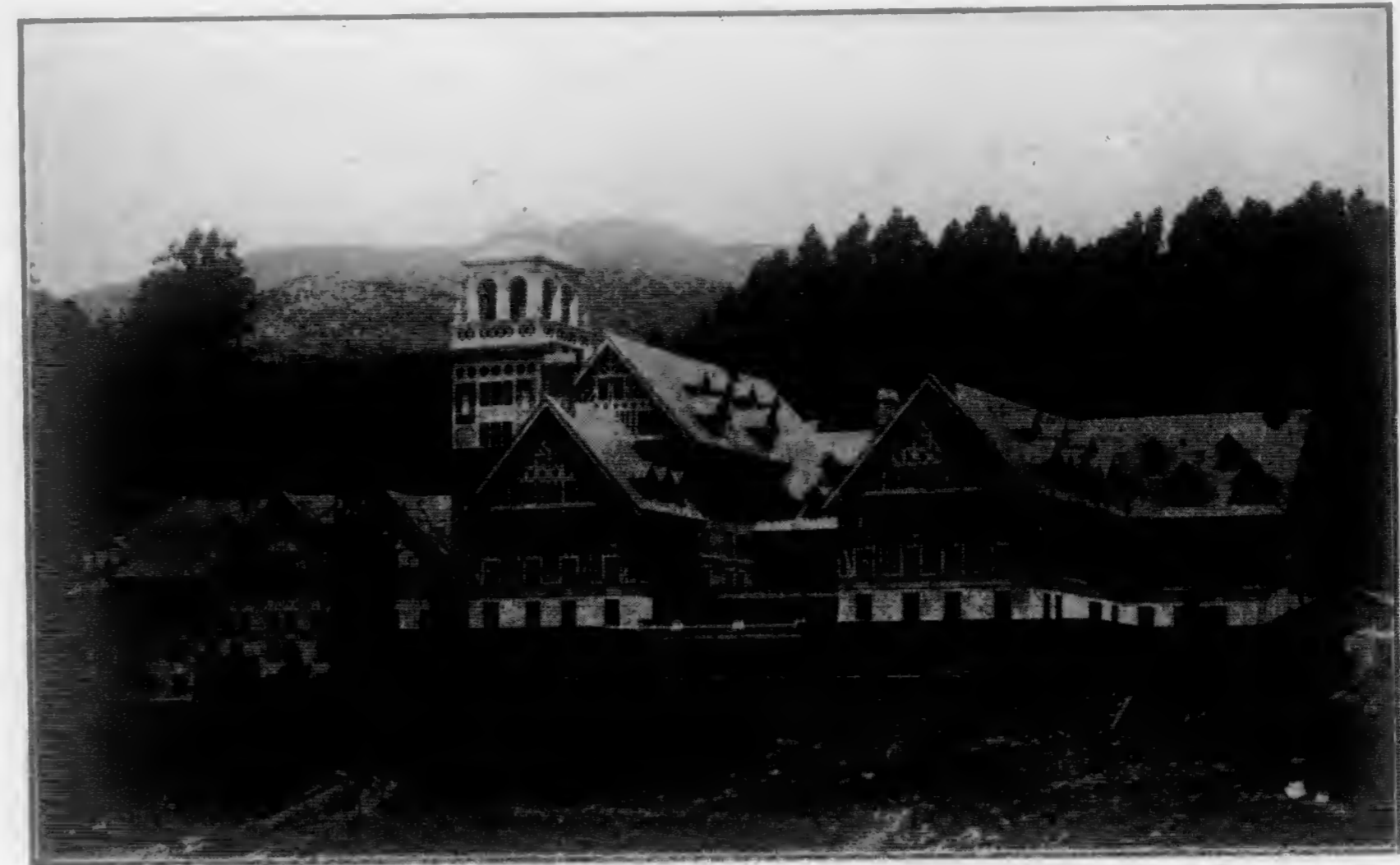
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Claremont Hotel, Berkeley

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Looking Towards the Claremont Hotel, Berkeley, from one of the Driveways
C. W. Dickey, Architect



Equipped with Otis Elevators Oakland Bank of Savings Building C. W. Dickey, Architect



Morse Apartment House and Post Office, Berkeley C. W. Dickey, Architect



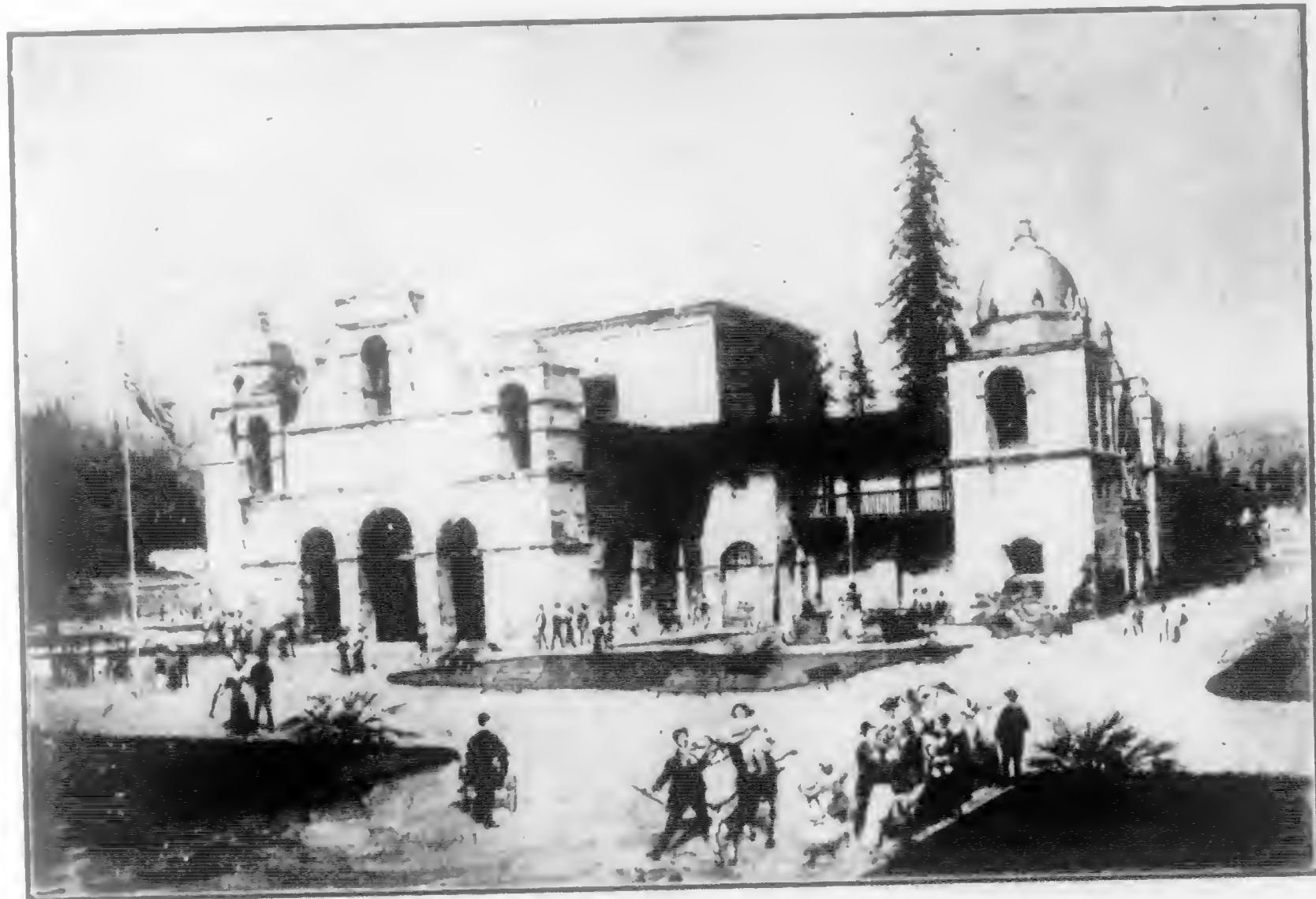
Looking Towards the Claremont Hotel Berkeley from one of the Driveways
C. W. Dickey, Architect



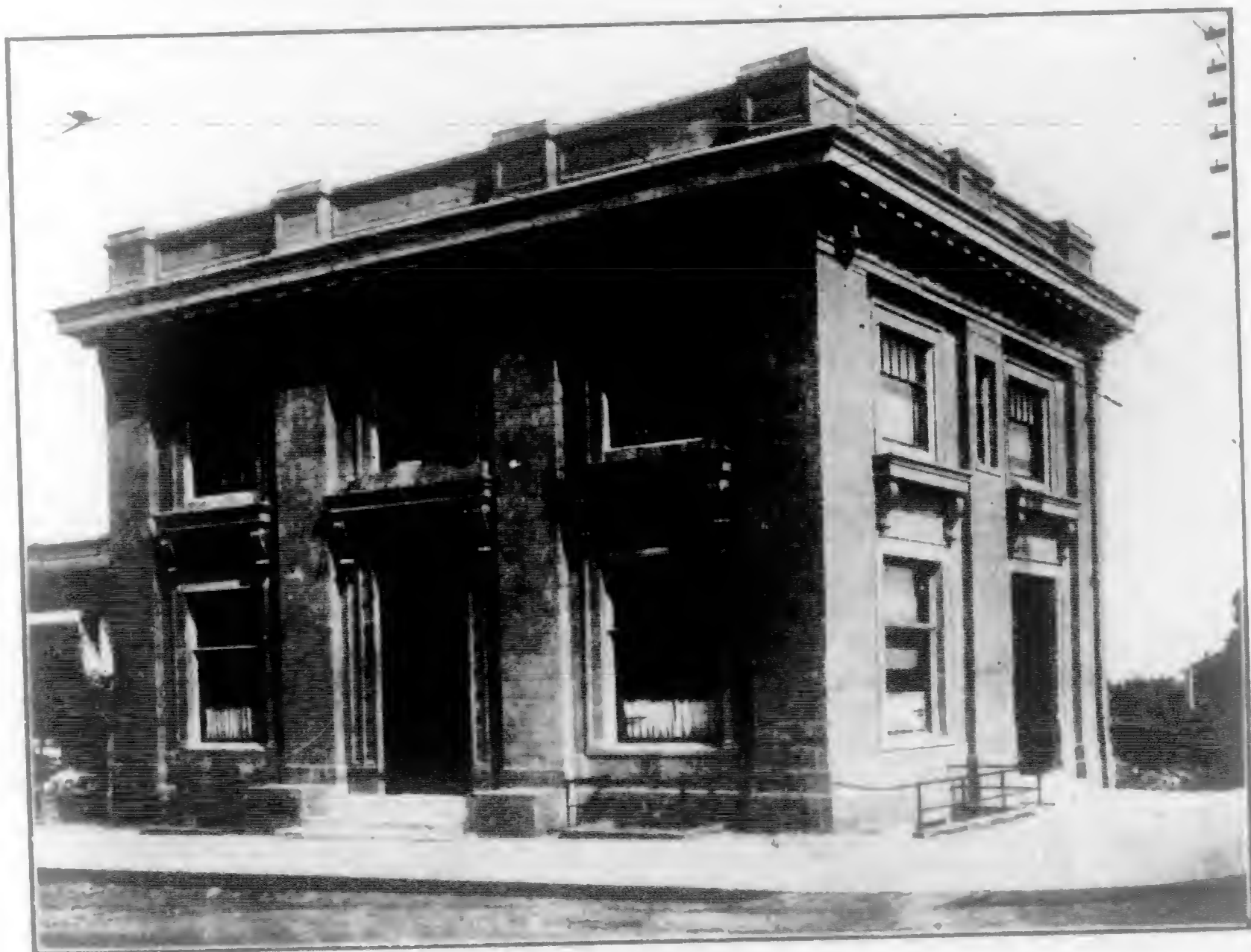
Equipped with Otis Elevators Oakland Bank of Savings Building C. W. Dickey, Architect



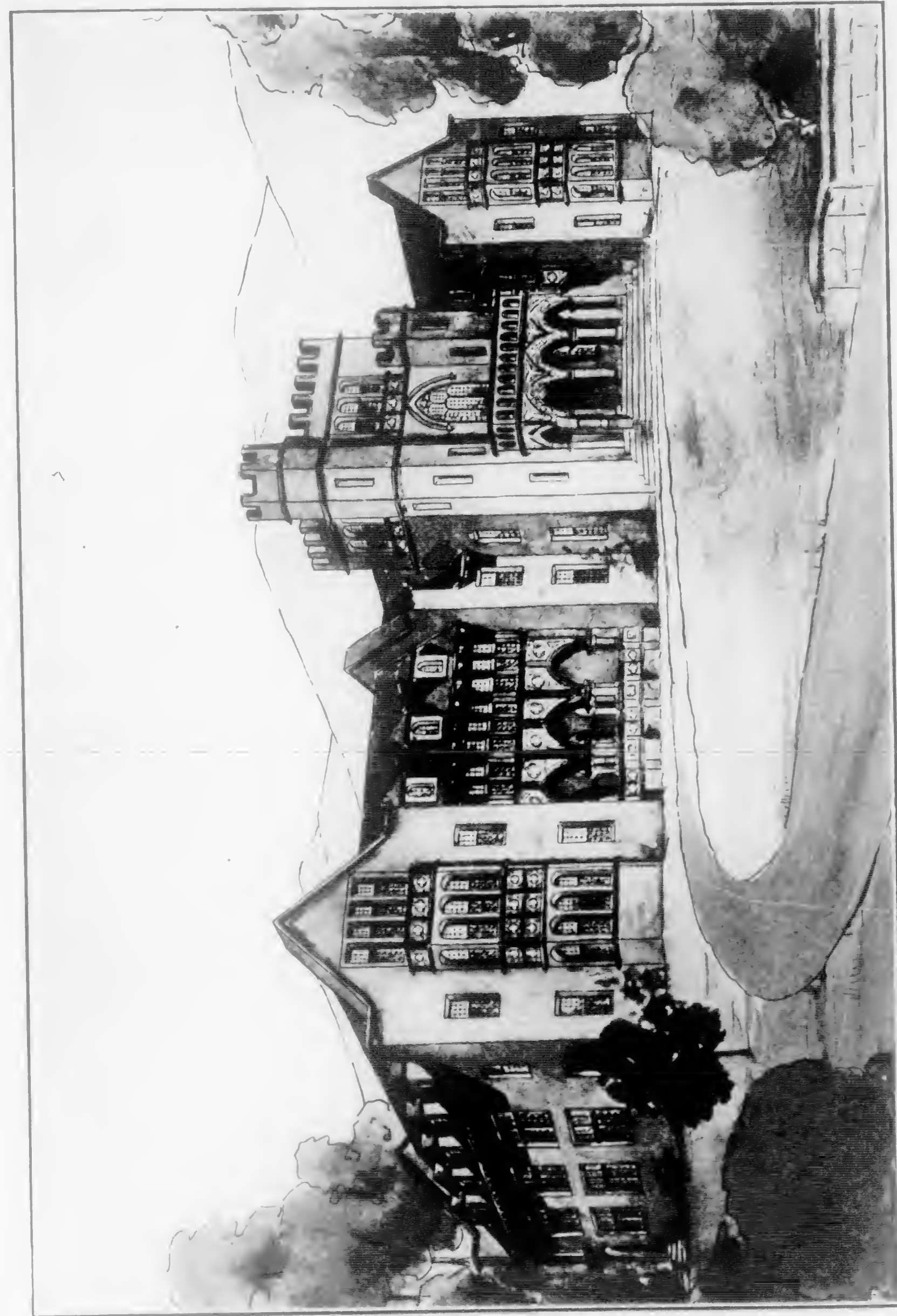
Morse Apartment House and Post Office Berkeley C. W. Dickey, Architect



California State Building at Lewis and Clark Exposition
C. W. Dickey, Architect



West Berkeley Bank
C. W. Dickey, Architect



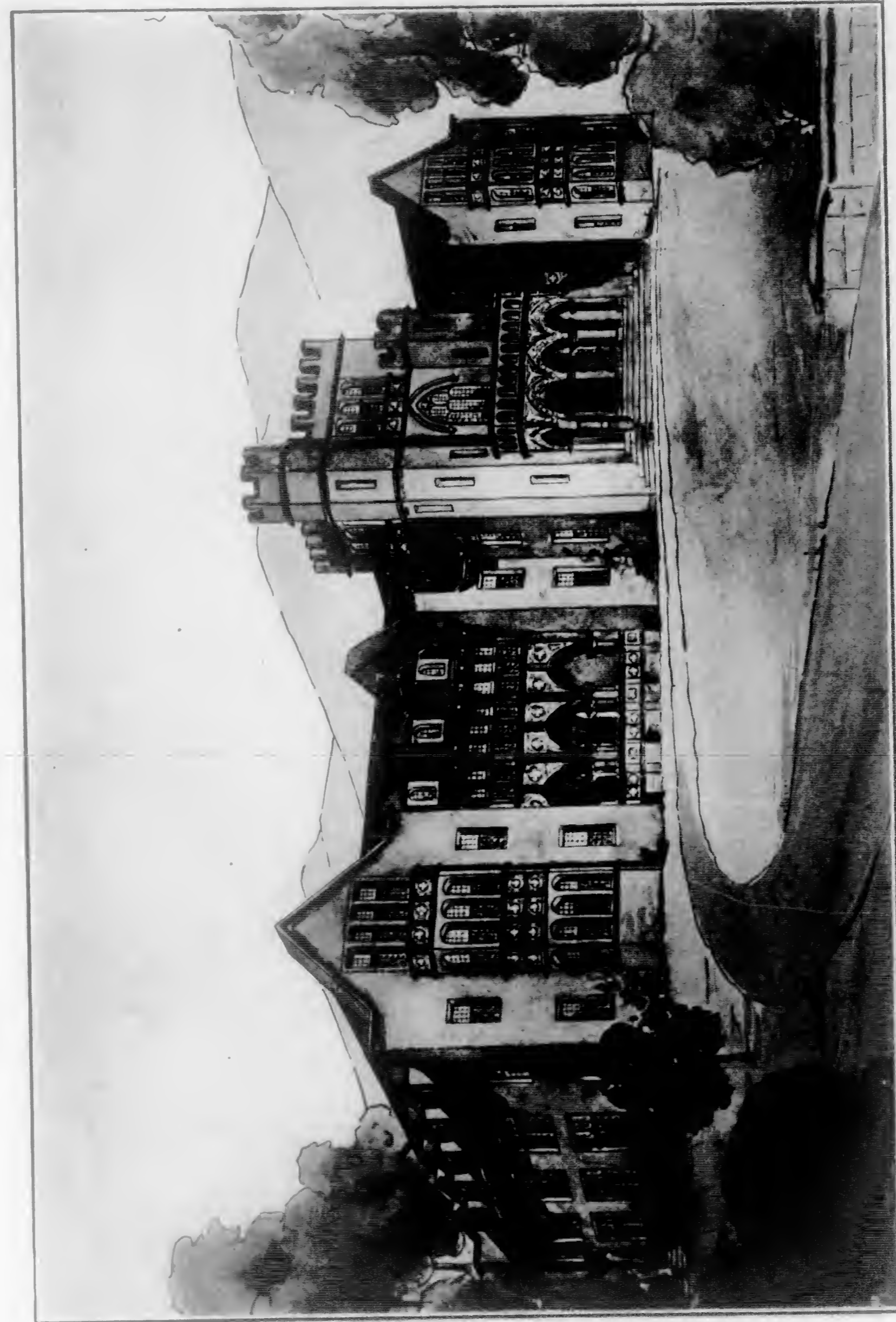
Sketch for Escondido School C. W. Dickey, Architect



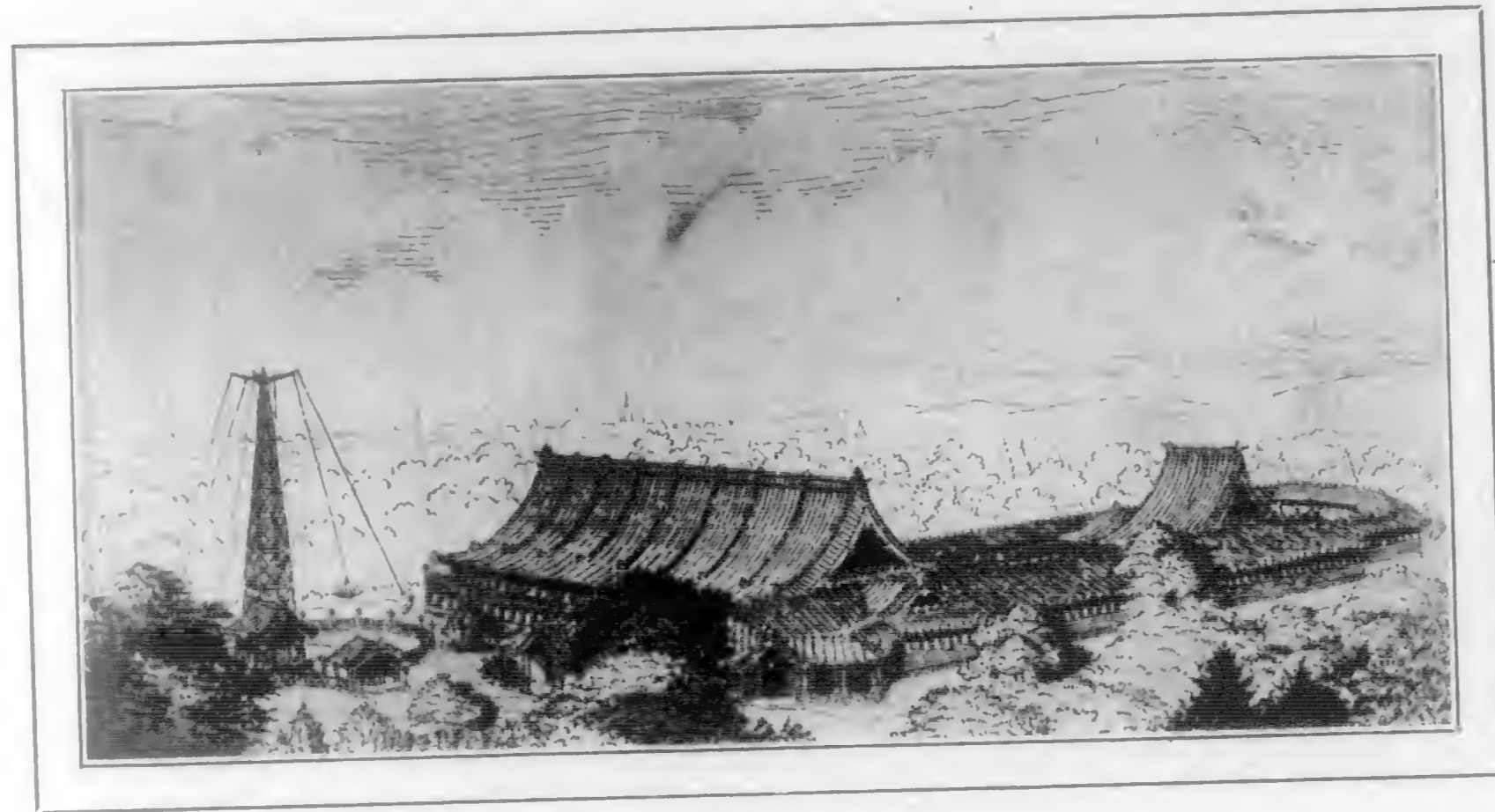
California State Building at Lewis and Clark Exposition
C. W. Dickey, Architect



West Berkeley Bank
C. W. Dickey, Architect



Sketch for a Boarding School — C. W. Dickey, Architect



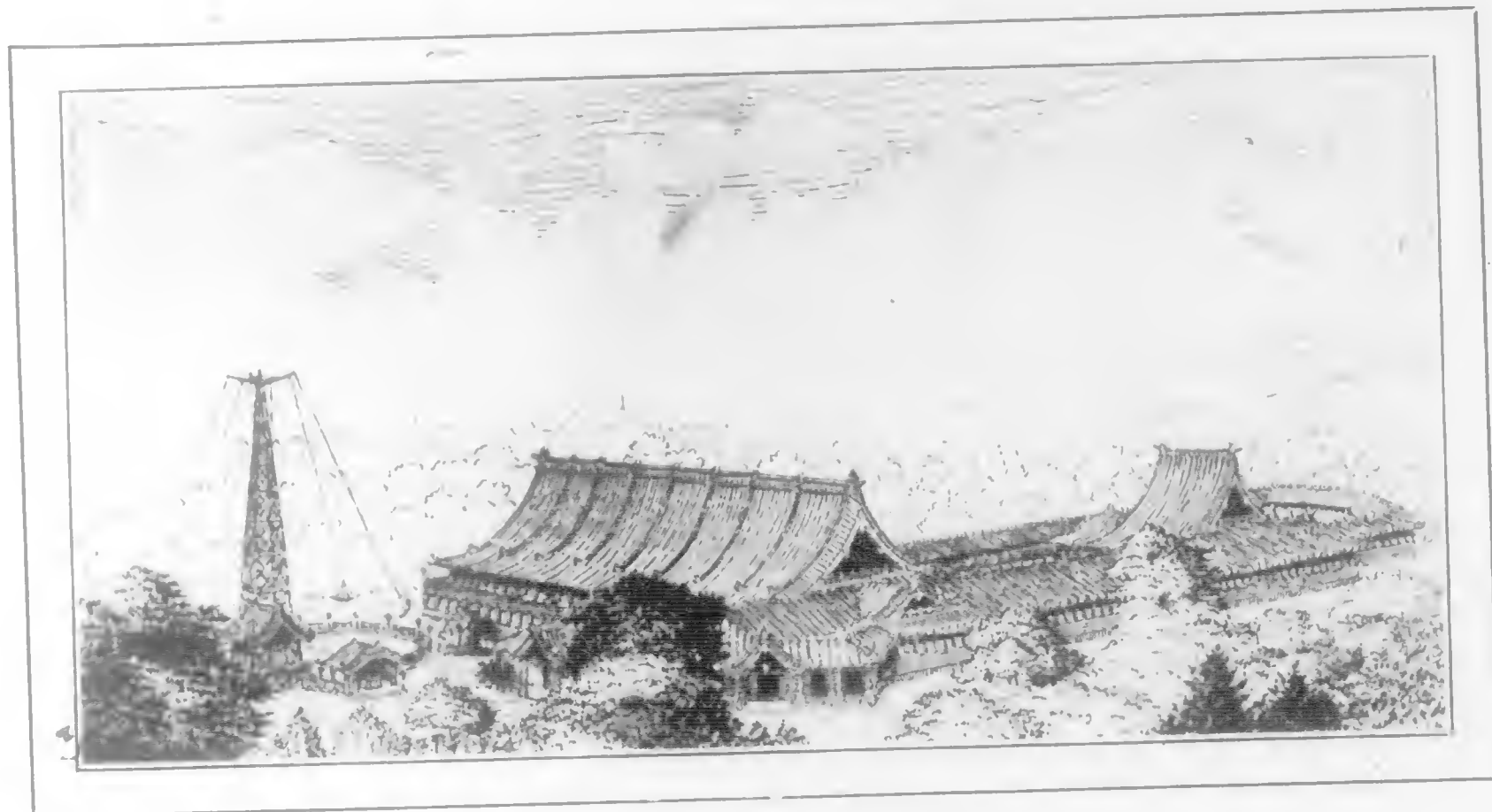
*Bird's-Eye View of Idora Park Skating Rink, Oakland
C. W. Dickey, Architect*



Entrance Idora Park Skating Rink



Market Street School, Oakland — C. W. Dickey, Architect

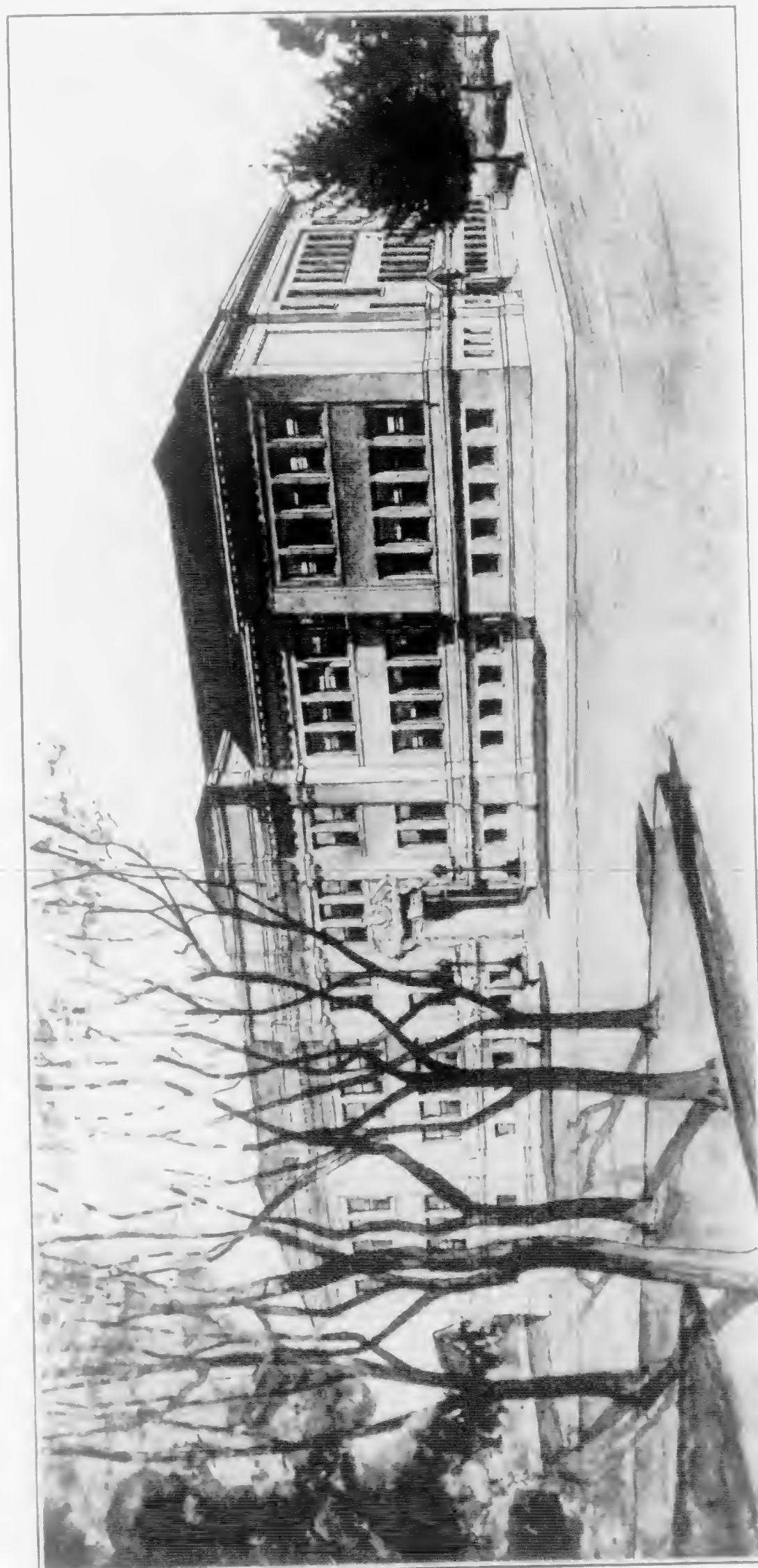


*Bird's Eye View of Idora Park Skating Rink Oakland
C. W. Dickey, Architect*

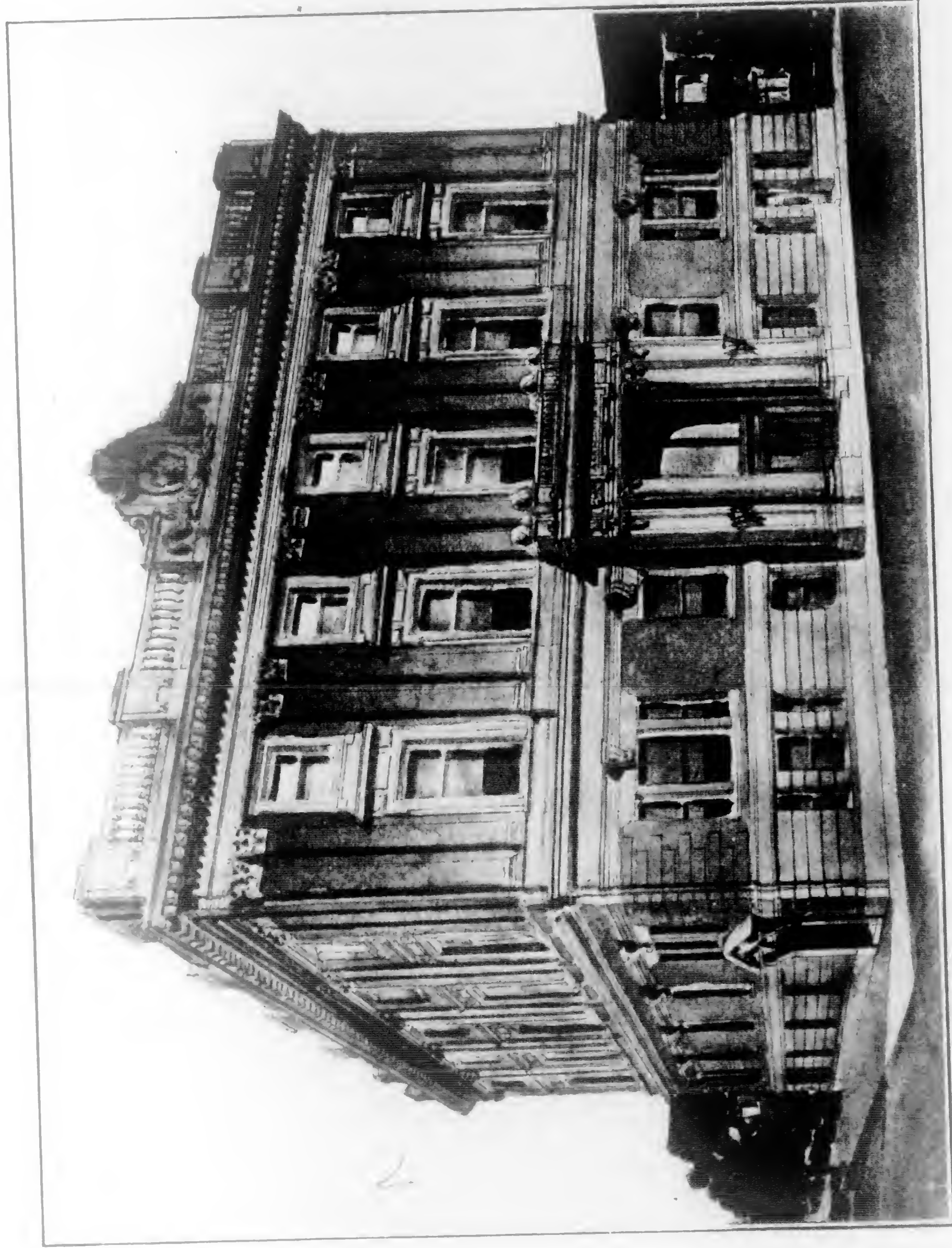


Entrance Idora Park Skating Rink

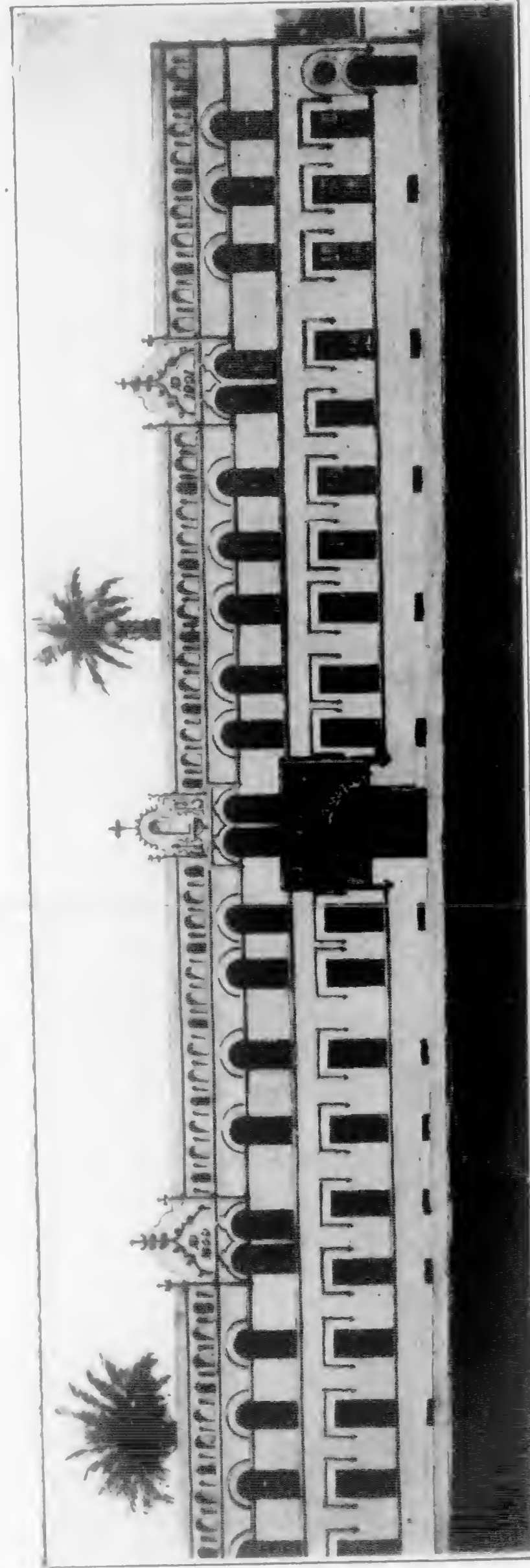
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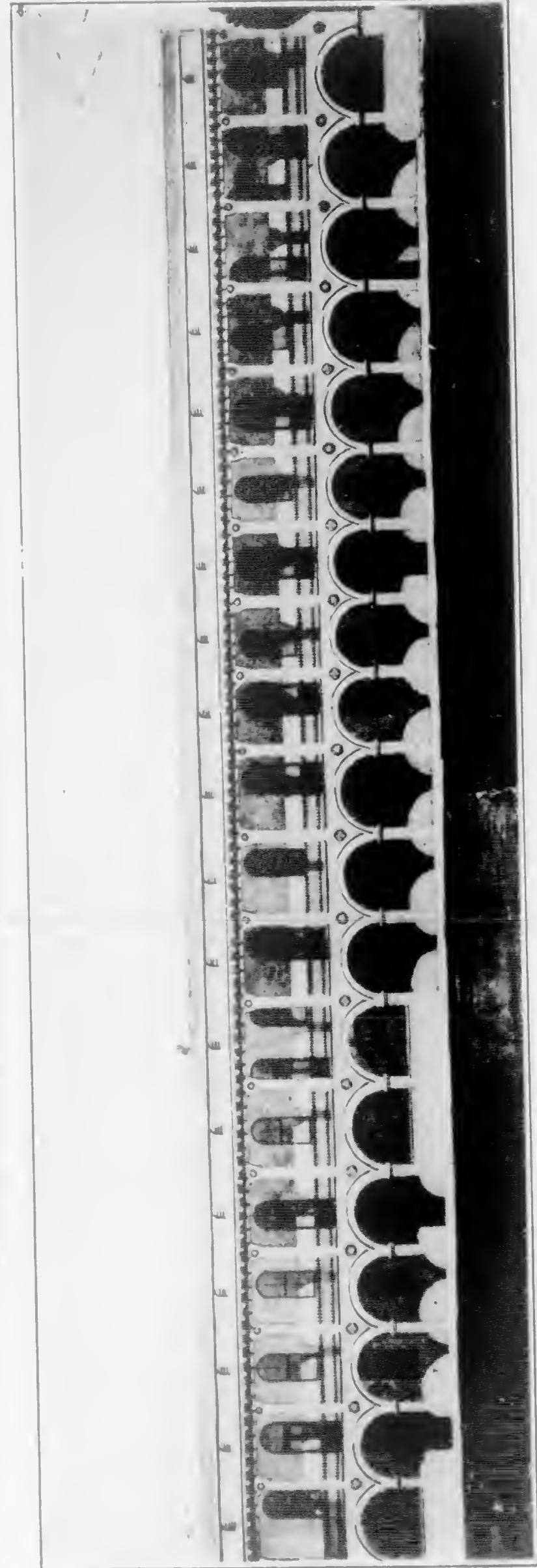
Market Street School Oakland - C. W. Dickey, Architect



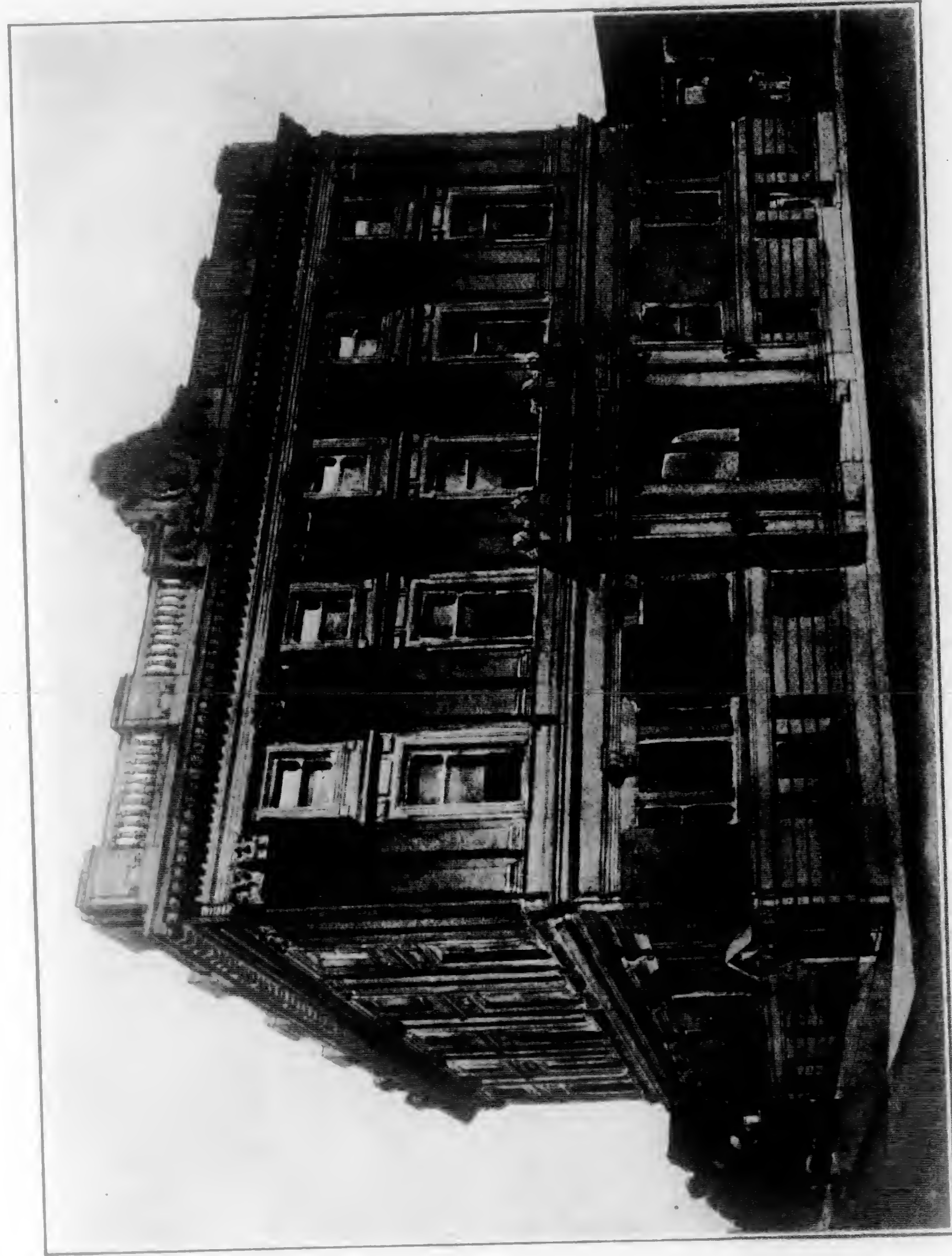
Sacred Heart Cathedral, Oakland - C. W. Puckey, Architect



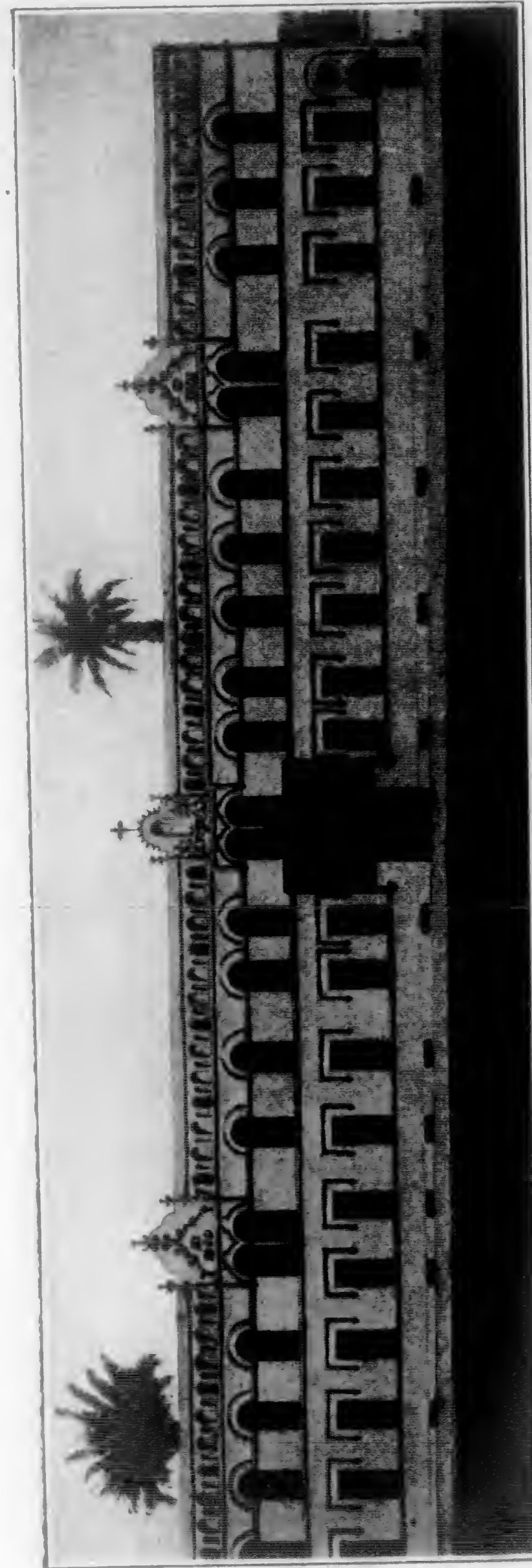
Sacred Heart Cathedral, Oakland (Front Street View) - C. W. Puckey, Architect



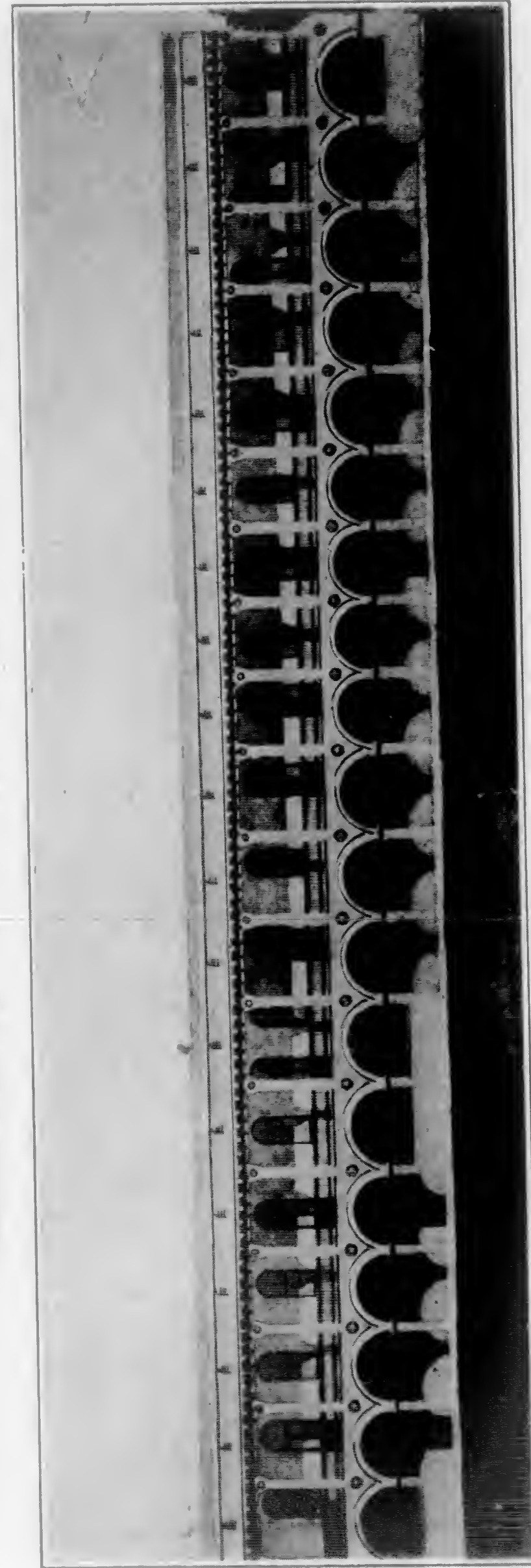
Sacred Heart Cathedral, Oakland (Interior View) - C. W. Puckey, Architect



Study for Scottish Rite Cathedral, Oakland. — C. W. Dickey, Architect



School for Convent of the Sacred Heart, Honolulu (Fort Street Front) C. W. Dickey, Architect

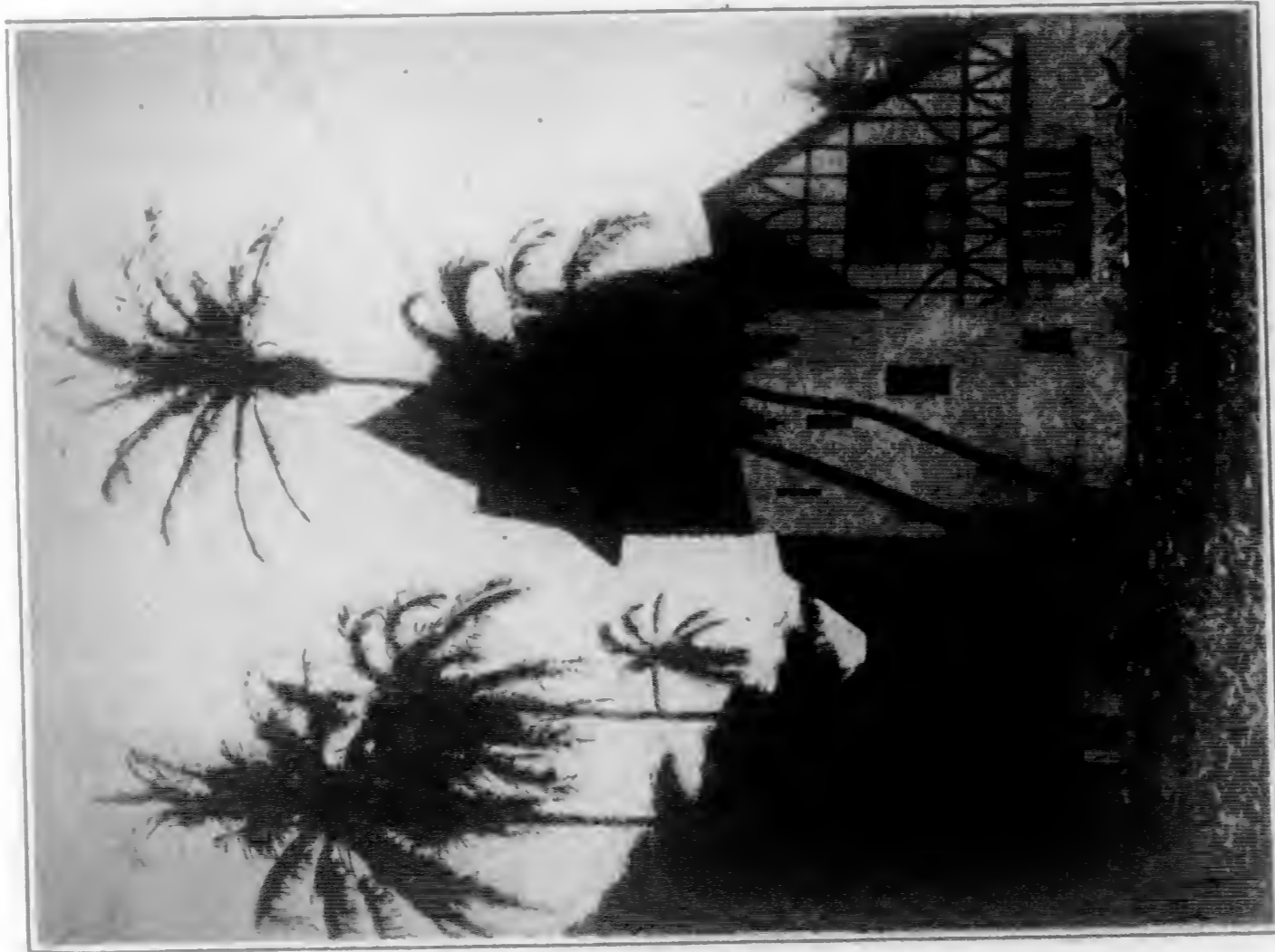


School for Convent of the Sacred Heart, Honolulu (Cloister Front)

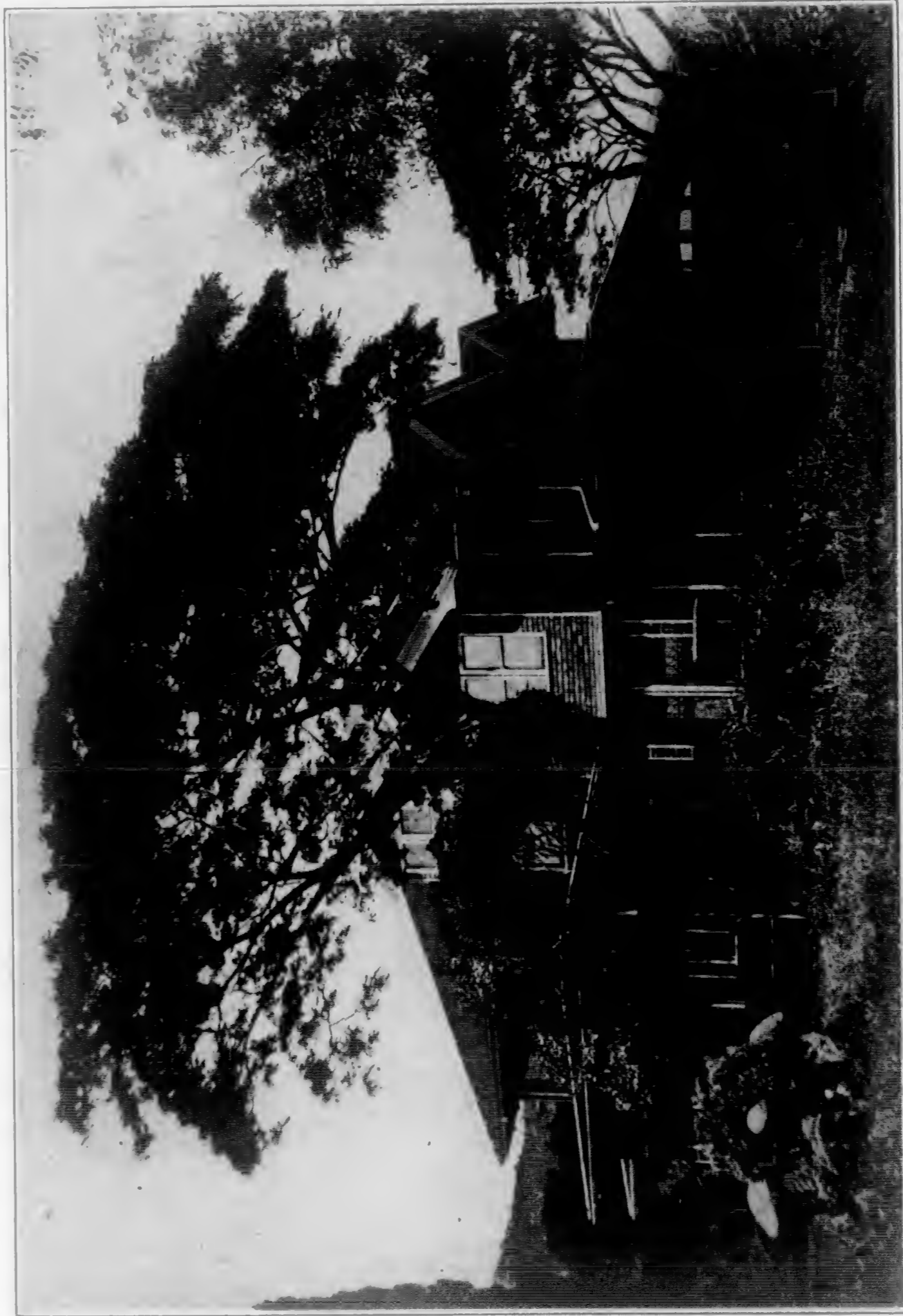


Entrance Baldwin Memorial Native Church

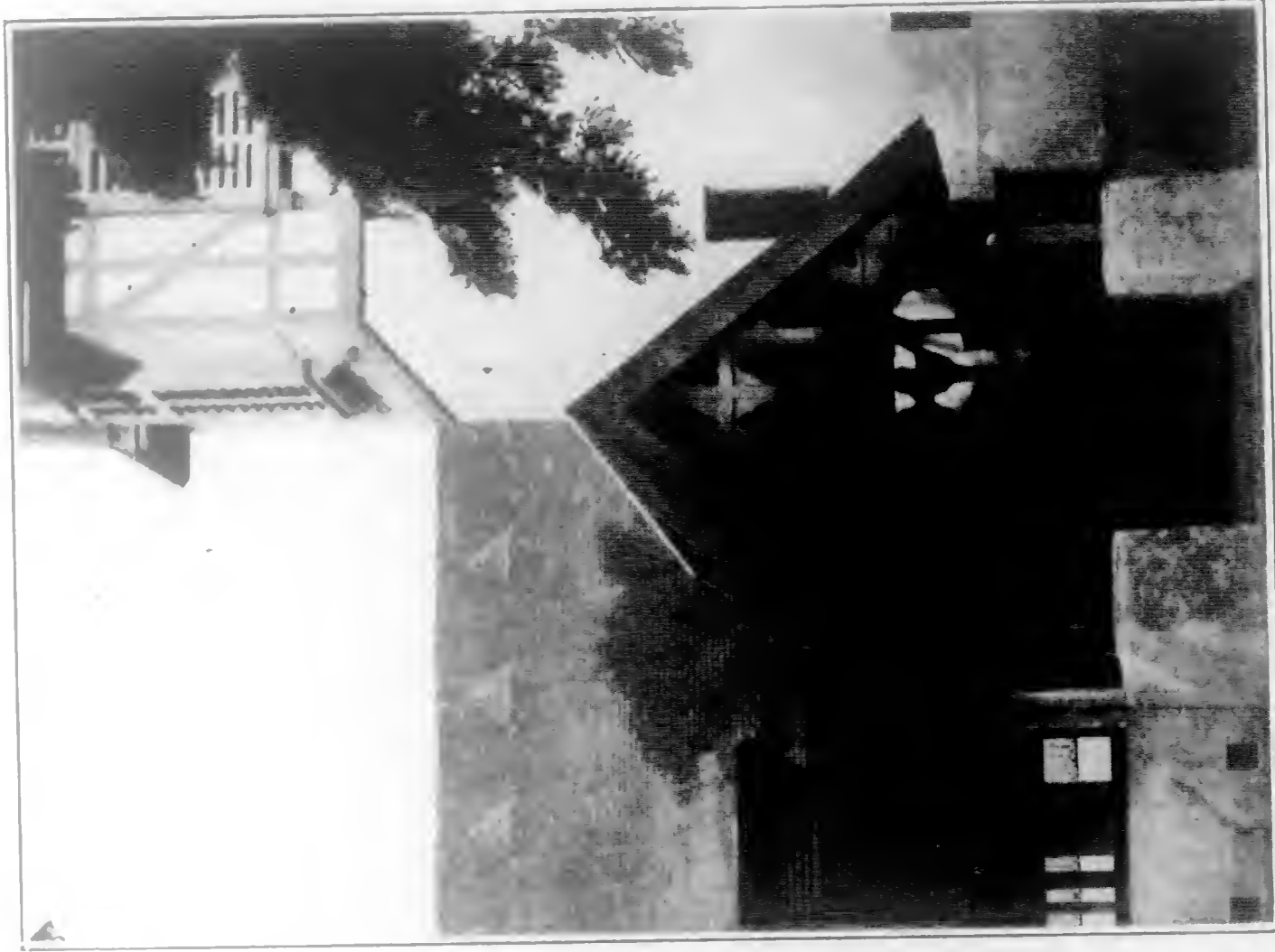
C. W. Dickey, Architect



Baldwin Memorial Native Church, Lahaina, Maui

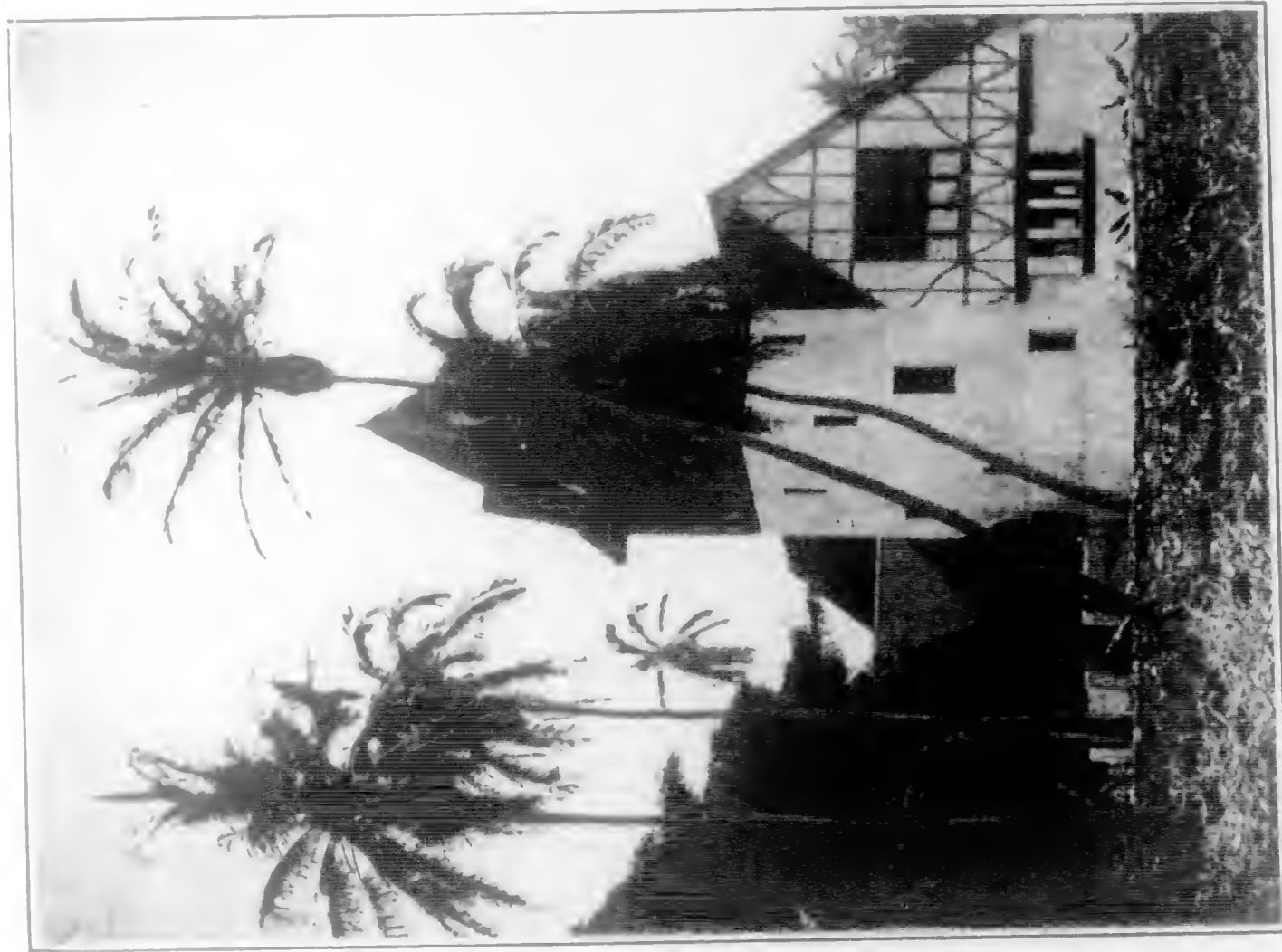


Residence of Cline Davies, Honolulu. — C. W. Dickey, Architect

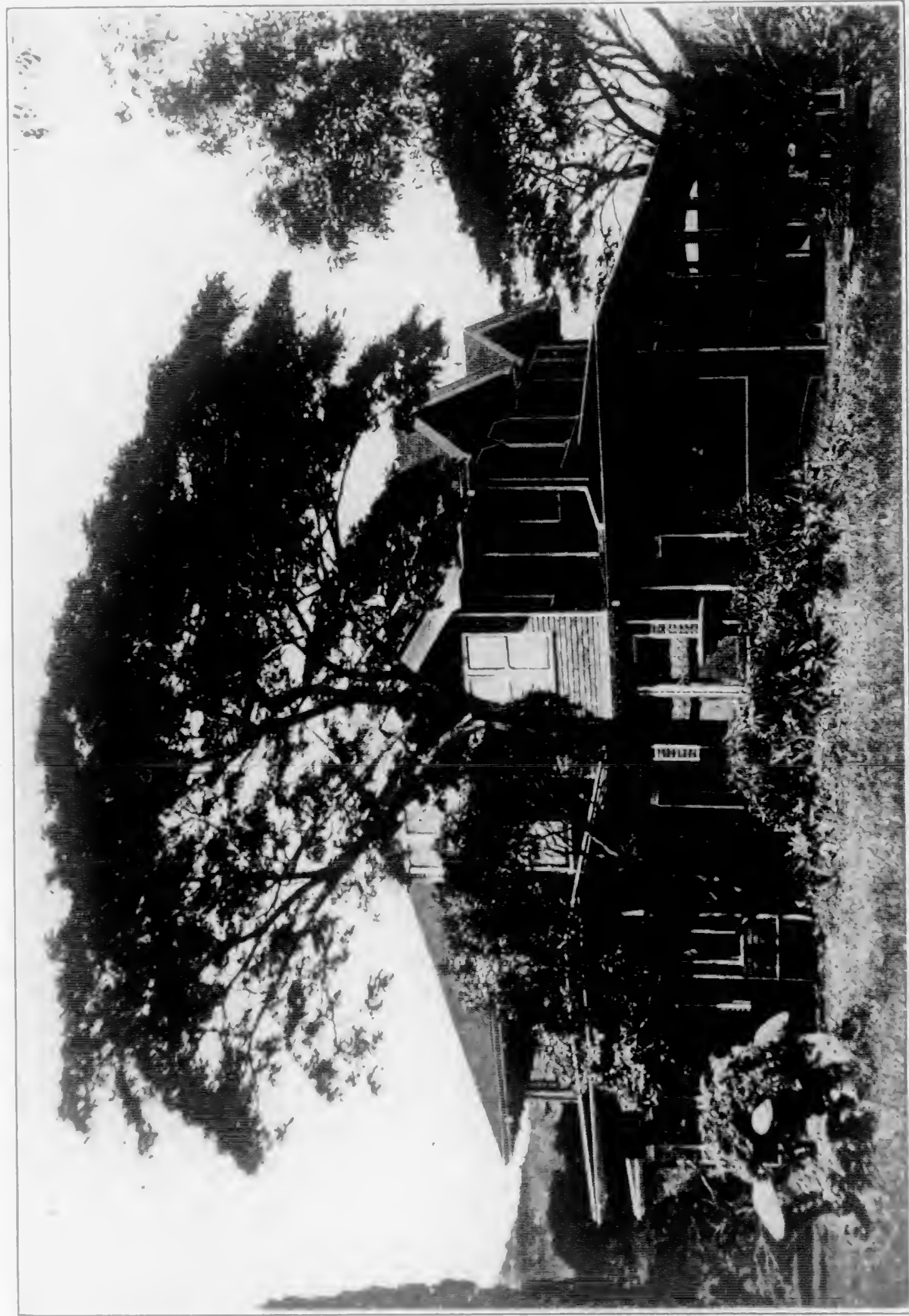


Baldwin Memorial Natree Church

C. W. Dickey, Architect



Baldwin Memorial Natree Church, Lahaina, Maui



Residence of Chas. J. Peck, Honolulu

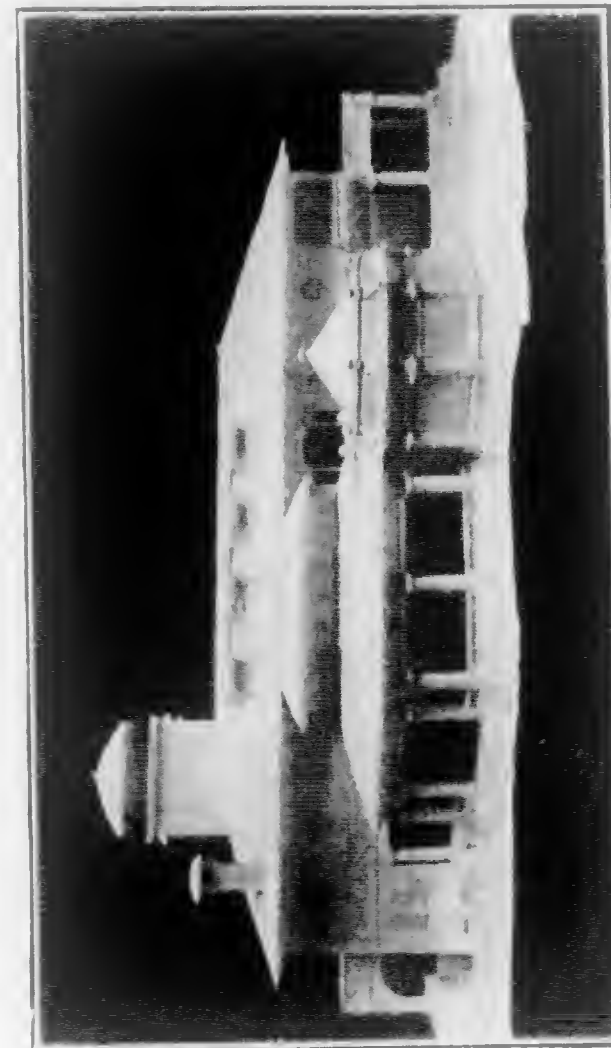
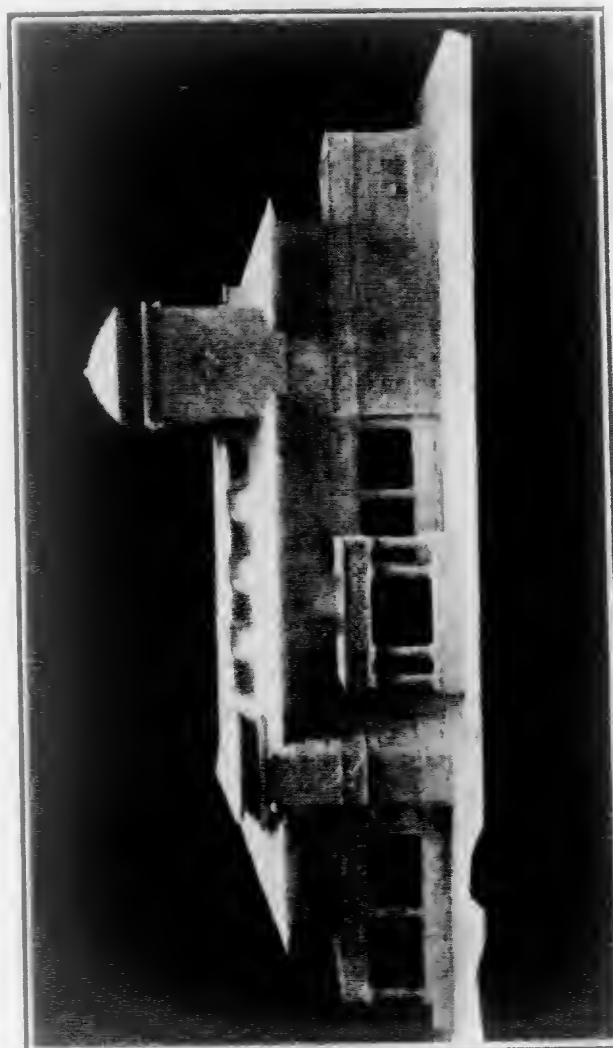
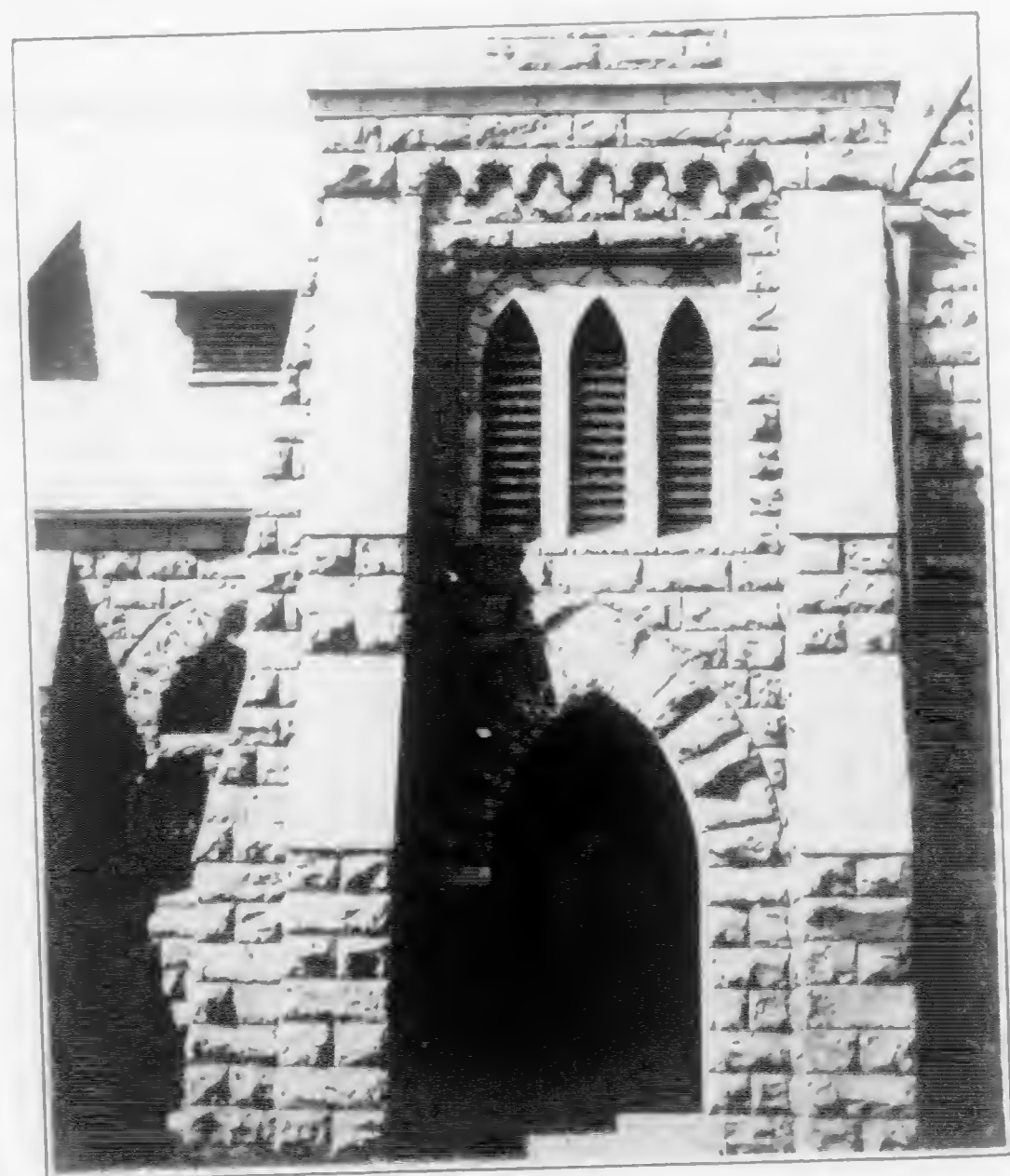
C. W. Dickey, Architect



BISHOP
MEMORIAL
CHAPEL,
Honolulu.

C. W. DICKEY,
Architect

Entrance
of
BISHOP
MEMORIAL
CHAPEL



Plaster Study of the Residence of William S. Erson, Honolulu
C. W. Dickey, Architect



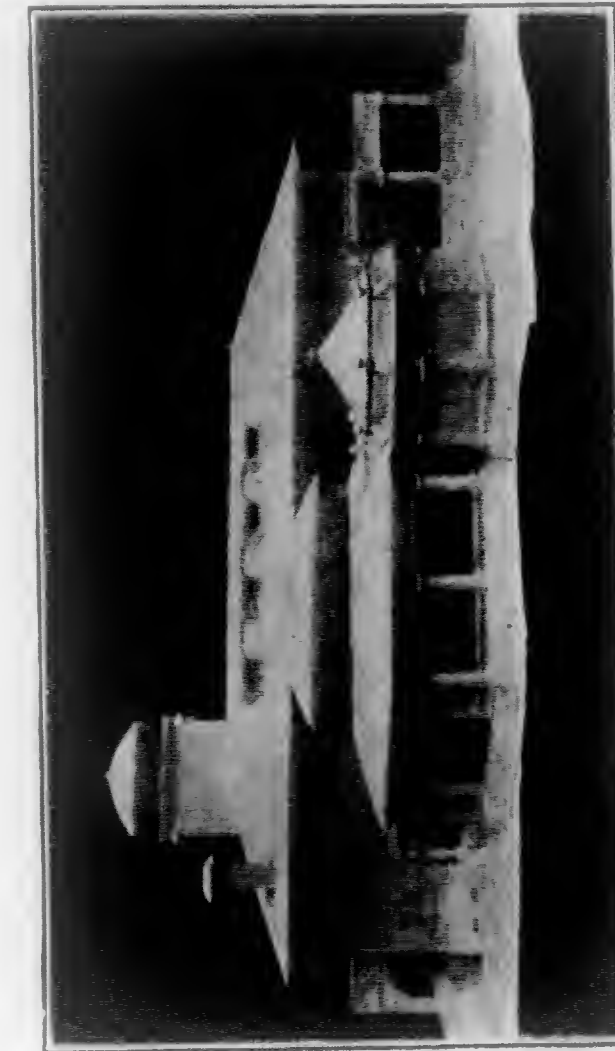
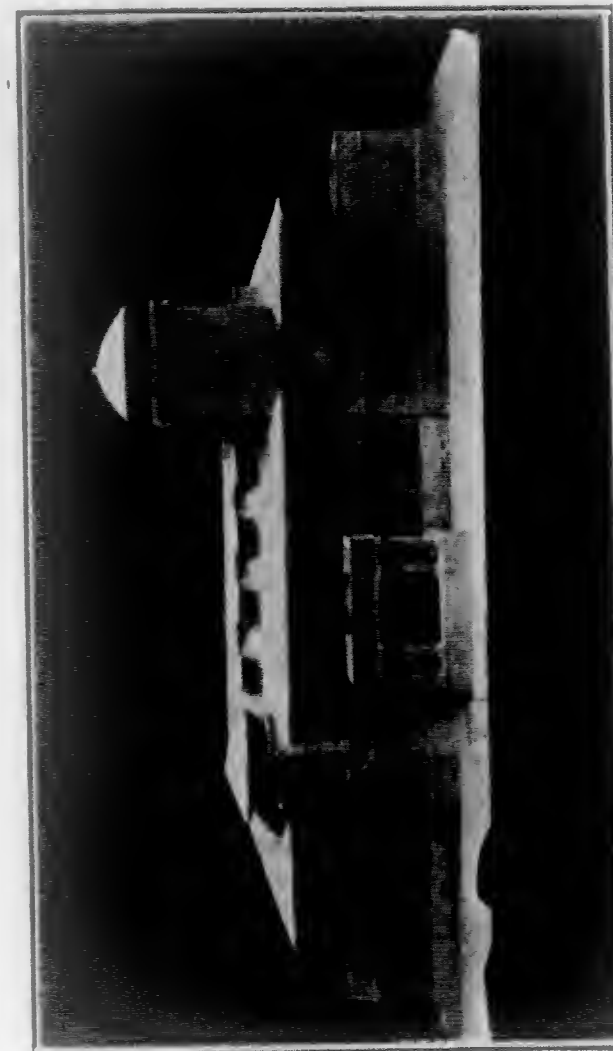
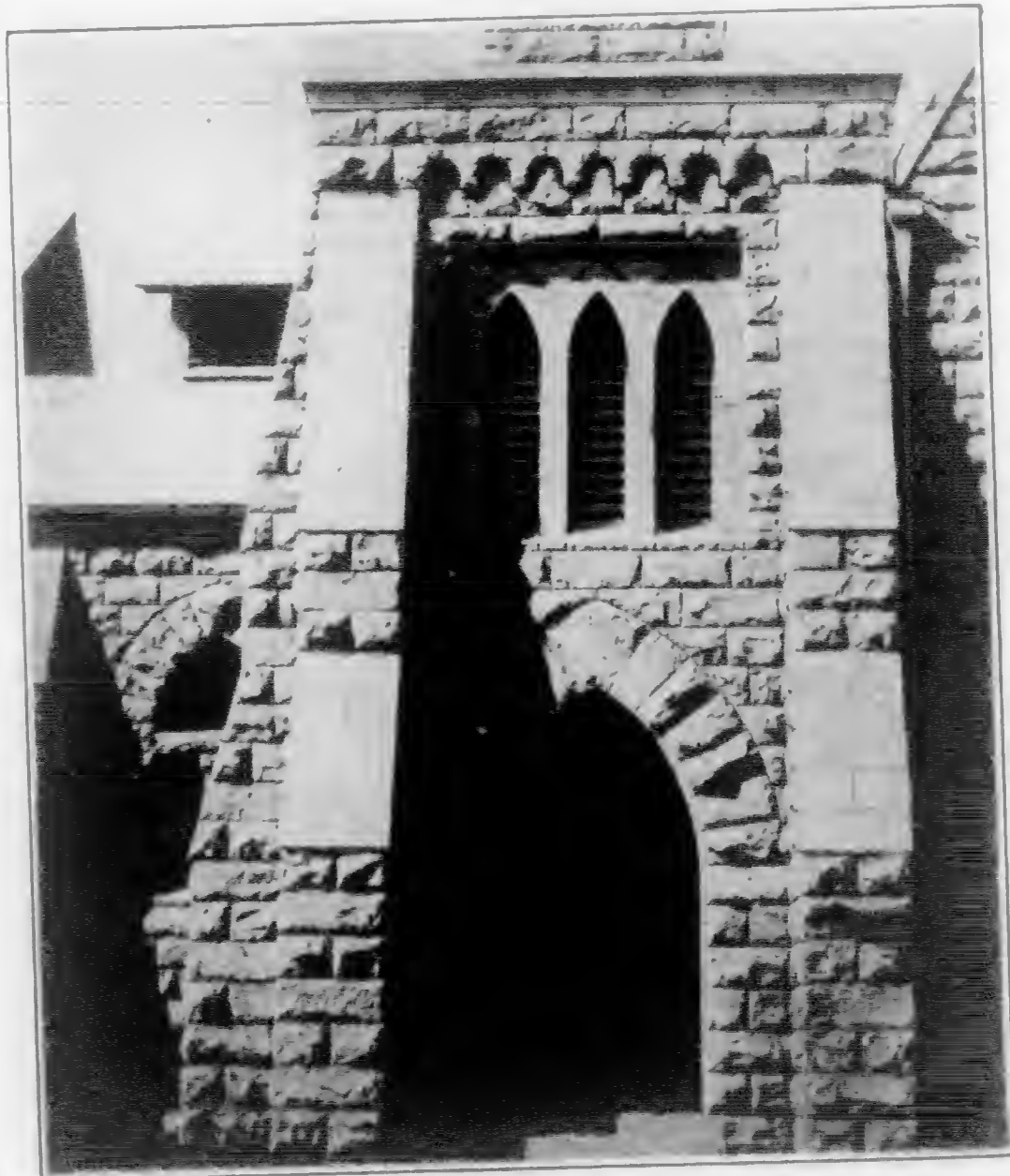
Plaster Study of the Residence of William S. Erson



BISHOP
MEMORIAL
CHAPEL,
Honolulu.

C. W. DICKEY,
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Entrance
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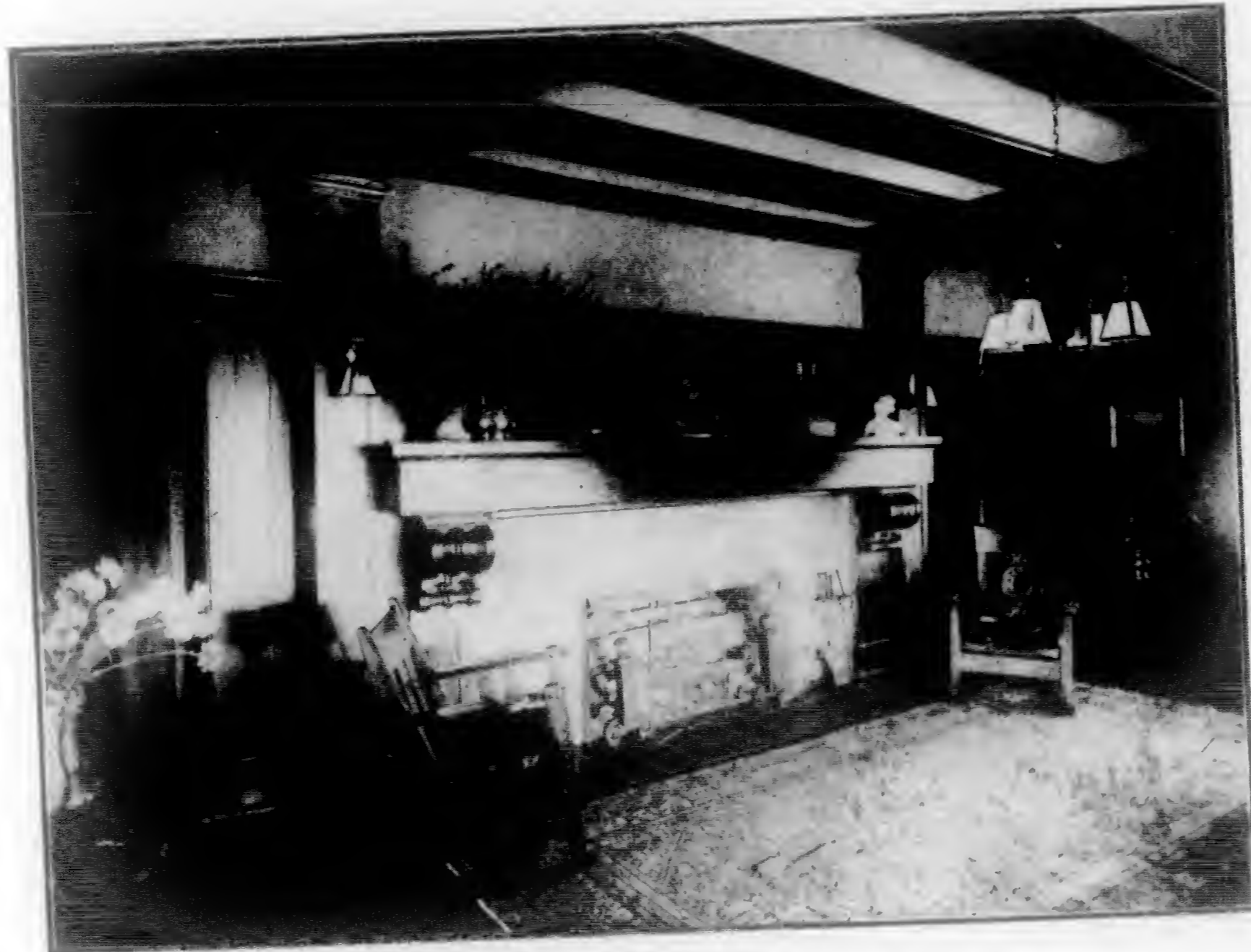
Plaster Models of the Residence of William S. Irwin, Honolulu
C. W. Dickey, Architect



Detail of Lanai, Residence of William S. Irwin



Residence of Wickham Havens, Piedmont
C. W. Dickey, Architect



Living Room in Residence of Wickham Havens, Piedmont
C. W. Dickey, Architect



Residence of Edward W. Engs, Piedmont
C. W. Dickey, Architect



Living Room in Residence of Edward W. Engs, Piedmont
C. W. Dickey, Architect



Residence of Wickham Havens, Piedmont
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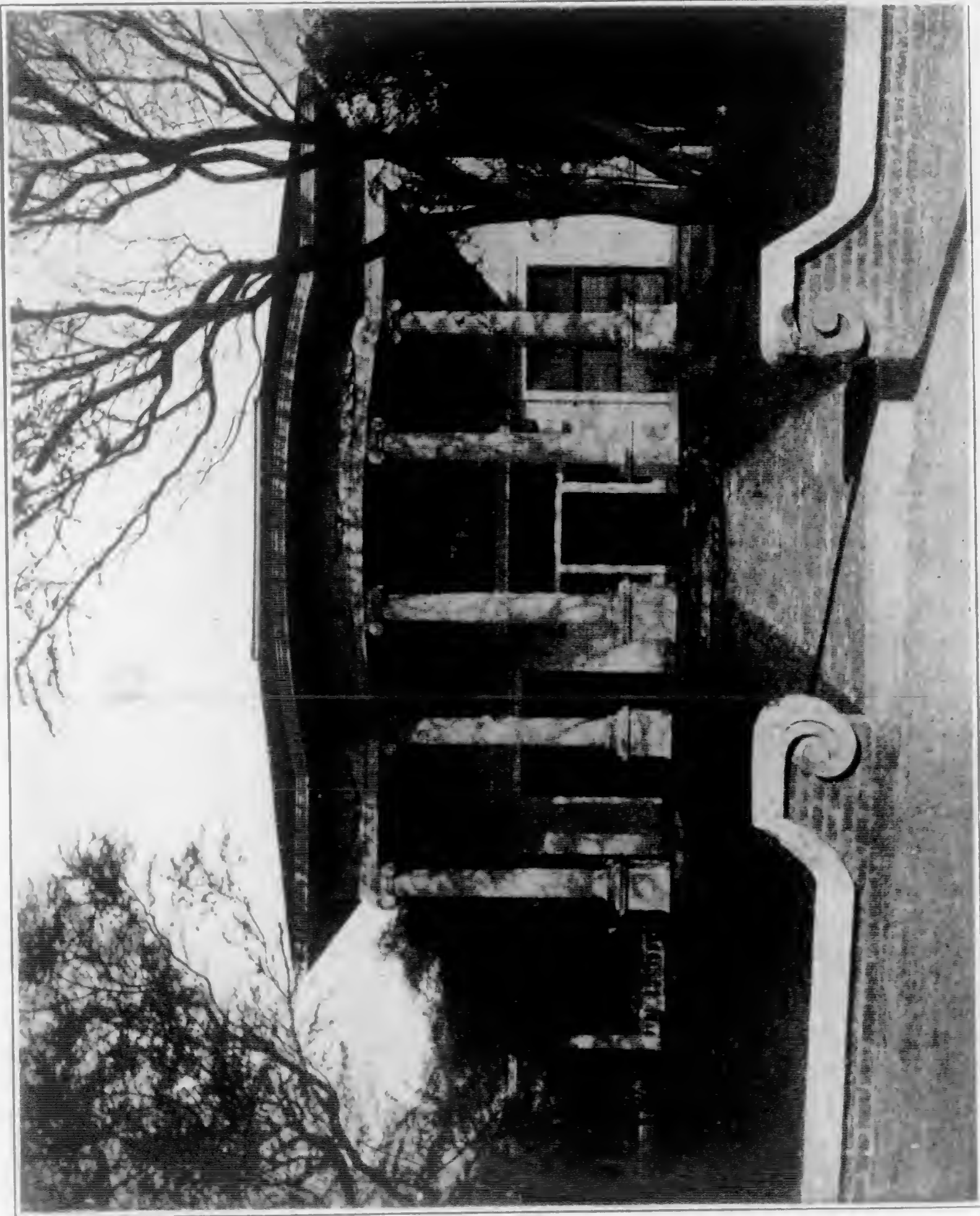
Residence of Edward W. Fings, Piedmont
C. W. Dickey, Architect



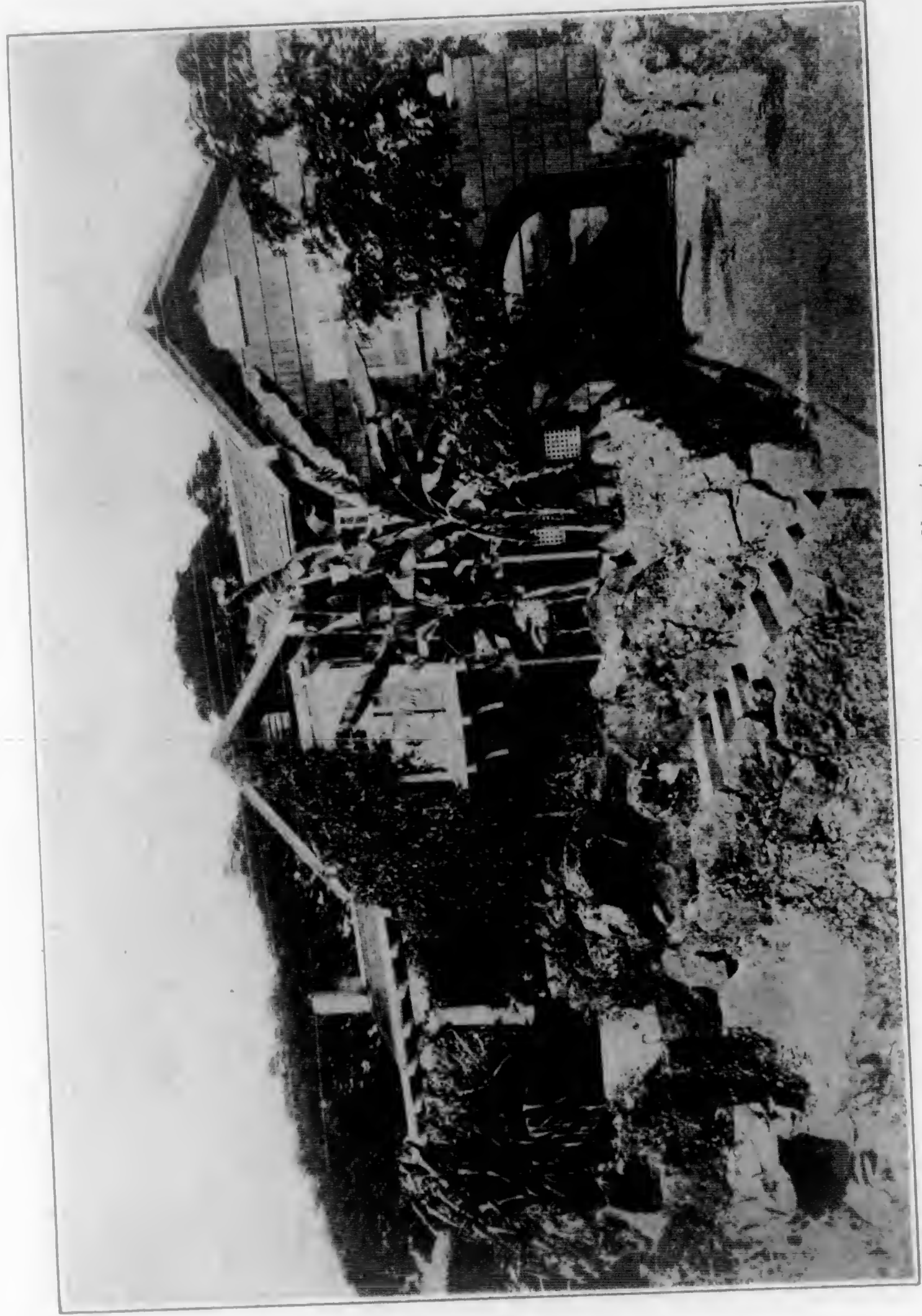
Living Room in Residence of Edward W. Fings, Piedmont
C. W. Dickey, Architect



Buildings of C. W. Dukey Honolulu



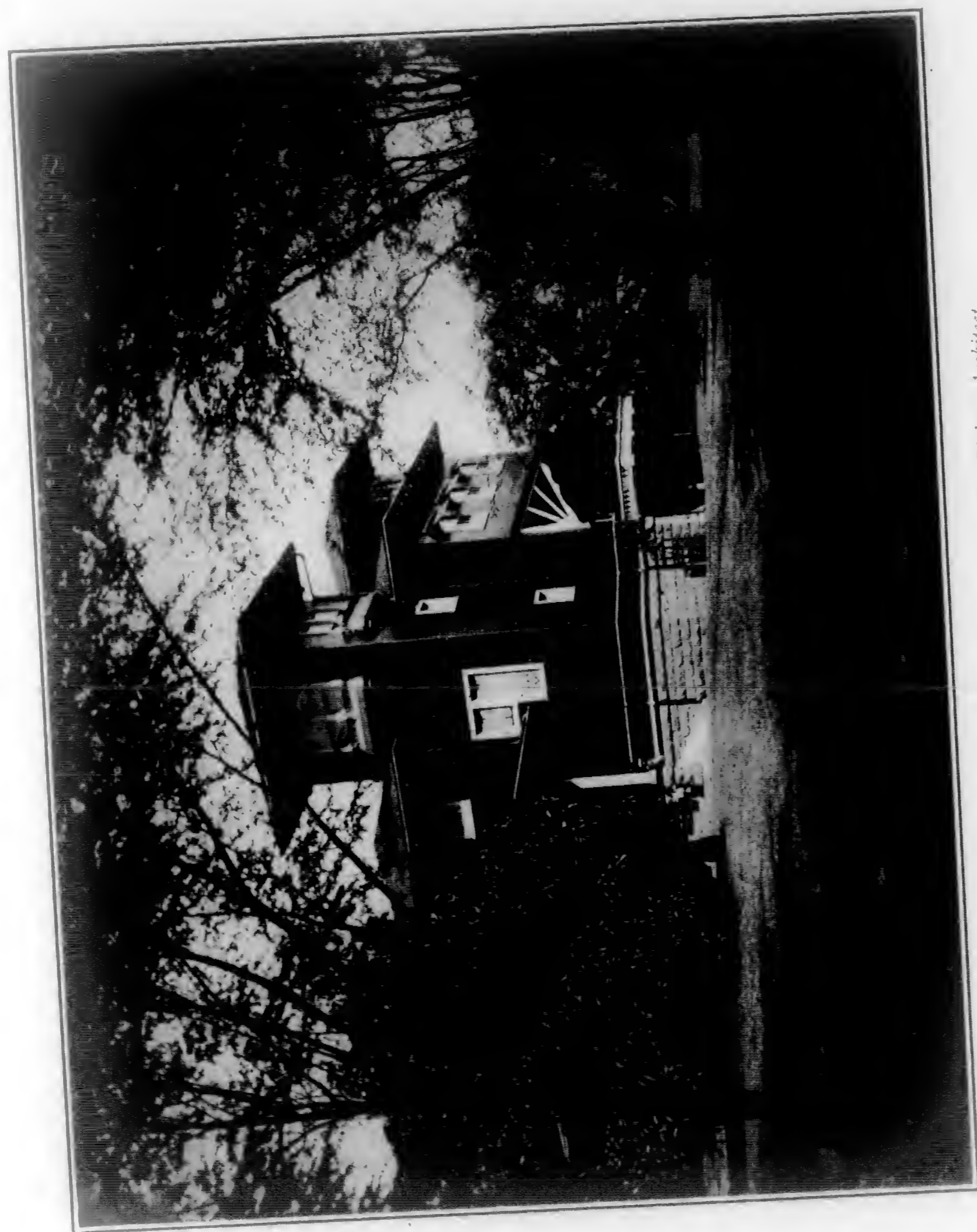
Residence of Frank Hays and Honolulu C. W. Dukey Architect



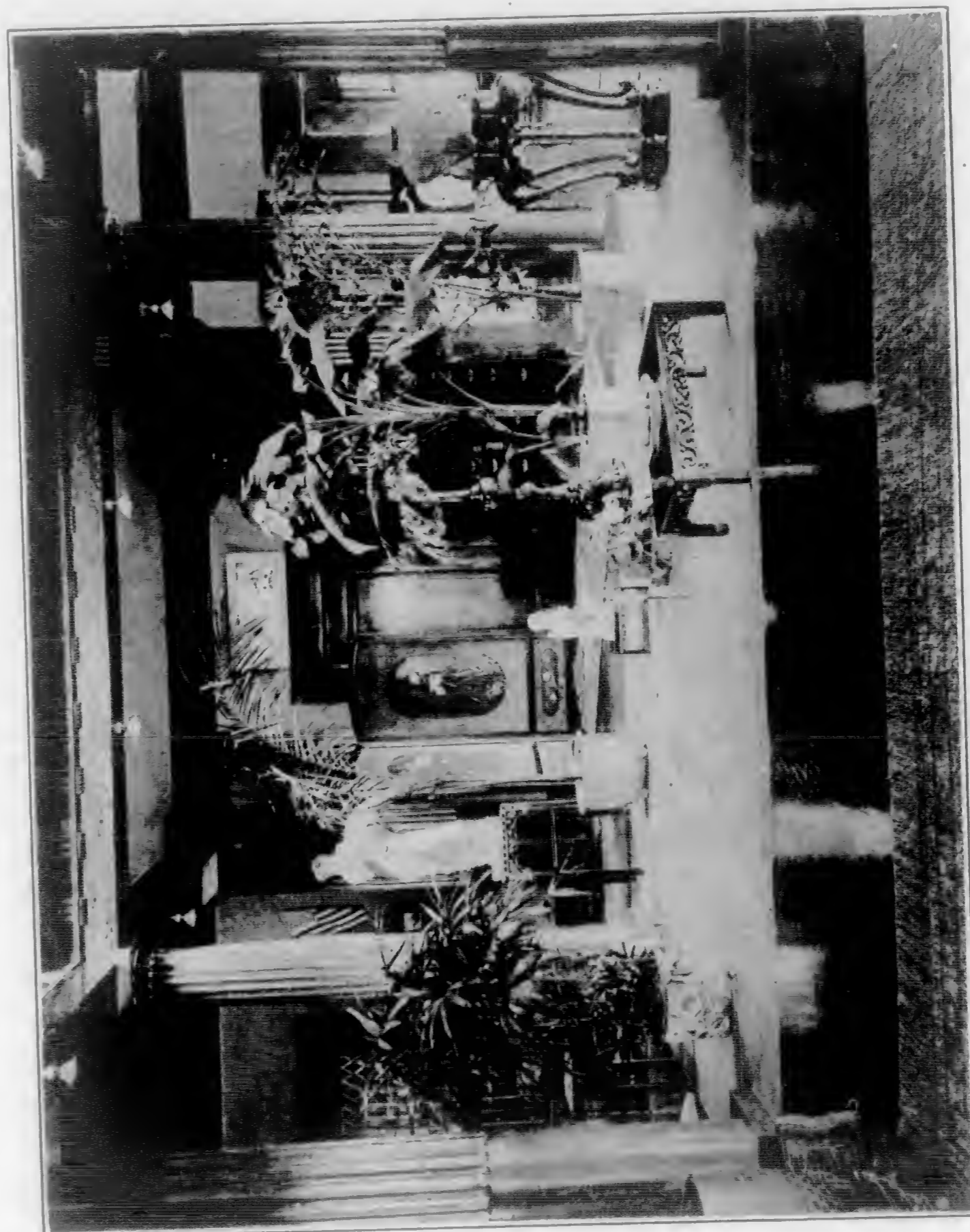
Bungalow of C. W. Dickey, Honolulu



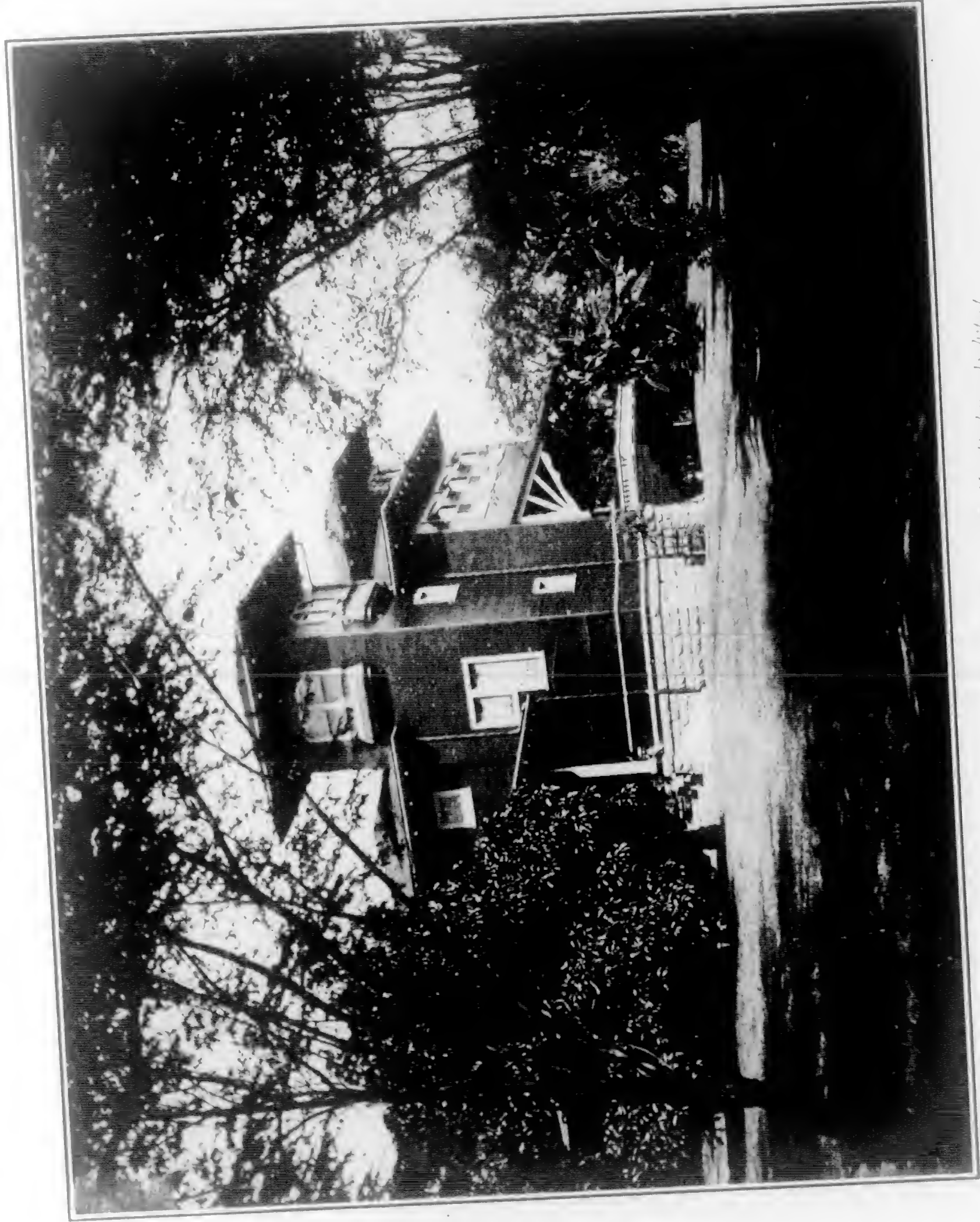
Residence of Frank Halstead, Honolulu. — C. W. Dickey, Architect



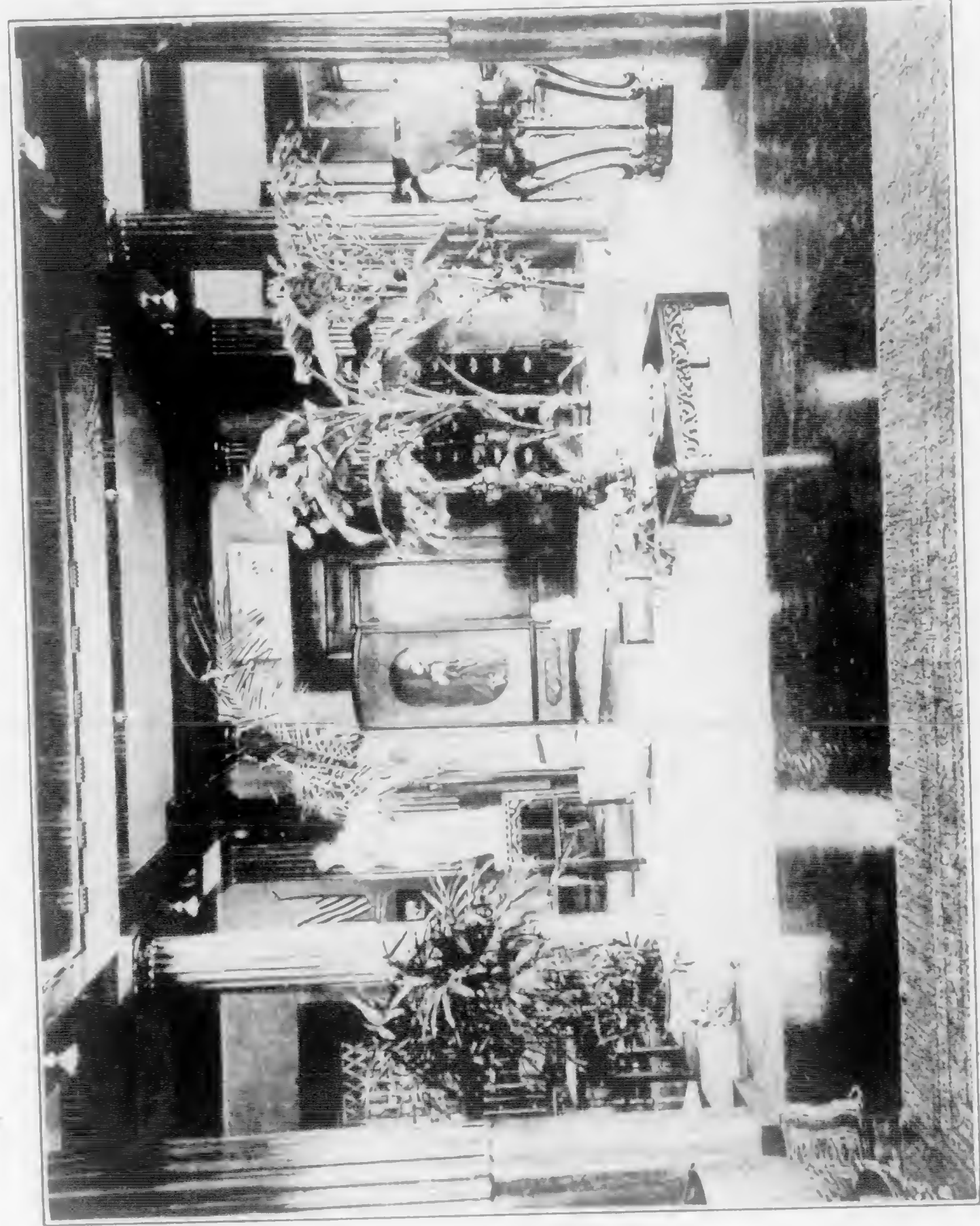
Residence of F. J. Lowrey, Honolulu. — C. W. Dickey, Architect



The Pompeian Room, Residence of F. J. Lowrey, Honolulu



Residence of F. J. Lacey, Honolulu. C. W. Drake, Architect



The Conference Room, Residence of F. J. Lacey, Honolulu



Residence of F. D. Tenney, Honolulu



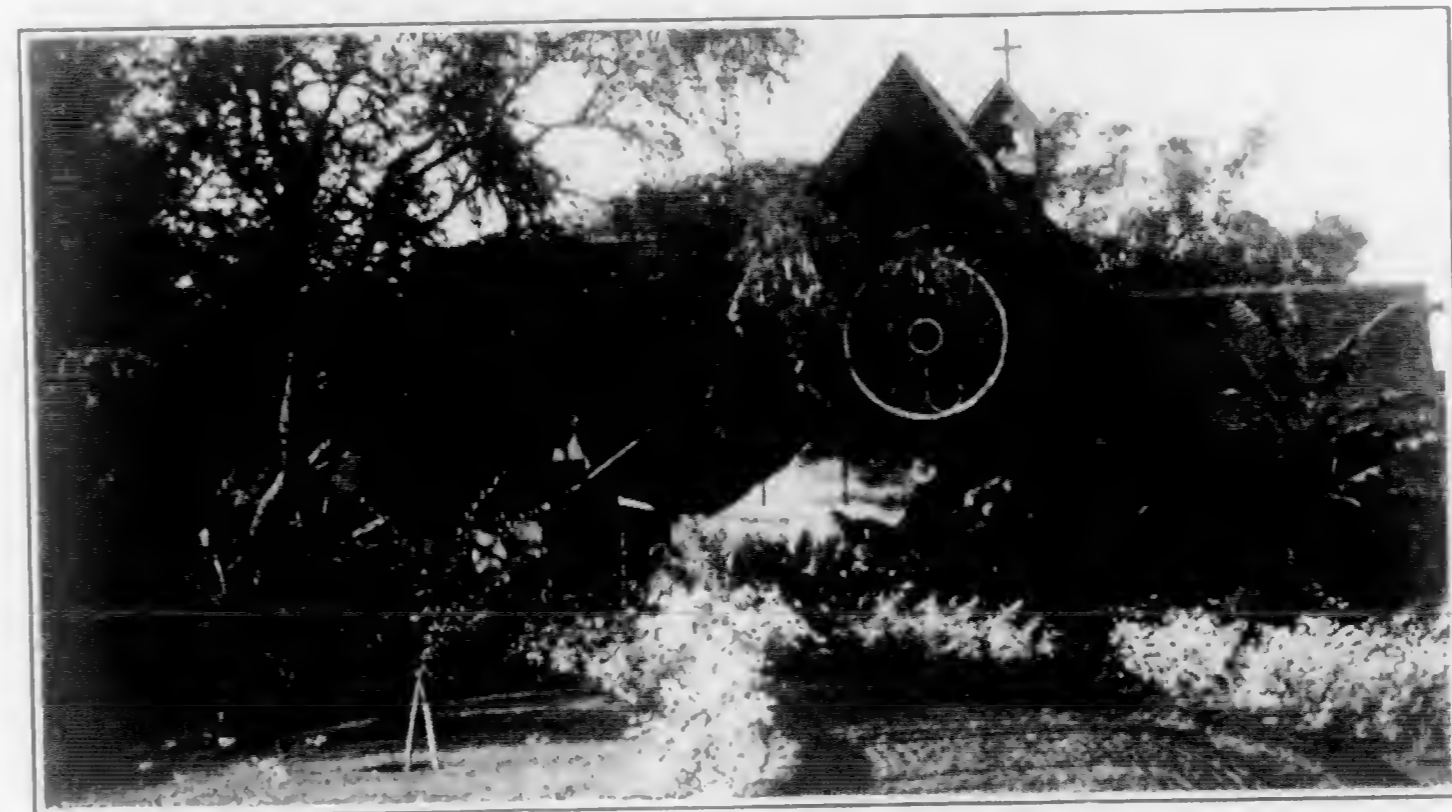
Bungalow of D. F. K. Isenberg, Honolulu



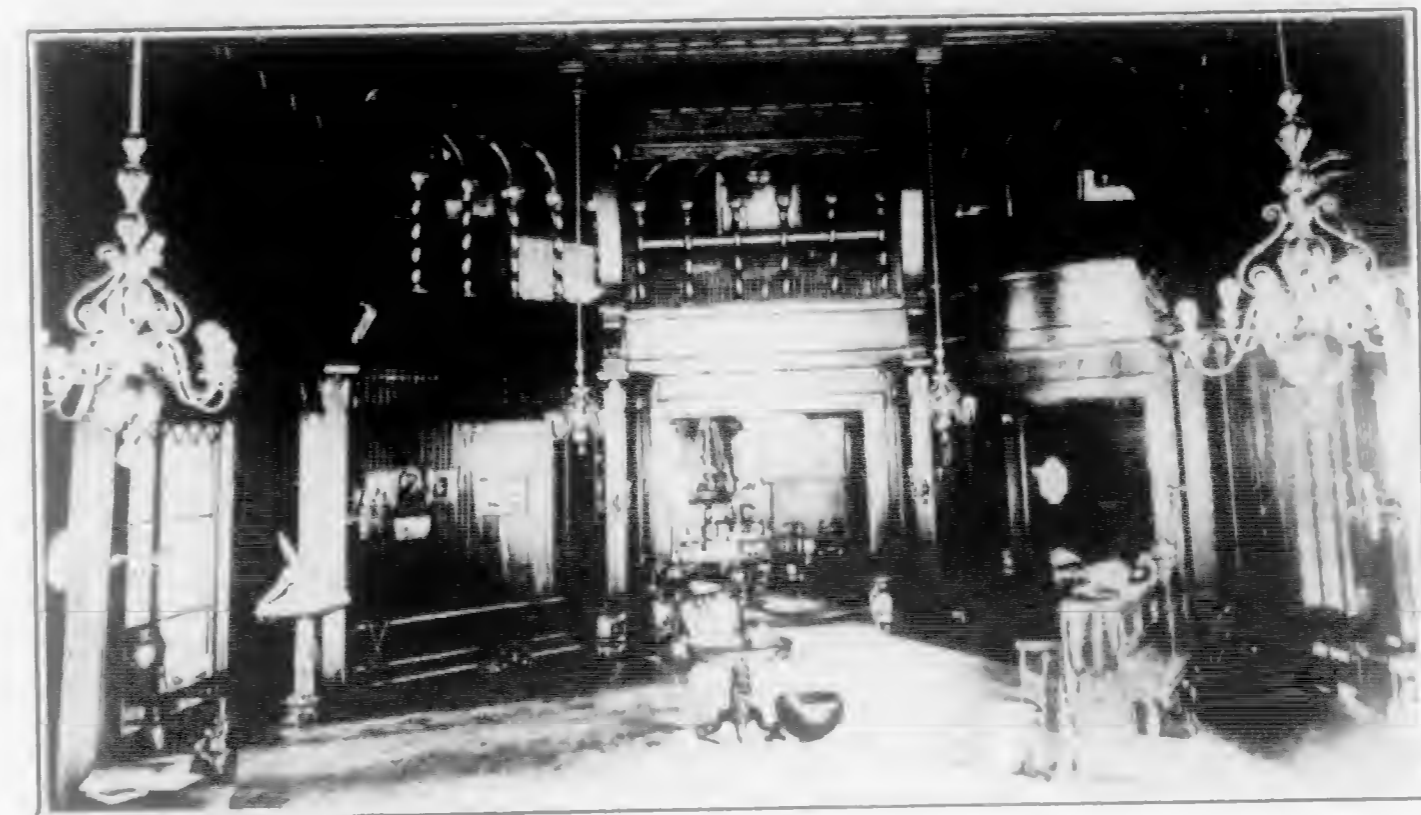
Residence of J. P. Cook, Honolulu



Bungalow of Henry E. Cooper, Honolulu



St. Clement's Episcopal Chapel, Honolulu



Living Room in Residence of W. S. Irwin, Honolulu



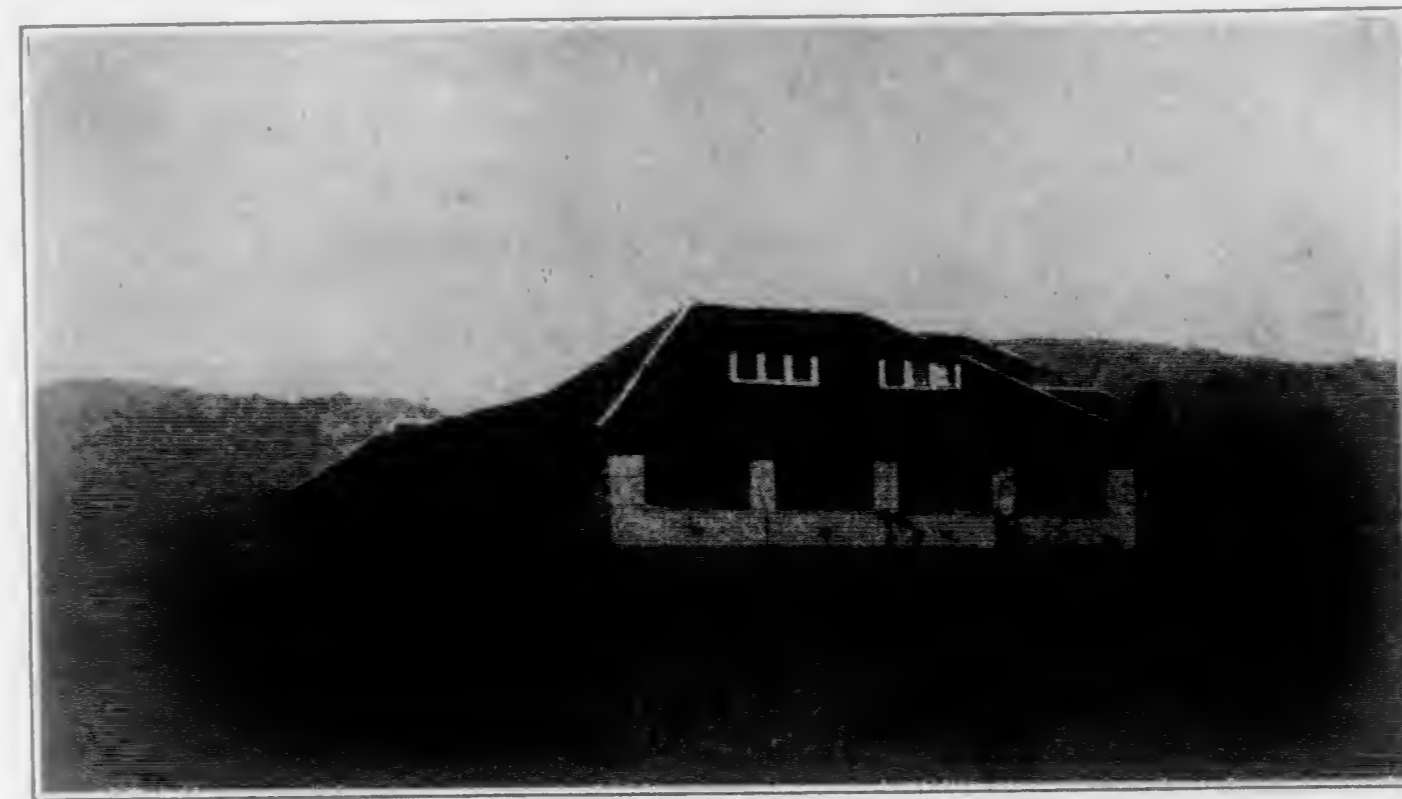
Residence of E. D. Tenney, Honolulu



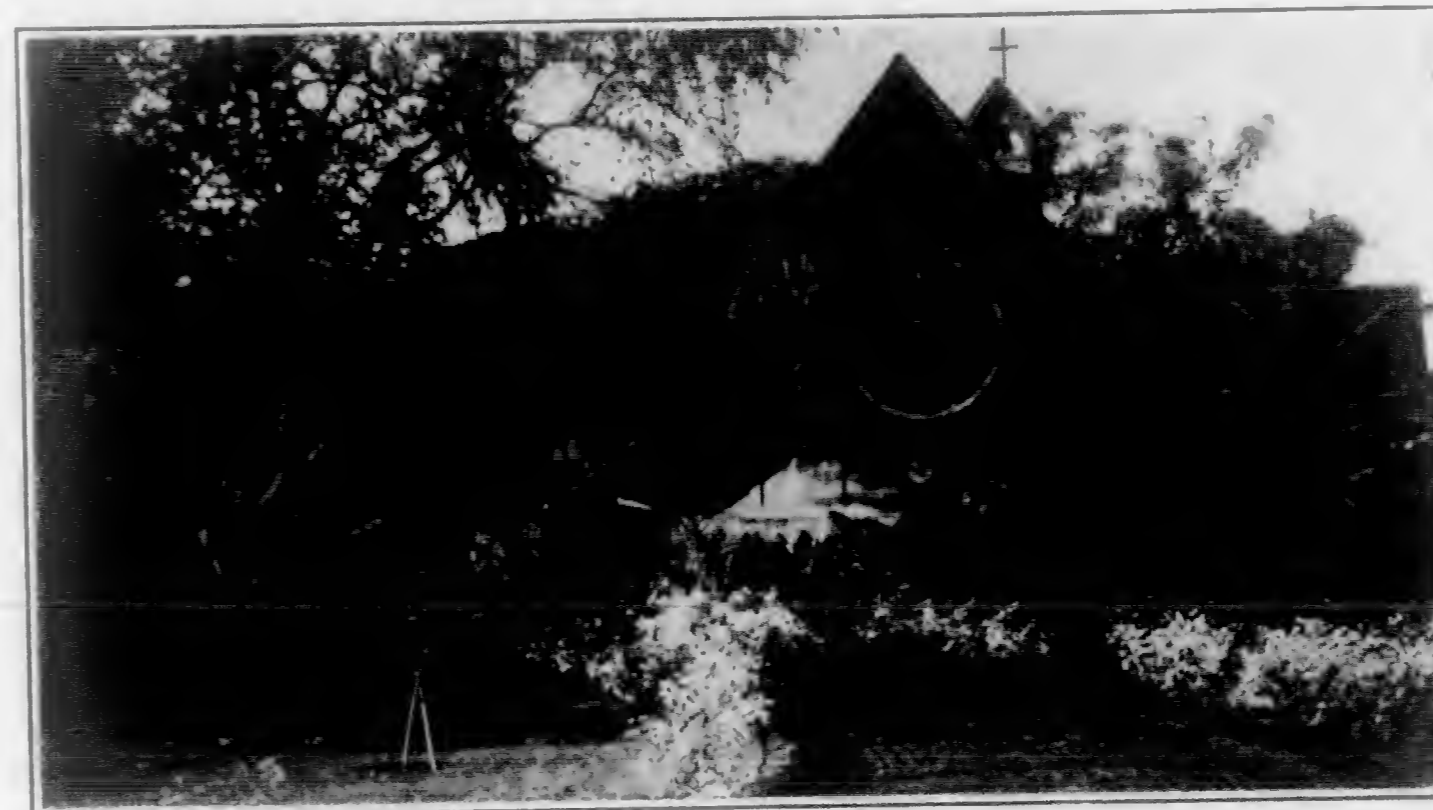
Bungalows of D. P. R. Isenberg, Honolulu



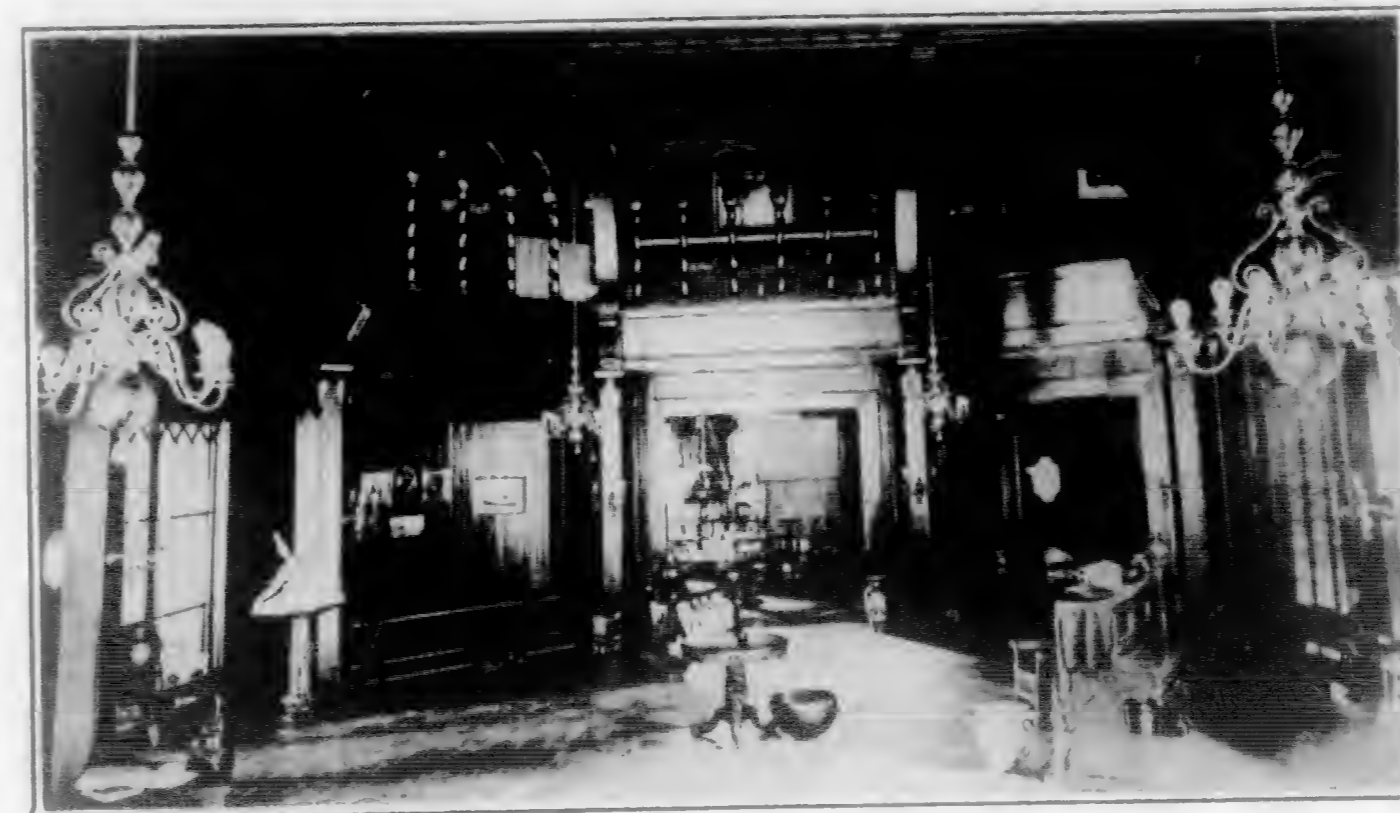
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Central Fire Station, Honolulu. — C. W. Dickey, Architect



Telephone Building, Oakland

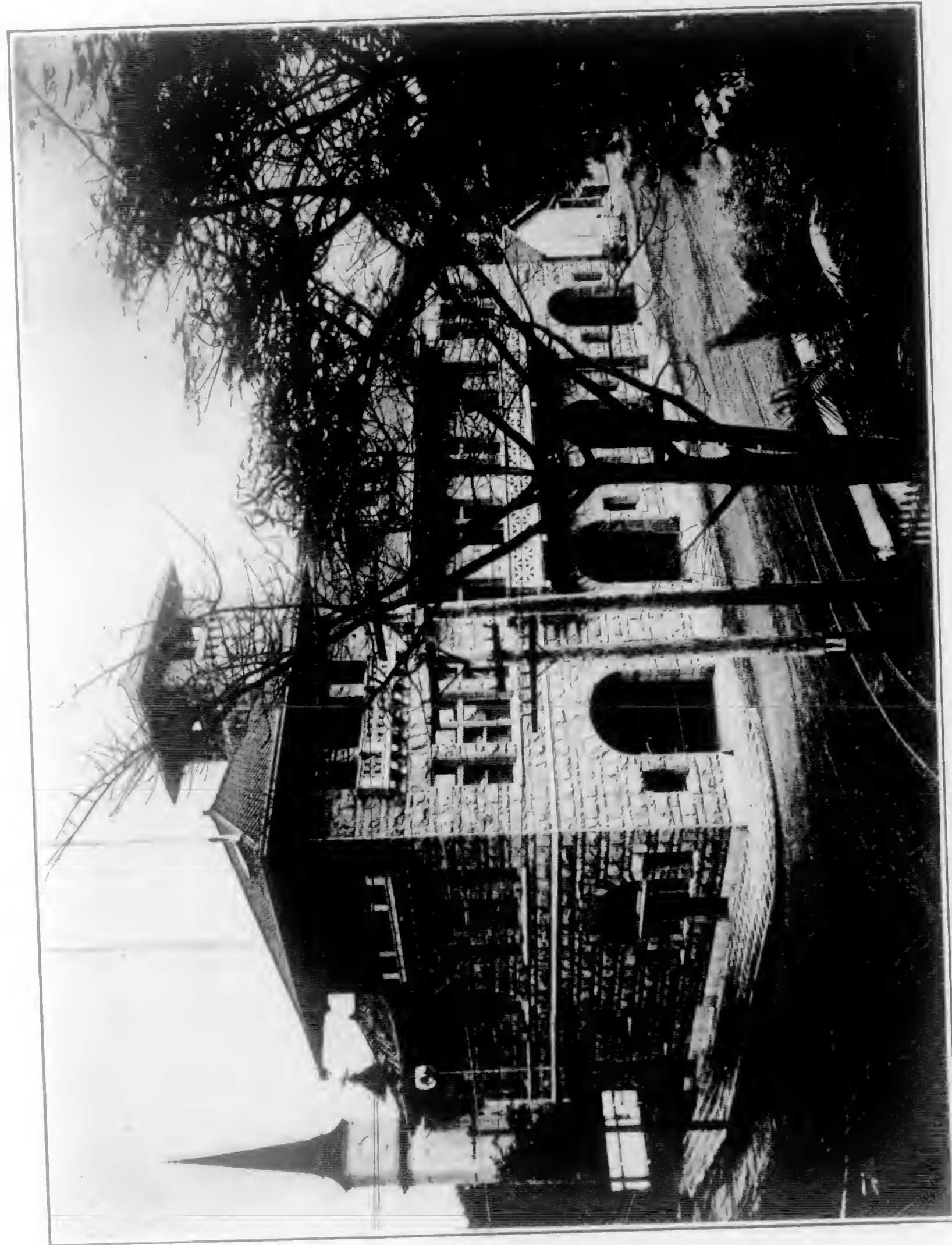
C. W. Dickey, Architect

Two Substantial Oakland Buildings

BUILDING construction in Oakland is going ahead in a most satisfactory manner, two of the most important jobs now under way being the Pacific States Telephone building at Forty-fifth and Telegraph avenue and the Taft and Pennoyer building at Fourteenth and Clay streets. The former was designed by Architect C. W. Dickey of Oakland and the last named building by Architects John Parkinson and Edwin Bergstrom of Los Angeles. The Roberts Brothers Company, contractors of Oakland, have the work well in hand on both jobs. The telephone building is expected to be ready for occupancy by the first of November or earlier. The structure is of reinforced concrete with polished wired plate glass in all the exterior windows, metal frames and sashes, metal covered doors, and in fact every modern appliance that goes to make a perfect fire-proof building. The estimated cost of the building is \$49,000.

The excavating for the Taft and Pennoyer building is finished and the Roberts Brothers Company are now busy on the foundations and retaining walls. This building will cost \$500,000. More than 30,000 cubic yards of soil were removed in preparing for the foundations—the largest excavation, by the way, ever made in Oakland for building purposes. A reinforced concrete basement fourteen feet in the clear will be put in, more than 4000 barrels of cement and 100 tons of steel for reinforcing being required.

The building will be four stories and basement, with a frontage on Clay street from the curb of Fourteenth street to that of Fifteenth street of 238 feet and from the curb line of Clay street to the rear of the lot on Fifteenth street 214 feet, and between the same points on the Fourteenth street frontage, 114 feet.



Central Fire Station Honolulu. C. W. Dickey, Architect



Telephone Building Oakland. C. W. Dickey, Architect

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*The Taft and Penoyer Building, Oakland
John Parkinson and Edwin Bergstrom, Architects*

The Value of Punctuality

Punctuality is a very admirable and commendable quality of character in anybody, but it is particularly so in a business man. It shows true appreciation of the value of one's own time, as well as the time of others, and bespeaks a scrupulous sense of honor and self-respect, which are very important and essential features of character in the honest business world. A man who lacks these qualities of character, to a great extent, it matters not how well he may be equipped otherwise, will not only suffer many losses in a commercial sense, but will be regarded as unreliable and unsafe in all business transactions involving large sums of money, and as untrustworthy in a moral sense, in matters pertaining to social and civic duty. Aside from these points of consideration, punctuality may involve the welfare and even the life of human beings. The many different ways in which the truth of this statement might be demonstrated, we leave entirely to the reader, with the pertinent reminder that history is full of instances that serve to justify this assertion, besides those which may have come under the reader's own personal observation, and within his own personal experience. To the employer, punctuality in the employe is one of the most admirable of all other qualities, for it tells of other qualities that generally go with it. He knows that if the employe be strictly punctual, he is most likely to be careful and conscientious in the performance of his work, and he is also likely to be diligent, and to manifest a real interest in the things that pertain to the welfare of his employer. The employer who is not punctual in the performance of his own duties is not likely to arouse the enthusiasm of his employe in this direction, and, as a consequence, his business will suffer in the matter of its management, as well as in every other department.—Hardware.

The Rebuilding of San Francisco—Reinforced Concrete Buildings

By WM. HAM. HALL, C. E.

WITHIN the fiscal year ending with June, just past, the erection of seventy-eight reinforced concrete buildings has been commenced in the burned-over area of the April, 1906, San Francisco fire. This number is thought to include all of this class, except, possibly, some small ones not noticeable. It does not, of course, include steel frame buildings, having reinforced concrete parts. It is safe to say that there never before has been near as much work of this character going on in any one city at one time. Considering the fact that prior to the great earthquake and fire, reinforced concrete construction was not provided for in the San Francisco building ordinance, and that not one complete building of that class had ever been permitted here, this is a remarkable showing.

We had at the Stanford University two buildings of reinforced concrete, the Robles Hall and the main part of the Museum building. Over on the Alameda marsh there was the Borax Company's building, and in San Francisco the six-story Academy of Science, whose interior floors and balconies were of reinforced concrete anchored to brick exterior walls. These were the notable structures of this material within the range of the great earthquake.

Not one was a good example of a complete reinforced concrete building. Nevertheless, the experience of them opened the way for reinforced concrete construction where before it had been firmly closed and apparently sealed by irrevocable official, professional and trade condemnation in San Francisco.

The declared uses of these buildings, thus far started in our city, are about as varied as well could be, there being 14 intended for store purposes, 14 office buildings, 10 warehouses, 5 factories, 1 flouring mill, 3 loft buildings, 2 wholesale store buildings, 1 wholesale market, 1 store and residence structure, 7 combined store and office buildings, 4 store buildings with rooming accommodations on the upper floors, 1 store and bank, 2 office and bank, and 1 bank building, 1 apartment house, 2 rooming houses, 1 residence, 2 hotels, 1 club building, 1 sanitarium and 2 power stations.

Summarized according to stories, we have: 4 one-story, 11 two-story, 21 three-story, 8 four-story, 7 five-story, 9 six-story, 8 seven-story, 7 eight-story, 1 nine-story and 1 ten-story, and sixty-seven have basements in addition to the stories enumerated.

Thirteen or fourteen of the whole number were finished and occupied at the end of the fiscal year. Twenty-two were very nearly finished. About half a dozen had very recently been commenced, and the balance were in various intermediate stages of progress.

It is interesting to note under what business arrangements these buildings have been or are being planned and erected. For instance, nineteen of the number are planned and contracted for, on the percentage basis, by persons who act as architect, engineer and builder, all in one; there being four firms in this kind of business. Eight or ten others of the buildings are planned and erected by four or five combinations, wherein it is said that the architects are in some business way connected with the builders, employed by the month or otherwise. Four or five are built by the

owners employing architects or builders by the month to plan the structure and superintend the building by day labor for them. About thirty-six to forty others bear the names of independent practicing architects who are fairly well known to the public, and seven or eight of these architects have two such buildings apiece, the balance being vouched for by a separate architect or firm to each building.

The architects most prominent before the public by reason of the notable buildings with which their names have in the past been connected, are not prominent as architects of reinforced concrete buildings. The names of not more than eight or ten such specially prominent architects appear in the list. Of these, several have two reinforced concrete buildings each, and the balance only one. Thus, the names of quite a number of the architects amongst the foremost by reason of their works in steel, stone and brick, are not found at all in the list of those who have undertaken reinforced concrete buildings thus far.

Again, we find in the list of owners of reinforced concrete buildings few or none of those who are by public repute ranked as the most extensive real estate owners and improvers of the city. Several are large owners, to be sure, but are not quite among those most noticeable by reason of the extent of their holdings, or because of reputed surplus capital for building investment.

The following is a list of the reinforced concrete buildings, built or in course of building, July 1, 1906, to July 1, 1907:

Owner.	Stories.	Dimensions.	Est. Cost.
American Biscuit Co., Battery and Broadway.	5 and Bsmt. Factory.	275x137 4th floor concreted. 5th floor forms going up.	\$250,000
Adams, Mission, near 6th.	5 and Bsmt. Warehouse.	50x160 1st floor concreted. 2nd floor forms going in.	\$91,000
American Chocolate Co., Bluxome, near 4th.	3 Warehouse.	50x120 Finished and occupied.	\$25,100
Anglo-Cal. Bank, Mission and 16th.	4 and Bsmt. Bank and Office.	60x60 Concrete complete and stripped. Finishing inside.	\$65,000
Anderson, Dr. Winslow, Sutter, near Larkin.	2 and Bsmt. Sanitorium.	50x130 Concrete complete and stripped.	\$40,000
Brandenstein, Jos., 1st and Mission.	6 and Bsmt. Lofts.	55x60 Foundations going in.	\$67,500
Backus, Mrs. S. W., Jones, near California.	2 and Bsmt. Residence.	32x78 Concrete complete and stripped. Finishing inside.	\$10,000
Balis, Helen J., 6th, near Stevenson.	3 and Bsmt. Store.	78x22 Concrete complete and stripped. Finishing inside.	\$18,500
Bernard, Mrs. N. B., Market, near Sutter.	3 and Bsmt. Mercantile.	20x76 Concrete complete and stripped.	\$19,000

Owner.	Stories.	Dimensions.	Est. Cost.
Boyd, Jean McG. Estate, California and Drumm.	8 and Bsmt. Office.	70x62 Concreting roof. 6 stories stripped.	\$135,000
Brynteson, E. J., Drumm and Commercial.	4 and Bsmt. Rooms.	75x30 Concreting second floor.	\$30,000
Bemis Bros. Bag Co., Sansome and Green.	3 and Bsmt. Warehouse.	Finished and occupied.	\$40,000
Bemis Bros. Bag Co., Sansome, near Green.	6 and Bsmt. Warehouse.	43x137 Finished and occupied.	\$35,000
Boyd Estate, Pine and Battery.	8 and Bsmt. Office.	137x46 6th floor concreted. 7th story forms going in.	\$175,000
Brandenstein, A. J., Spear and Mission.	5 and Bsmt. Store.	70x137 Concreting first floor.	\$119,000
Bothin, H. E., Mission, nr. New Montgom'y.	6 and Bsmt. Store.	40x160 3rd floor concreted. 4th floor forms and 5th story steel going in.	\$42,500
Brown, Dora C., Mission, near 6th.	7 and Bsmt. Store.	50x160 Concreting first floor.	\$35,000
Baer, Jos., Folsom, near 5th.	4 Store and rooms.	90x50 4th floor concreted.	\$23,000
Barron Estate Co., Geary and Taylor.	7 and Bsmt. Hotel.	137x137 7th floor concreted. Roof forms going in.	\$579,000
City Electric Co., Beach and Mason.	1 Power House.	137x137	\$40,000
Carpy, Chas., Montgomery and Pacific Ave.	3 and Bsmt. Office.	Finished and occupied.	\$18,750
Clarke, Mrs. Charlotte S., Turk, near Larkin.	5 and Bsmt. Apartments.	137x137 Concrete complete and stripped. Finishing inside.	\$140,000
Century Investment Co., Post, near Stockton.	6 and Bsmt. Office.	75x125 2nd floor concreted. Placing 3rd floor steel.	\$250,000
Drexler, Mrs. Elise, Market, near Mason.	7 and Bsmt. 3rd Floor in.	Awaiting owner's instructions.	\$80,000
Durbrow, A. K., Front and Commercial.	6 and Bsmt.	6th floor concreted.	\$60,000
Denman, Spear, near Mission.	2 and Bsmt.	91x30 Concreting second floor.	\$127,500
Del Monte Milling Co., Lombard and Montgomery.	2 and 3 and Bsmt. Mill.	137x137 Roof on 2-story portion. Concreting 3rd floor on 3-story portion.	\$40,000

Owner.	Stories.	Dimensions.	Est. Cost.
Freeborn Estate, Market, near Sutter.	3 and Bsmt. Store and Office.	34x100 27x120	\$38,000
Folger Estate Co., Davis, near California.	3 and Bsmt. Warehouse.	22x60 2nd floor concreted. 3rd floor forms going in.	\$50,000
Galleazzi, G., Montgomery, near Jackson.	3 and Bsmt. Store and dwelling.	22x60 Finished and occupied.	\$7000
Huber, Emma, Howard, near 2nd.	2 and Bsmt. Lofts.	25x100 Basement concreted. 1st floor forms in. Work stopped.	\$7000
Haslett Warehouse Co., Sansome and Filbert.	8 Warehouse.	82x92 3 stories concreted. 4th story forms up. Work stopped.	\$30,000
Hooker Estate Co., Battery, near Lush.	4 and Bsmt. Store.	46x97 Concrete complete and stripped. Finishing inside.	\$39,900
Halsey, N. W. & Co., California, near Sansome.	4 and Bsmt. Office and Bank.	45x125 Concrete complete and stripped. Finishing inside.	\$39,950
Hopkins, Edw. M., Pine and Leidesdorff.	7 and Bsmt. Office.	36x84 Building finished. Painting outside.	\$80,000
Jennings, Thos., Battery and Washington.	3 and Bsmt. Store and Office.	120x137 Concrete complete. Brick fire-walls building.	\$50,000
Jorgensen, E. B., Kearny and Commercial.	3 and Bsmt. Office.	26x28 Concrete complete and stripped. Finishing inside.	\$11,000
Langley & Michaels, First and Jessie.	8 and Bsmt. Warehouse.	60x130 7 stories concreted. 6 stripped. Finishing lower stories inside.	\$69,750
Legalette, Battery and Jackson.	6 and Bsmt. Warehouse.	69x137 3rd floor concreted. 4th floor forms in.	\$125,000
Land, Caroline F., Bush and Sansome.	3 and Bsmt.	97x97 2nd floor concreted. 3rd floor forms up.	\$70,000
Lietz, A., Commercial and Kearny.	4 and Bsmt. Factory.	35x56 Concrete finished. Stripping in progress.	\$25,000
Lowenberg, I., Kearny, near Post.	3 and Bsmt. Store.	22x60 Finished and occupied.	\$12,000
Latham, Emily K., Mission, near 4th.	6 and Bsmt. Warehouse.	40x160 30x160 Concrete complete. Stripping top story.	\$85,000
Marvin, S. R., Clay and Front.	7 and Bsmt. Store, Bank, etc.	59x60 3rd floor concreted. 4th floor forms in.	\$55,000

Owner.	Stories.	Dimensions.	Est. Cost.
McDonough, Kearny, near Pine.	7 and Bsmt. Store and Office.	38x86 Concrete complete. 5 stories stripped.	\$110,000
Martin Estate, Fremont and Mission.	3 and Bsmt. Foundations only.	133x130 Concreting foundations.	\$4900
McLoughlin, E., Mission, near 3rd.	6 and Bsmt. Store.	88x160 3rd floor concreted. 4th floor forms going in.	\$110,000
McDonough Estate Howard, near 4th.	2 and Bsmt. Office and Salesroom.	75x137 1st floor concreted. 2nd floor forms in.	\$40,000
Mission Savings Bank, Valencia and 16th.	Bank.	89x102 L 11x44 Excavation complete. Work stopped.	\$
Mission Bank, Julian Ave. and 16th.	2 and Bsmt. Bank and Office.	50x94 2nd floor concreted. Roof forms in.	\$35,700
McCone, Mrs. L., Sutter, near Polk.	2 and Bsmt. Store.	50x120 Finished and occupied.	\$40,000
Morgan Oyster Co., 3rd, near Brannan.	1 Business.	75x130 Finished and occupied.	\$9900
Nunziatto, L., & Son, Broadway, near Montgomery.	2 and Bsmt. Factory and Residence.	Finished and occupied.	\$15,000
Owens & Unger, Front and Broadway.	6 and Bsmt. Warehouse.	127x137 First floor concreted. Part of 1st story forms and 2nd floor in. Work stopped.	\$125,000
Olympic Club, Post, near Taylor.	Club House and Swimming Tank.	137x137 Concrete complete. Temporary building over it.	\$
Peiser, Co., 6th, near Stevenson.	3 and Bsmt. Store and rooms.	22x78 Finished and occupied.	\$22,200
Pacific Co., 4th and Market.	9 and Bsmt. Office.	195x145 Concrete complete. 7 stories stripped.	\$450,000
Phelan, Mary L., Drumm and Washington.	2 Warehouse.	59x75 Finished and occupied.	\$17,000
Pond, E. B., New Anthony and Mission.	5 and Bsmt. Office and Store.	68x187 Concreting 5th floor.	\$124,500
Pacific Cereal Co., Bay and Taylor.	4 and Bsmt. Warehouse.	48x100 4th floor concreted. Roof forms in.	\$50,000
Rosenstirn, Dr. Julius, Sutter and Hyde.	10 and Bsmt. Hotel.	117x77 4th floor concreted. 5th floor forms going in.	\$250,000
Santa Marina Co., California and Drumm.	8 and Bsmt. Store and Office.	92x137 Concreting 8th floor. 5 stories stripped.	\$430,000

Owner.	Stories.	Dimensions.	Est. Cost.
Sheldon, Mark, Co., 1st and Market.	8 and Bsmt. Store and Office.	91x137 Concreting 4th floor.	\$375,000
Scatena, L., Clay and Sansome.	3 and Bsmt. Store.	92x73 Concrete complete. 1 story stripped.	\$30,000
Schweitzer & Bauer, Sacramento, near Kearny.	3 and Bsmt. Office.	34x119 1st floor concreted. 2nd floor forms in.	\$30,000
Swett Co., Mission, near 4th.	5 and Bsmt. Factory.	160x37 3rd floor concreted. 4th floor forms going up.	\$50,000
Schiff, Mrs. Henrietta, Howard, near 6th.	3 and Bsmt. Store.	25x75 Concrete complete and stripped.	\$14,000
Shaefer, August, Howard, near 3rd.	4 and Bsmt. Store and Rooms.	40x80 Concrete complete and stripped.	\$30,000
Schilling Co., Folsom and 2nd.	2 and Bsmt. 3 and Bsmt. Factory.	Finished and occupied.	\$250,000
S. F. Gas & Electric Co., Bush, near Larkin.	1 Power House.	25x120 Finished and occupied.	\$15,000
Troy, R. P.,	1 Stores.	Finished and occupied.	\$3600
Viavi, Pine, near Grant Ave.	5 and Bsmt. Laboratory.	155x200 Concrete completed and stripped. Finishing in progress.	\$50,000
Voorman, F. J., Jackson, near Stockton.	3 and Bsmt. Rooms.	29x137 Concrete complete and stripped. Finishing inside.	\$35,000
Voorhies, Mrs. A. B., Van Ness and Fern.	7 and Bsmt. Offices.	26x84 49x84 First floor concreted. Placing 2nd floor steel.	\$95,000
Wilson, Market, near 6th.	7 and Bsmt.	170x49 Concreting 2nd floor. 2nd story forms going up.	\$80,000
West. Bank Co., Ellis and Market.	8 and Bsmt. Office.	159x93 129x93 Foundation concreted. 1st floor forms going in.	\$200,000
Wellman & Peck, East, near Pacific.	3 and Bsmt. Wholesale Store.	160x137 3 stories of N. 1/2 finished and occupied. 3rd story forms of S. 1/2 going up.	\$85,000
Western Mea: Co., Townsend and 6th.	2 Wholesale Market.	137x275 Concreting 2nd floor.	\$80,000
Younger, Mrs. Maud, Powell, near Eddy.	9 and Bsmt. Office.	1st floor concreted. Part of 2nd floor forms and steel in. Work stopped.	\$

Data for the foregoing tabulation were taken from the records of building permits in the office of the Board of Public Works and from published building notices, and have in a number of cases been verified by inquiry from architects of the several buildings. The notes as to condition or stage of progress of building have been made from special field inspection, under my own direction.

The classification or declared purpose of building evidently does not in all cases convey the full information. The dimensions in some cases do not allow for irregularities of outline. The estimated costs in a number of cases apparently are not fairly comparable with others.

The total of estimated costs noted above, is \$6,177,250, covering seventy-six buildings. The average height of these buildings is about four and one-half stories, not including basements, about 330 stories, or 397 floors, all told. The sum of their superficial areas is approximately 671,000 square feet, or about 2,800,000 square feet of floor area, covering wall and column space, but not including basement floors.

The figures are yet subject to so many corrections and are so incomplete on point of height and consequent cubic content of structures, that no attempt is now made to deduce average unit costs as estimated. The table will be republished in more complete and useful form later.

* * *

Supreme Court Decides Contractor Must Follow Architect's Specifications

AN INTERESTING decision by the Supreme Court of the State of New York has recently been announced in a suit brought by a contractor and defended on the ground of failure to obey the specifications. In the particular case in question the architect specified the use of a certain braided cotton sash cord, but the contractor substituted something else which he considered "just as good," on the ground that he had never heard of the article in question. In deciding the case the court ruled as follows:

We have set forth some specimens out of more than twenty admitted failures to comply with the specifications and at the same time have given in substance the reasons of the contractor for the omissions. The contract was not substantially performed in all respects, and there is no evidence to support the finding of the trial court that it was. There is no substantial performance when no attempt is made to comply with certain express requirements of the specifications and no excuse or explanation is given for the failure. A contract is not substantially performed by substituting for that which is expressly required, materials, methods of workmanship which, in the opinion of the contractor and his experts, are "just as good," unless the substitution relates to a matter of minor importance, is made in good faith and for sufficient reasons, and there is an adequate allowance for the difference. The owner has a right to what the contractor agreed to give him, and unless he has it, or when the failure is neither willful nor substantial, is fully compensated for the omission, there is no substantial performance and there can be no recovery. It is not sufficient for the contractor to build a house, but he must build the house contracted for, and substantially comply with the specifications as to the method of construction, materials and workmanship before he is entitled to payment.

In the case last cited, we said: "The contractor may not deliberately violate his contract by the use of earthen construction instead of iron and small pipes instead of large ones, and yet claim that he has done as he agreed be-

cause the result is just as good. Unless the owner had the right to contract for what he wanted and to get what he contracted for, there was no use in making the contract. A building contract, like any other, is to fairly perform according to its terms, and any substantial change, unless authorized by the owner or architect, is made at the risk of the contractor. In order to avoid injustice the law tolerates unsubstantial deviations made in good faith, but it exacts full compensation therefor, and permits a recovery on the theory of substantial performance only after the proper deductions have been made. The contractor had no right to substitute his own judgment for the stipulations of the contract, or to recover on the basis of complete performance, when . . . he willfully and intentionally used inferior and less expensive materials in the place of those agreed upon."

* * *

Sandstone the Poorest Building Material Available

OUR attention was called a short time since to the remains of what had once been a house dating from the Colonial period. The chimneys had been built supposedly of very excellent brick and their remains had been lying exposed to the weather throughout the whole winter and were now in such condition that hardly a single piece of burnt clay was intact. The query was raised, why brick should disintegrate, and that brought out the very commonly heard statement that our questioner assumed all bricks were alike and that almost any brick is fit to use in a building if laid up properly. It is never safe to assume that brick is enduring and suitable for building operations unless we know its composition. The most potent factor which must be guarded against is the presence of salts of magnesia. It is only a question of time when brick in which these salts are present in any appreciable quantity will be badly influenced by the weather, and we have seen brick which, when fresh from the kiln, gave every mechanical evidence of being of best quality, so shattered and disintegrated by the combined effect of moisture, frost, and the chemical action of the magnesia, that a knife could be thrust straight into the heart of the brick with very little effort. Fortunately, there is so much good clay in this country and so many thoroughly reliable brick manufacturers that there is really no excuse for bad brick ever being used, but any brick is not necessarily, therefore, good brick, and care and intelligent discretion must be used in the employment of this material as it should be used in connection with any building medium.

There is a common conception that granite is one of the most enduring stones, but it certainly is not so in our climate, and as a matter of fact most granites would be outlived by thoroughly first quality hard burned brick. A pure syenite, free from iron or mica, constitutes the most enduring of the granites. A granite quarry may have good stone in some portions of the deposit and be utterly worthless in others, and as a general rule it is not safe to use a granite unless the architect knows absolutely its composition and the part of the quarry from which it is taken.

Sandstones, which were formerly so much used in the East, are really the poorest building material in the market. The cementing material in sandstone has a very slight value, and it is probably the poorest material extensively used, as far as resisting the action of frost is concerned, while the presence of iron constitutes an almost fatal defect. It may be said also that very little sandstone is free from iron.—The Brickbuilder.

Owners Blamed for Poor Construction

Architects, as a Rule, Recommend Fireproof Materials but Increased Expense Frightens the Builder

SEVERE criticism of the lack of fireproof qualities in modern buildings is contained in the combined reports just submitted to the United States Geological Survey by Professor Frank Soule, Dean of the College of Civil Engineering in the University of California, Captain John Stephen Sewell, Engineer Corps, U. S. A., and Richard L. Humphrey, expert in charge of the Structural Materials Division of the Technologic Branch of the Geological Survey and secretary of the National Advisory Board on Fuels and Structural Materials.

These experts a short time ago completed a study of the condition of the buildings of San Francisco following the earthquake of April 18, 1906, and the fire which followed. They reached the conclusions that the lessons from the Chicago and Baltimore fires have not yet been learned and that a great conflagration with its attendant loss of life and millions of dollars in property is possible in every big city of the country.

Professor Frank Soule, after giving the details of his investigation, sums up the situation in the following language: "The failure of fireproofing methods in San Francisco is directly traceable to the commands of the owners to their architects to cheapen as far as practicable, the fireproofing and the construction generally, in order to secure greater interest on their investments. This cheapening has often occurred in spite of the protests of the designers and it is in an entirely wrong direction; for rates of insurance are largely reduced with improvements in fireproofing; and as the cost of the steel frame and its proper fireproofing seldom exceeds 27 per cent of the cost of the building, it seems wise to protect the other 73 per cent with adequate materials.

"In some instances in San Francisco, brick laid in rich Portland cement mortar has been found to be excellent fireproof covering. Good brick has withstood well the severe fire, and when laid in good cement, has afforded a strong fireproof wall or pier. At least four inches in brick was found necessary, and a layer of concrete three inches in thickness between that and the steel was a great improvement and served well to protect the latter from rust. But this method will probably not be followed in general, on account of weight, bulk and expense. Hollow brick and tiling was efficient also when properly and liberally used as well as correctly applied on a good system. It has fireproofed satisfactorily; porous tiles proving to be the better.

"In a country subject to earthquakes, a strongly-framed and well-founded wooden house, two, or at most, three stories in height, with non-disintegrating plaster and finish, light tile chimneys and ample fire prevention and protection is the ideal type of residence structure.

"The high steel-frame office buildings have shown that in order to resist perfectly the bending movements and shears induced by the swaying due to earthquake movement, such buildings should be stiffened in their joints and connections by the best riveting combinations and knee and other bracing, particularly at or near the ground floor.

"Columns, exterior and interior, should be put in more liberally in future, upon the first and second stories, and the strongest joints and connections should be adopted in order to resist the bending and shearing. With such strengthening the high steel structures will safely endure an earthquake of even greater severity than that of April 18, 1906. This

kind of building has proved its worth and reliability and has 'come to stay'. It has been tried and has not been found wanting. Minor improvements, as advocated, will produce a perfect structure.

"Concrete and reinforced concrete have become popular for construction with a large number of designers in San Francisco, on account of the claimed strength, indestructibility, facility of use, and fire and rust protection their materials afford. Unfortunately for San Francisco, there were few structures of concrete or reinforced concrete in the city at the time of her great trial; but these few behaved well during both the earthquake and the resulting fire.

"Therefore, although such structures are admittedly new and comparatively experimental on the Pacific Coast, the confidence reposed in them has already led to the designing of a number of large buildings of this type for public or business purposes.

"At present the sentiment is to limit them to a height of six or eight stories, on account of their experimental character and because of the fear that greater height would permit a reversal of stress, due to 'quake and wind force in the reinforced girders.

"Mill construction with brick will undoubtedly be utilized in many instances for a considerable time to come, but the lesson taught us should be learned, that the materials used should be first-class pressed-brick, well-wetted, and cement mortar, and that all parts should be thoroughly tied and anchored together. This rule has been found by our experience to be a most important one to follow, in all brick and stone construction, and its neglect in the past has resulted in much loss and ruin.

"The damage inflicted upon San Francisco from the direct and immediate effect of the earthquake was relatively small, being estimated at from 3 to 10 per cent only of the total loss; but the subsequent and indirect effect was to paralyze the water supply and its distributing system, start a great conflagration, render impossible its extinguishment with the means at hand, cause the death of at least 500 human beings, burn approximately \$500,000,000 worth of property, render houseless, homeless and miserable, 200,000 people, and inflict remoter damages to business, commerce and labor, only to be estimated in the future. When we can see plainly, as we may, looking backward, that nearly all of this destruction and suffering might have been prevented by wise foresight and provision, we feel that we must send a warning to all the cities of the world. Any city that disregards this warning will be guilty of a great crime.

"Of a building's entire fire damage, the risk from fire within the building is estimated, on the average, at 40 per cent, the other 60 per cent of the risk being from the exterior of the building. This risk for interior fires should be reduced to a minimum by ample provision for fire prevention. As far as practicable, the absence of combustible material should be secured.

"While the danger from exterior fires to a given building is ordinarily estimated at 60 per cent, it practically becomes 100 per cent in case of a great conflagration. In San Francisco, little protection from exterior fires has been adopted. Many of the best buildings, had they been furnished with metallic shutters of the best design, with wire-glass in metal sashes, and with cornice and other exterior sprinklers, supplied by a private water plant, certainly might have been saved.

"San Francisco's experience recommends that wells and elevator shafts, running up through many stories, should be guarded by brick or

reinforced concrete walls, fitted with double metal rolling doors, bolted to the walls to allow the expansion; or with automatic sliding doors and wire-glass partitions.

"The importance and value of real protection will be appreciated when it is stated that a third-class building, with such complete fire-prevention plant, is insured for less than a first-class one, not having it. This lesson is one that should be taught to all capitalist owners by their architects and engineers. Moreover, all parts of an establishment should be equally protected, for the fire may begin anywhere.

"Concrete floors with metallic mesh reinforcement are strongly recommended for strength and fire proof character.

"A non-inflammable substitute for wood work and trim generally is greatly to be desired.

"Double windows of wire-glass in hollow metallic frames are recommended; or where such material would be objectionable by cutting off the view, double plate glass is considered next best.

"Interior doors should be of metal, or at any rate metal covered, in fire-proof buildings and the light for corridors and halls should come through wire glass.

"As the installation of wire-glass, metallic rolling shutters and metal sash is only a small percentage of the cost of the building, and has proved to be such excellent fire protection, when of the best material and workmanship, a wise economy demands its use in every important fire-proof building. Capitalists and owners must understand that perfect fire protection for structural steel is necessarily expensive. Any so-called fire-proofing that is cheap or flimsy is a delusion and will not serve. The application of an effective method insures permanence of the structure and at the same time is a reducer of the rates of insurance.

"Steel columns may be well fireproofed by surrounding them with four inch thickness of the best quality of stone or cinder concrete, or by three inch thickness of either, when hollow tiling is put upon the exterior.

"Three-inch porous terra cotta tiling, wrapped on the outside with wire, and metal mesh used around the bed course of the column, has proved efficient. The mortar of the tiles should contain a large percentage of cement, and they should be strongly anchored to the columns to prevent their falling away in earthquake or fire and so leaving the steel exposed.

"In the great fire, decorations, trim, inflammable oil paints and varnishes, in office buildings aided materially in spreading the flames. A water color paint has been recommended that will endure washing and is non-inflammable.

"Fire walls of brick, extending up above the roofs of buildings were effective in resisting the spread of the fire; but the support derived from metal bands and anchors was often neglected, like much other masonry in San Francisco, and such walls therefore fell, in many instances, both during the earthquake and the fire, particularly when laid in common mortar.

"Cast iron columns, in many buildings, endured the 'quake and the fire quite well, but undoubtedly would have been broken or shattered had cold water been thrown upon them in the midst of the great heat.

"Structures made of concrete blocks were usually greatly damaged or even ruined by the earthquake, owing to imperfect anchorage and failure to cohere at their joints.

"Granite, sandstone and marble were badly cracked and spalled by the fire, the latter stone often crumbling to powder.

Final Conclusions

"A proper foundation, stable and firm, is of vital importance, and particularly in the case of soft, marshy or made ground. Anchorage, bonding and tying of all masonry should be strictly practiced. Steel framing should be made heavier rather than lighter, and joints, connections, bracing and flooring, should be strongly united. Girders and columns should be made very stiff, and, where practicable, continuous. Fireproofing should be of the most perfect type, and no reasonable expense should be spared in its installation.

"The lessons taught by the great fires of Boston, Chicago and Baltimore have been verified in San Francisco's experience. In addition to these lessons, the following conclusions may be drawn: (a) Roofs, roof appurtenances and skylights should be given ample protection against fires from without; (b) A great excess of fire hose and apparatus beyond ordinary needs, should be available. (c) A strong bond for fireproofing tiling, etc., both for girder and column protection is essential. (d) Protection for front windows as well as for side and rear ones, is of vital importance. (e) Good protection for steel frames and steel roof trusses in attics or the exposed or unusual places should be provided. (f) Liberal use should be made of fire retardent in windows and door transoms. (g) Wise and liberal use of concrete and reinforced concrete for girder and column fireproofing has proved itself saving quality. (h) Interior fire protection and prevention by wells, pumps, sprinklers and water tanks vastly lessen fire-risk."

Captain Sewell also places himself on record in favor of the steel frame type of construction for tall buildings, but it should be thoroughly braced.

"In my judgment," continues Captain Sewell, "to secure the best results, the steel construction should also be inclosed with walls of reinforced concrete. The proper artistic treatment of this material would seem to be a very important problem for the architects in a place like San Francisco. Its great utility in earthquake shocks cannot be denied. Where steel frame buildings are to be finished with ordinary masonry walls, however, complete bonding of all face bricks with full header courses should be absolutely required; no other form of bond is adequate. Nothing but Portland cement mortar should be allowed in any portion of the structure. The masonry should be tied to the steel frame in the very best possible way, and much more securely than is ordinarily the case.

"For buildings of moderate height, say up to 125 feet as an extreme limit, reinforced concrete alone can undoubtedly be so designed as to give very good results when subjected to either earthquake or fire. But the bracing of a reinforced concrete building of any height, to resist earthquake, is a matter for serious study. The problem can be solved, but it has not been solved as yet. Any building of considerable height in an earthquake country should have as little mass in the superstructure as possible.

"For the ordinary commercial building where brick walls and wooden joists would ordinarily be used, I am of the opinion that reinforced concrete is the safest and most practicable solution in a place like San Francisco.

"Where reinforced concrete is used throughout, whether the building is very tall or not, great care should be taken with the design and execution of the connections between columns and members of the floor system. There should be heavy knee braces for the connection of all girders and

beams, and, wherever possible, portal bracing in the shape of reinforced concrete arches should be introduced. Of course the amount of this work that needs to be done depends upon the circumstances in each individual case, such as the height of the building, its horizontal area, the kind of material, the dead weight in the upper stories, etc.

"It seems justifiable to conclude that a solid monolithic concrete structure of any sort is secure against damage in an earthquake country, unless it should happen to lie across the slip.

"The Baltimore and the San Francisco fires, as well as many other fires and fire tests, have proven conclusively that commercial methods of fireproofing are inadequate to stand any real test. In the majority of cases, the steelwork is fairly well protected, but the number of failures is sufficiently great to show that the factor of safety against fire is not by any means what it should be.

"For the protective covering itself to suffer complete destruction, or almost complete destruction, in any one fire, is in itself a failure, because, if it is brought to any such pass, the steelwork is very near destruction and the margin of safety is altogether too small.

"In my judgment, columns should be covered either with four inches of brickwork, laid in Portland cement mortar, and with all the interior space filled with concrete, or else they should be enclosed in an expanded metal basket and the entire interior filled with concrete, so that the minimum thickness of the concrete shall not, in any case, be less than four inches. Exposed flanges of girders should be protected by the equivalent of from one and one-half inches to two and a half inches of solid porous terra cotta, according to circumstances. If concrete is to be used, its thickness should be increased by about half an inch.

"The protection for low flanges should always be inclosed in a basket of expanded metal or heavy lath wire, securely anchored into the side protection of the webs. The San Francisco fire showed that, even in a hot fire, such metal mesh basket work will largely retain its tensile strength, and thus hold in position the fireproof covering inside of it, even though the latter should be shattered by expansion stresses, or otherwise. The webs of girders should be covered by four inches of brickwork or concrete, built up on the lower flanges. Girders should be completely covered from bottom to top before the floor systems are put in, so that the collapse of the latter will not expose the girder. Floor beams should have solid, protecting skewbacks, not less than one and one-half inches thick, or be covered with at least two inches of concrete. In important work, the protection of their lower flanges should also be encased in expanded metal or wire lath. The furred ceilings so much used in San Francisco are a valuable addition to the fire-resisting qualities of the floor construction, and if the furring rods were more firmly secured, the total loss here, as a rule, would be measured by the value of the plaster alone.

"Hollow tile partitions should never be less than six inches thick.

"The results at Baltimore and San Francisco did not, by any means, indicate that either hollow tile or concrete is altogether a failure or altogether a success. Both fires indicated very clearly that commercial methods of applying both materials are inadequate; both also indicated very clearly that successful results can be attained with both materials.

"A conflagration never yields comparative results, but from such results as are available, I think there is no question that the best fire-resisting material available at the present time is the right kind of burned

clay. By the right kind of burned clay is meant a good, tough, refractory clay, almost as refractory as fire clay, made into proper shapes and properly burned. Some commercial hollow tile work is made of good material, but as a rule, that is the only good thing that can be said about it. As for concrete, there can be no question that good clinker concrete, made of well-burned clinkers, Portland cement and sand is a very efficient fire-resisting material. It is better than anything else except the better types of burned clay products, but the form in which cinder concrete is commercially applied is, on the whole, no better than the flimsy hollow tile work with which it competes; in fact, it is not certain that it may not be worse.

"If a hollow tile floor, for instance, loses its lower webs, the damage is very apparent, yet in the majority of cases, the floor remains true and capable of carrying considerable loads. Very often a cinder concrete floor which is even more seriously damaged, remains true, for the reason that the fire which damaged it, also removed its superimposed load before the damage was fully accomplished. A hollow tile which comes through a fire in which its temperature has exceeded 700 or 800 degrees Fahrenheit is inevitably damaged in all cases, owing to the dehydration of the cement, though it may seem undamaged to the casual observer. This property of concrete of maintaining a good face in spite of very real and very serious damage, is likely to lead the laymen into very dangerous conclusions. Consequently, this property of concrete construction may lead to equally dangerous practice. Inasmuch as concrete is inevitably damaged to a greater or less extent by the application of a high temperature, it would seem that, in all cases where reinforced concrete floor construction is used, a furred ceiling below it should be absolutely required.

"It should be added that attic floors and roofs should be as carefully designed to resist fire as any other part of the building. This is a thing that has rarely been done, and the experience of Baltimore and San Francisco show that it is absolutely necessary.

"While there is no doubt that commercial standards of fireproofing are dangerously inadequate, the greatest trouble of all is the fact that so little attention is paid to protecting the exterior openings in a building.

"In my judgment, windows protected in the following way, even without sprinklers, might keep out the fire, even though the building were shut up and abandoned.

"Protect the outer opening with some form of rolling steel shutter, or preferably, with a shutter composed of sheets of steel sliding in very deep rebates by means of angle irons or rivets, driven so as to interlock with a bead to be placed in position after the sheet of steel is itself in position. By providing a pocket in the masonry just above the window head and making these shutters in three or four parts, overlapping and interlocking at the overlap, the whole shutter could be slid up into the wall practically out of sight. This would necessitate window openings slightly lower than those often used in commercial buildings, but the loss of light would not be very serious. Make the windows entirely of wire glass, sheet metal, or metal-covered sash, hung in metal, or metal-covered frames. On the inside of the window, use a sliding shutter, either of wood, covered with sheet metal, or else, of sheet metal such as that for the outside."

In summing up his views on the situation, Richard L. Humphrey says: "The San Francisco disaster demonstrated that the lessons from the Chicago and Baltimore fires are still unlearned. The same faults in

construction continue to be repeated. The only sure way to remedy grave defects of this character is to enact strict building laws which will compel an observance of the essentials for fireproof structures.

"Large conflagrations demonstrate that there is no such thing as a fire-proof building. To label one as such is bad practice, since it gives a false sense of security and causes a relaxing of necessary precautions.

"The lessons taught by the great calamities such as have befallen San Francisco, Baltimore and other cities, are not regarded. It is quite probable that the new San Francisco will to a large extent be a duplicate of the former city in previous defects of construction. The defects of construction which are so strongly condemned by reason of their failure are no worse than those generally practiced throughout the United States. The same defects are common and it is evident that the same results would follow an earthquake of equal intensity in another part of the country. A moment's consideration will show that the loss of life and property in New York, for example, under similar conditions, would be enormous. The damage to property in San Francisco is estimated at \$250,000,000, but this sum, large as it is, is exceeded by the total expenditures for new construction in New York.

"In three days, the tremendous area of over 2593 acres was burned, destroying entirely 490 city blocks, and in part, 32 blocks. Of this 314 acres comprised the congested district, on which there was \$250,000,000 insurance, probably representing a value of \$500,000,000.

"In the Baltimore fire 1343 buildings were destroyed, having an assessed value of \$12,908,300. In two years these burned buildings were replaced by 570 buildings, whose assessed value is \$20,000,000. These new buildings are larger than the old, and the widening of the streets has eliminated 700 building lots. It is expected that when the reconstruction within the burned district is complete, there will be less than 800 buildings, of which the assessed value will be fully \$25,000,000.

"It is therefore quite reasonable to suppose that the assessed value of the reconstructed San Francisco will be at least double that at the time of the catastrophe.

"While reinforced concrete structures were few in the zone of seismic disturbances, these stood the test in a highly satisfactory manner. Rigidity and stiffness, and a high fire resistance, which are inherent qualities of concrete, demonstrated how admirably it is suited to resist this extraordinary test.

"It is evident that in earthquake countries, water supply pipes at least should be so laid as to avoid the action of slips, settlements or ground movements of all kinds. The pipe lines should also be arranged with gates and by-passes, making it possible to cut out that portion of the system which is crippled. There should also be some means of preventing the loss of water which is occasioned by breaks in the house service pipes. The early failure of the water mains rendered the city helpless and placed it at the mercy of the flames, the fury of which for three days threatened to complete one of the greatest disasters of recent years and to obliterate one of the most beautiful cities. It was finally checked by a combined influence of a change in the direction of the wind and a wide avenue.

"For a proper earthquake-proof structure, everything—the design, the materials used, and the workmanship—must be first-class. Most of the failures resulted from bad design and poor workmanship, and in some cases, poor materials.

"The causes of the failures in San Francisco may be summarized as follows; First, dishonest design and construction, especially as regards muni-

cipal, county and state institutions. Second, an effort, on the part of those qualified to design, and advise on building construction, to meet the owners' demands and erect structures for the least possible cost, which tends to a departure from the principles of correct design; the result is a structure that will carry ordinary loads, but that fails when subjected to unusual conditions.

"While two of the five sections into which the congested value district is divided involves only a mile of conflagrating hazard within their own limits, they are badly exposed by the others in which all elements of the conflagration hazard are present to a marked degree. Not only is the hazard extreme within the congested value district, but is augmented by the presence of a compact surrounding, great height, large area, frame residence district, itself unmanageable from a fire-fighting standpoint by reason of adverse conditions introduced by topography. In fact, San Francisco has violated all Underwriters' traditions and precedent by not burning up. That it has not done so is largely due to the vigilance of the fire department, which cannot be relied upon indefinitely to stave off the inevitable.

"The destruction was greater because the fire was hotter than was the case in the Baltimore fire, due, as has been pointed out, to the inflammable surroundings and the unprotected openings, and to the unchecked sway of the flames.

"The lower webs of floor tile came off to perhaps a greater extent than in the Baltimore fire. It is said to be impossible to secure a suitable hard sawdust on the Pacific Coast, such as is required in the manufacture of the porous terra cotta tile. The tile used are, therefore, more dense and of poorer quality.

"The question of fire-proofing, however, is of one degree, being dependent on the intensity and duration of the fire. A column may be properly fire-proof for an office building but entirely insufficiently fire-proof for a warehouse; or a column which may be all right for the upper stories, may fail in the basement as in the case of the Kamm building.

"Buildings should be self-contained, protected against exterior fires and capable of fighting fire from the inside; and in earthquake countries where service is likely to fail, it is highly essential, where possible, to have an independent supply, as from an artesian well with the necessary pumps and service pipes.

"The indiscriminate dynamiting in San Francisco did more harm than good, for the reason that the concussions damaged the surrounding buildings, as in the case of the Postoffice building, where the damage was extensive.

"The conditions at San Francisco were unusual, and even had not the water supply failed, it is doubtful whether it could have been controlled for the reason that so many fires at a time would have made it impossible for the fire department to handle them efficiently, especially since there was such a large number of combustible, non-fireproof structures.

The reports of the three engineers show that, as a rule, the amount of damage to buildings in San Francisco varied according to the character of the materials and the class of workmanship. Buildings constructed of first-class materials with careful workmanship suffered much less than those constructed of poor materials with inferior workmanship. This fact should be a lesson to owners, engineers and architects in all parts of the country.

In spite of all the lessons taught by great conflagrations, it is to be deplored that a great deal of poor material and workmanship will enter

into the construction of many buildings. Some of this is due to the desires of owners who want their buildings constructed as cheaply as possible and are willing to sacrifice quality to cheapness. Much of it, however, is due to the fact that information is lacking in regard to the use of many materials of construction.

This is particularly true of concrete and reinforced concrete construction, the present rapid development of which is in its infancy, and emphasizes the great need of additional information in regard to structural materials. That the government is alive to this need is clearly shown by the work it is carrying on in its laboratories at St. Louis, Mo., where extensive tests and investigations of structural materials, principally cement, concrete and reinforced concrete are being made. The results of this work will tend to establish on a safer and more practical basis, the claims of different types and materials of construction to their respective merits.

* * *

Concrete Telegraph Poles

THE Pittsburg, Fort Wayne and Chicago Division of the Pennsylvania Railroad is experimenting with concrete poles for their telegraph service. In the fall of 1906 they erected a mile of these poles on their right of way near Maples, Indiana, in order to test them out in actual service.

They were built by Mr. Herman Tapp, contractor of Fort Wayne, at Maples, Indiana, and were hauled out on cars to the point of erection. The profile of the ground being somewhat uneven, the length of the poles were varied from twenty-five to thirty-four feet, in order to keep the tops of the poles as nearly as possible on a continuous grade. The poles were 8 inches square at the bottom, and were tapered to a 6-inch square at the top, the corners being chamfered two inches, making the pole appear octagonal above the ground.

Holes were left for the brace and cross-arm bolts and also for the steps. The reinforcement consisted of twenty-four $\frac{1}{4}$ -inch wires running the full length of the pole. The conditions under which the poles were erected were not of the best, as the work was rushed in order to have the pole line complete for the date of a certain inspection trip. Because of this fact some of the poles were moved from the point of building and were erected within five days after they had been made. Notwithstanding this hurried method of construction and the severity of the windstorms of the past winter, the poles show up at present in almost perfect condition. The alignment is of the best, and the condition of the individual poles is very good, as no check marks or other signs of failure have appeared. The poles were set four feet under the ground and were bedded in stone screenings giving a solid foundation. Although the time these poles have been in use is not sufficient to warrant any sweeping statements as to their value, yet it is a fact that the first eight months of service have certainly showed exceptional results in favor of the use of concrete for this purpose. These can probably be put in at a cost of \$8.00 per pole.

* * *

Union Rules

"Why didn't you put on the porous plaster I sent you?"

"Plaster! Dothor, I'm a mumber ov th' Hod Carriers' Union, and it's against th' rules for me to do any plasterin' except in th' reg'lar workin' hours."



Plant of the Western Art Tile Works at Tropic, Cal.

Art Tile on the Pacific Coast*

By ARTHUR J. BURDICK

FROM the mud-pits of ancient Egypt, where the captive Hebrew children fashioned rude bricks of clay and straw, to the clean, light, roomy twentieth century American factory, where are made tiles and fashioned mosaics that would make a Michael Angelo envious, is a far call. Not so great the space of time, however, as the distance in the achievement, both in the character of the products and in the methods employed.

There is so little likeness in the products of the modern factory to the rude conceptions of those early moulders of clay that it is hard to realize that the unbaked specimens dug from the ancient Egyptian fortifications are the progenitors of the exquisite architectural creations in clay turned out from the modern factory. Nevertheless such is the case.

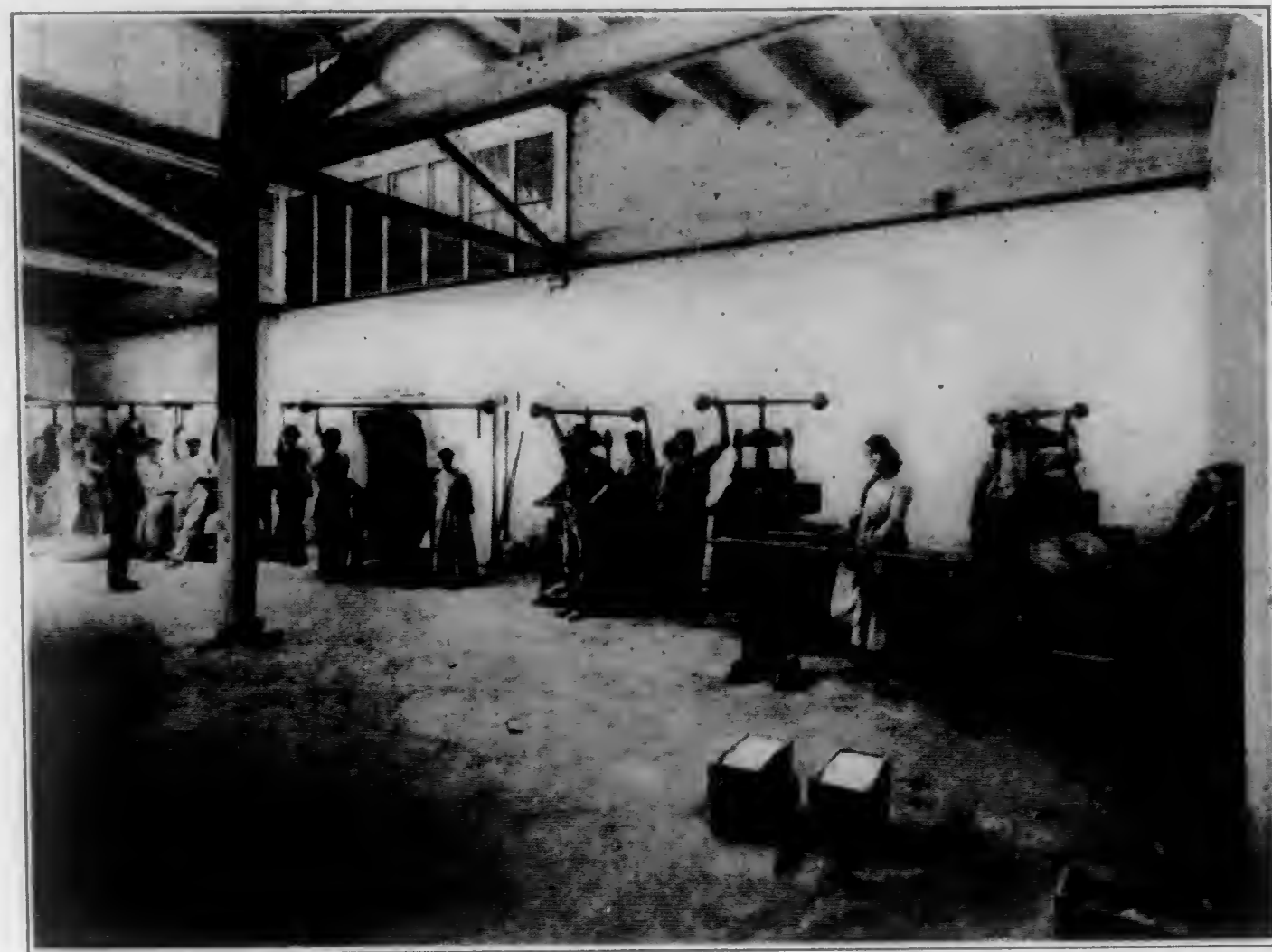
No doubt those sun-dried bricks with which the fortresses of Pithom and Rameses were constructed and of which the pyramids were built, were considered works of art in those days, though it cannot be imagined that they appealed to the aesthetic nature of even those crude builders. Possibly when a few centuries have elapsed the tiles and clay creations of today may be termed crude and devoid of artistic qualities. Who knows?

Man has been practicing nearly 4000 years since he made those first bricks of clay and straw. Possibly another 4000 years' practice will result in quite as much advancement.

It was not until the Romans came upon the scene that the baking or drying in kilns of the bricks and other clay articles came into vogue. It was under this aggressive and progressive nation that art tiles and mosaic work came into use, and the real history of clay art began.

Whenever an ancient Roman villa or town is unearthed today specimens of mosaic work are found. The floors of the atriums or open courts usually

* Reprinted from the Pacific Electric Magazine, Los Angeles.



Machines for Stamping Tiles

were paved with mosaics. As a rule cut stones or glass squares were used. In the Vatican, in Rome, are mosaics containing 25,000 different shades and tints. The designs are made of "smalts" or opaque glass, from which was cut the little squares called "tesserae."

There are in the United States but seventeen factories in which art tiles are made. There are several hundred cities and towns in which the products are used. There is but one factory west of the Rocky Mountains, and that is a mammoth concern with more than five acres of buildings at Tropic, Cal. With this single exception the most westerly factory is at Indianapolis, Indiana.

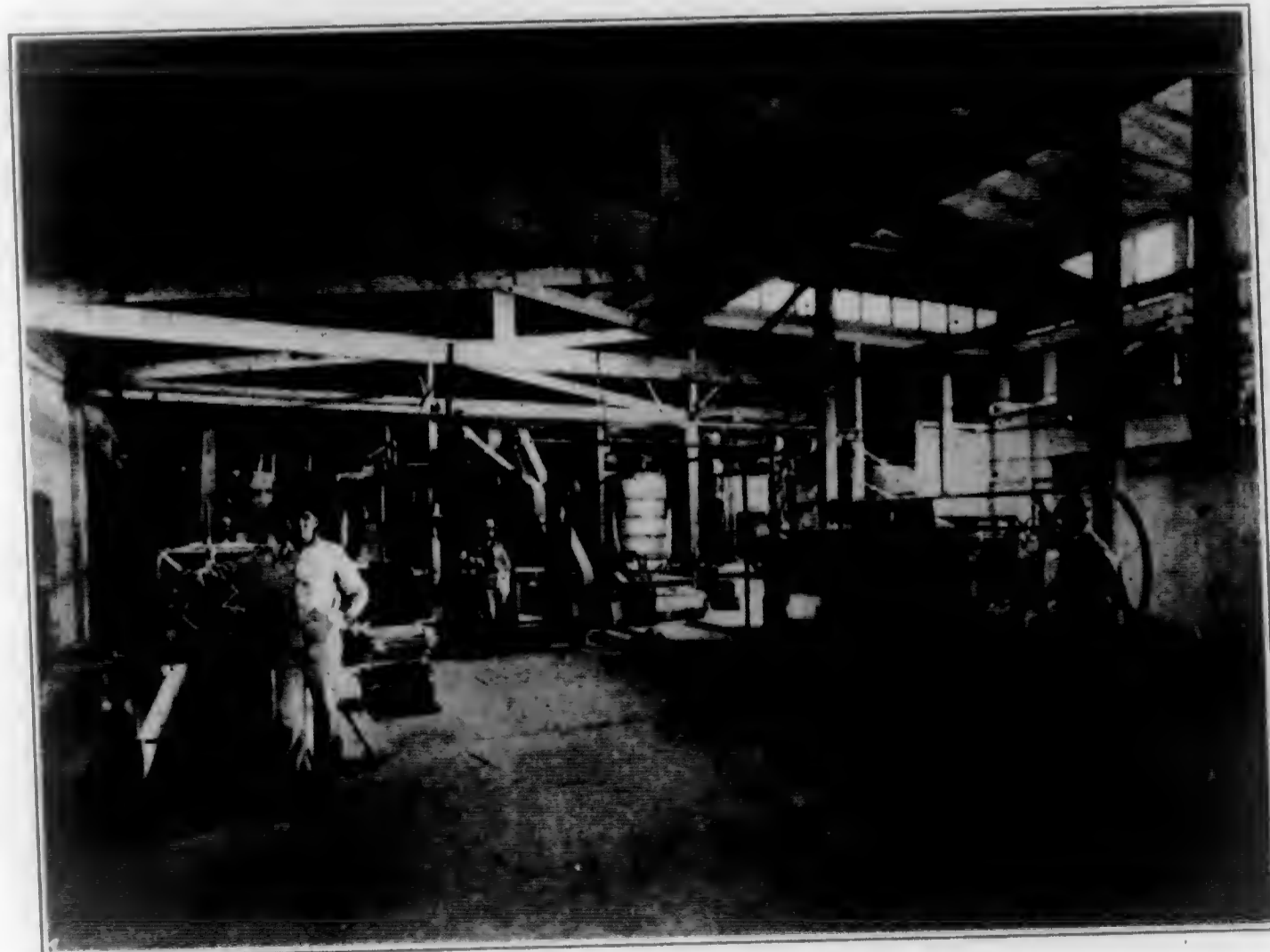
Not every kind of clay is adapted to the manufacture of art tile. In fact, there are but two localities in the United States in which clay suitable for the white tiles is found. These are in Connecticut and in Kentucky. These two States and Canada and England furnish the white clays for the factories in this country. However, the other grades of tiles have material more plentifully. In California all but the finer grades of clay are found near the factory. It is hoped and believed that the white clays may be found nearer at hand, too, for this great state, so prolific in minerals of nearly all varieties, has thus far been found to yield the things most needed at home.

One other material used in the manufacture of tiles comes from afar, also. After the tiles are pressed they are put in "saggars" or fire-clay cases, covered with sand, and packed in kilns to be burned. The sand in which these green tiles are packed comes from Belgium. It is the only kind known which will answer the purpose. This is a flinty, marble-like sand which does not melt or develop sticky qualities and it prevents the tiles from adhering to each other.

The process of tile-making is most interesting, and is more complicated than one might imagine. In the first place the clay is ground so fine that it will pass through a sieve with 120 meshes to the square inch. It then passes into vats, where it is mixed with water and kept in motion until it passes through pipes to a filter press, where it is forced by high pressure through the meshes of heavy, finely woven filter cloths which removes all but the finest of clay



The Kiln Room



The Filler Room, where Clay is Mixed

flour. The fine dust is then run over magnetized plates to remove any metallic particles which may have been introduced in passing through the machinery.

Although the clay has been several times handled and has passed through several processes it is only ready for the beginning of the making of tile. It is now in the shape of fine flour, perfectly free from moisture, and it is stored in bins ready for further processes.

Before it is ready to be made into tiles it must receive back a portion of the moisture that has been taken from it. The introduction of this moisture is one of the particular features of the business. It must be so introduced as to produce a state of dampness without any portion becoming actually wet. It must be in so minute a quantity that a handful of the flour when pressed tightly in the fist will not stick together in a mass but fall out of the hand, when released, in fine particles, as when gathered up.

The clay is now ready for the moulders. In a large room are ranged the moulding machines. Each machine represents a different shape or size of tiling. The tiny round and square pieces used in floor mosaics are moulded in groups, several at a time, but the larger tiles, the base-pieces and the cappings are moulded singly. With each machine is a deep steel mould. Above the mould is set a steel plunger which fits tightly into the mould. To this plunger is attached a weight of ten tons, which is released at will of the operator of the machine. The mould is filled by hand tightly with the prepared clay flour and the weight operating the plunger is released. It is then lifted, and from the mould is pushed a perfectly shaped tile as solid, almost, as though hewn from stone. The tile is then ready for the kiln.

As has been said, before being placed in the kiln the tiles are packed in a peculiar quality of sand in "saggars." These fire-clay boxes are then stacked in tiers in the kiln, the great doors are closed and sealed, and the fires are turned on. In the factory of the Western Art Tile Works at Tropic, oil is the fuel used. This is forced, under high pressure, through the burner in at the base of the kilns in several places, producing a terrific heat. It requires a temperature of 2380 degrees to be maintained eighty hours to properly fire the tiles. Of course this heat cannot be measured by thermometers or by any ordinary means of computing temperature. To meet the emergency a peculiar instrument has been devised. In a fire-clay base are set three chemical pencils of different heat-resisting powers. Each pencil in the row is twenty degrees removed in power from its next neighbor. Up to a certain point these pencils are unaffected by heat. When the limit of its resisting power is reached the pencil melts and lops over. These are so gauged that when the second pencil succumbs to the heat the fireman knows that the proper degree of heat has been reached and he governs himself accordingly. The instruments are introduced in the kiln in apertures left for that purpose. By opening this aperture the fireman can at any time see at a glance the state of the instrument.

At the end of the eighty hours the fires are turned off and the kiln is left to cool. It takes it three days to sufficiently cool to admit of the removing of the "saggars".

Not yet is the tile ready for the packing room. It must have its enamel, whether it be white or colored. The tile which has been produced at this stage of the process is hard as stone and porous. The enameling process is simple. The enamel is a lead and soda silicate. It is prepared and colored with whatever color, shade or tint desired and the face of the tile is dipped in the fluid. Being porous the tile immediately absorbs the moisture, leaving the solid matter in a dry condition on the surface. After being thus dipped they must again be packed in the kilns and fired to bake the enamel.

After the second time being removed from the kiln the tiles are sent to the packing room. Here the larger varieties are packed in straw in boxes or bar-



The Stock Room

rels and made ready for shipping. The tiny cubes and round lozenge-like pieces, the diamond-shaped and the other tiny geometrical shapes are then put in barrels, each shape and color by itself, or they are prepared ready for laying by working out the designs in moulds and then pasting sheets of paper over the figures. These sheets are then packed in boxes and are ready for the laying in the floors or pavements.

Not only are the enameled tiles turned out but the vitrified tiles, terret-vitrus tiles, for facings of buildings, wall tiles, terra cotta, hollow building tiles and wall partitions are manufactured as well. Tile is becoming an important factor in modern architecture. It is light as a material for walls and partitions, it is absolutely fire-proof, and it is less expensive than concrete or brick.

In the manufacture of art tiles several processes in connection with the preparation of material and the mixing and applying of colors are secret ones. Each factory has processes of its own, and each strives to outdo all other factories in artistic effects as well as in quality and durability. The result of this quality competition is that America is fast coming to the front in the quality and artisticness of its tiles. Some of the work outclasses that of the masters of the Old World, and every day sees new achievements in this line.

* * *

How McGinnes Fooled the Boss

Casey—Ye're a har-rd worruker, McGinnes. How many hods o' morthar have yez carried up that laddher th' day?

McGinnes—Whist, man—I'm foolin' th' boss. I've carried this same hodful up an' down all day, an' he thinks I'm worrukin!

* * *

A window in a Surrey hostelry, says Mr. Hamp, is completely disfigured by numberless autographs of nonentities, and in the middle of the center pane, conspicuous among the maze of signatures, is the following epigram:

"Should you ever chance to see
A man's name writ on glass
Be sure he owns a diamond
And his parents own an ass."

The Minor Chord

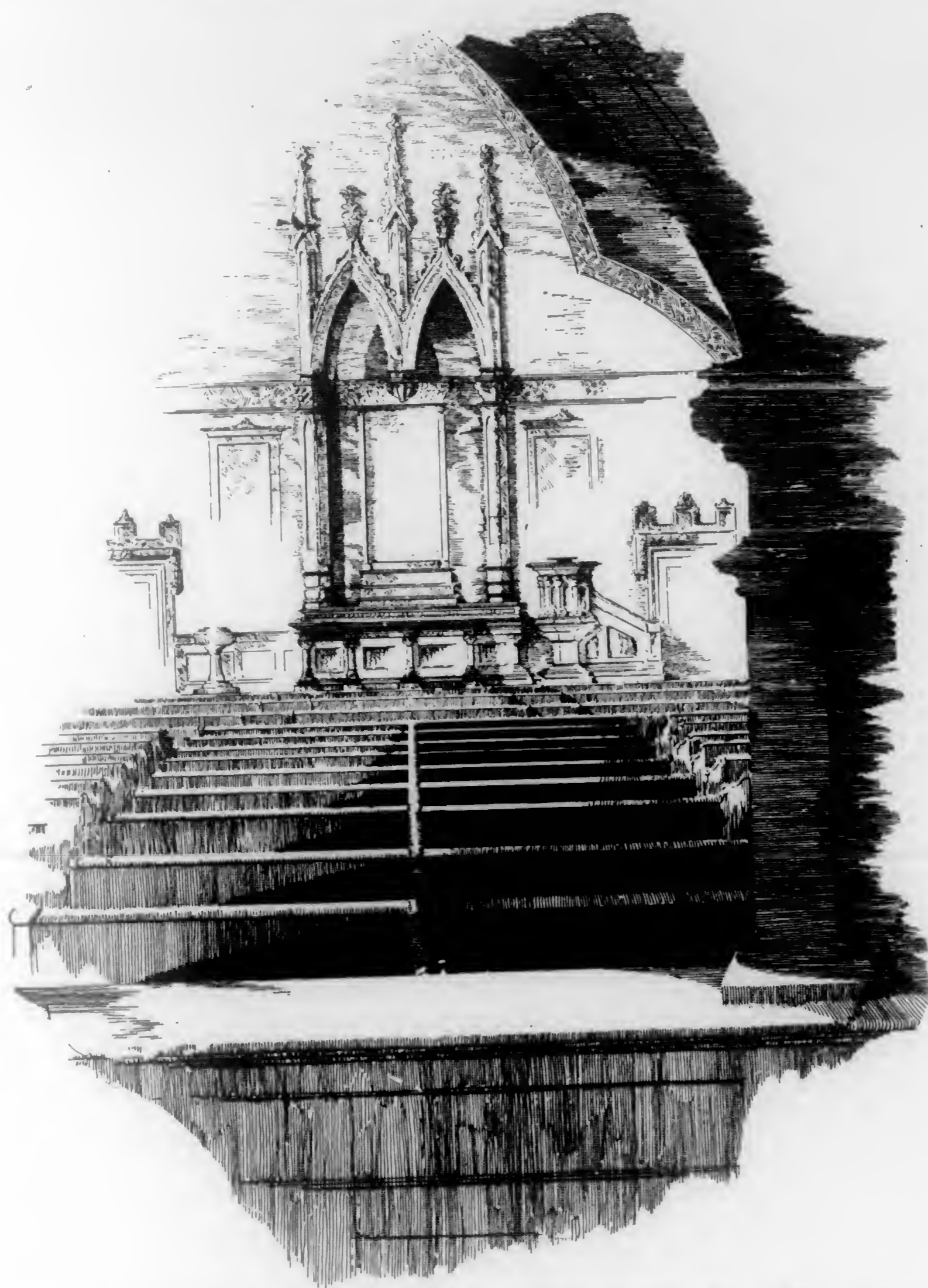
By ROBERT MORGENEIER, Architect

Detail of Interior of Zion Evangelical Lutheran Church, Oakland, Cal.
Robert Morgeneier, Architect

THE many new buildings being erected in San Francisco and the Bay cities, notably in Oakland, have so monopolized the attention of the public that the extensive work of improvements, remodeling and enlarging of structures is passed with little or no notice.

Yet some of this work, particularly when of artistic merit, deserves mention. An example is the recently remodeled interior of the Zion Evangelical Lutheran Church of Oakland. In its previous state this was one of those architecturally nondescript, bleak and cheerless edifices of an earlier period now happily past. Recent alterations have transformed the homely interior into a rare and beautiful bit of Gothic, in which two periods—the pointed and vertical—are most happily blended. The color scheme—pale antique verde and old ivory—in combination with cathedral oak seatings, produces an extremely pleasing effect.

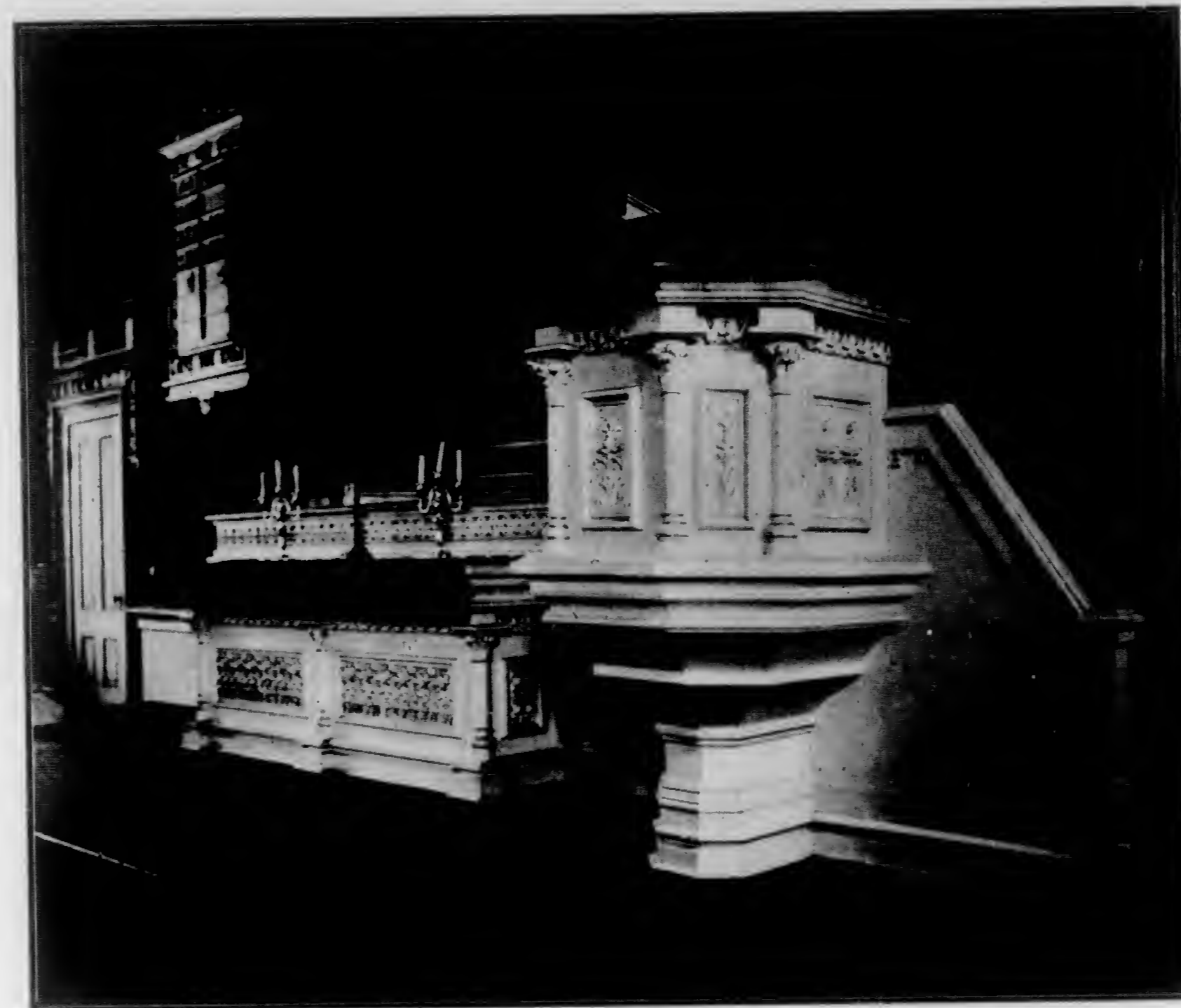
The sketch and photo-half-tones of a few of the details, give a good idea of the work.



Pen and Ink Rendering of Interior of Zion Evangelical Lutheran Church, Oakland, Cal.
Robert Morgeneier, Architect

There are three motifs for these models, viz: The bell-flower from bud to full blossom, the foliage of the oak and lily of the valley, conventionalized. The ornaments consist of capitals, pilaster caps, finials, cusps, panels, bands, belts, linings and ten different sizes and designs of Gothic mouldings.

It is to be hoped that some of the new churches to be erected shortly will be examples of pure Gothic and of such splendor that these new models will only sound the minor chord therein.



Showing Gothic Detail, Interior Zion Evangelical Lutheran Church
Robert Morgeneier, Architect

Cement Competition

Apparently brick men have little to fear from the competition of cement. Experiments with it do not demonstrate its efficiency for any but the cheapest building. For low, cheap buildings, which make no pretense of beauty, or anything beyond bare utility, cement may do. It never will do where beauty as well as utility is required, and there never was a time when beauty was more generally a part of almost every architectural scheme than it is now. Cement lends itself to some of the plainer forms of decoration. It is not possible to do anything further with it. Most architects want more or less ornament on the buildings they construct, and no material lends itself to such artistic forms at such small expense as brick and terra cotta. This point alone is sufficient to indicate the superiority of brick over cement if nothing else did; but that is only one point. There are many others equally as important.—Clayworker.

* * *

Many a young architect, who has begun his career by treating contractors if not with haughtiness at least with condescension, has found himself seriously indebted to them before long for some kindly hint or warning in matters of construction that has spared him the shame of responsibility for a disaster. It is the part of prudence to listen patiently to anything in the form of a remonstrance that comes from a contractor or intelligent mechanic, and the advice is as applicable to the relations that exist between contractors and sub-contractors as between architects and contractors.

The Folly of Fire

By F. W. FITZPATRICK, Architect

REFERRING to the appeal that was made recently to the Mayor of every city in the country by the International Society of Building Commissioners, urging the better construction of buildings and more strenuous steps toward fire-prevention, the society's executive officer, Architect Fitzpatrick, was interviewed by a representative of the Architect and Engineer of California. In lamenting the general apathy that seems to be felt toward the subject Mr. Fitzpatrick made some telling comparisons and gave some astounding data.

"In buying a suit of clothes", said he, "do you select the shoddy, cheap-looking, cotton things, that are but little better than paper and that you know will lose their color and shape after a few days' wear; or do you look for clothes of good materials, that feel wooleny, that will keep their shape and look natty ten times as long as will the cotton ones and whose initial cost is but a trifle more? If you don't know the difference between the good and the poor clothing, whose fault is it, and isn't it to your best interest to learn something about the matter without delay, or take someone with you who can advise sagely?"

"In buildings the conditions are exactly the same. It is absolutely incomprehensible why a man who lays any claim to business perspicacity will deliberately invest his money in something that is shoddy, that is ever a source of worry and expense and that stands a very great chance of being utterly destroyed, the so-called cheap building. Like the inferior suit of clothes, it is the poorest kind of investment and, adhering to the same comparison, it is certainly a sad commentary upon our intelligence that over \$400,000,000 a year are being placed in what can be called 'shoddy' construction, while probably there are millions of suits of as shoddy clothing being made to fill the 'demand' that has been created therefor by someone who profits by that demand at the sore expense of an easily beguiled public.

"The answer is made that insurance insures those buildings. It does nothing of the kind. Insurance is but a gamble the average man is trapped into and, generally, with merely the hope that the loss he feels certain may occur will not be a total one. The chance of the building's standing by reason of its insurance is actually diminished rather than improved.

"The only thing to do is to build our new buildings better and revamp the old ones just as quickly and as well as we can. Our losses have gotten to the point where they are absolutely unbearable. That is something that even the least observant of our people must realize; insurance has become almost as unbearable a tax; the cost of living, everything has ben much increased by that one factor in our commercial economics.

"Thoroughly fireproof building is the only sensible, reasonable, economical way of doing things. It ultimately means a great saving, and even the initial cost is but a trifle over that of shoddy construction. And when I say 'fireproof' I mean not only that the building should be constructed of undamageable as well as incombustible materials, but they must be properly put together and the whole designed in a 'fireproof', intelligent manner. Indeed, part of the trouble so far has been that few architects know what 'fireproof' really means. There are countless ways of finding out, but they seem not to avail themselves of the advantages, and it has now become the imperative duty of cities to protect themselves and their people against the continued destruction of life and property, in any such ratio as it has been going on, and that has been brought about by such utter stupidity and neglect of the very first essentials in safe, permanent and sensible construction."

Increasing Shortage in the Lumber Supply

MUCH concern is being manifested over the enormous consumption of timber in this country and the fact that the drain on our forests threatens to create a serious lumber famine. A conservative estimate of the present annual output of lumber, firewood and other forest products places the value at \$1,075,000,000.

According to the government Forest Service every person in the United States is using over six times as much wood as he would use if he were in Europe. The country as a whole consumes every year between three and four times more wood than all of the forests of the United States grow in the meantime. The average acre of forest lays up a store of only 10 cubic feet annually, whereas it ought to be laying up at least 30 cubic feet in order to furnish the products taken out of it. Since 1880 more than 700,000,000,000 feet of timber have been cut for lumber alone, including 80,000,000,000 feet of coniferous timber in excess of the total coniferous stumpage estimate of the Census in 1880.

This country is today in the same position with regard to forest resources as was Germany 150 years ago. During this period of 150 years such German States as Saxony and Prussia, particularly the latter, have applied a policy of government control and regulation which has immensely increased the productivity of their forests. The same policy will achieve even better results in the United States, because we have the advantage of all the lessons which Europe has learned and paid for in the course of a century of theory and practice.

Lest it might be assumed that the rapid and gaining depletion of American forest resources is sufficiently accounted for by the increase of population, it is pointed out in the circular that the increase in population since 1880 is barely more than half the increase in lumber cut in the same period. Two areas supplying timber have already reached and passed their maximum production—the Northeastern States in 1870 and the Lake States in 1890. Today the Southern States, which cut yellow pine amounting to one-third the total annual lumber cut of the country, are undoubtedly near their maximum. The Pacific States will soon take the ascendency. The State of Washington within a few years has come to the front and now ranks first of all individual states in volume of cut.

At present but one-fifth of the total forest area of the United States is embraced in National Forests. The remaining four-fifths have already passed or are most likely to pass into private hands. The average age of the trees felled for lumber this year is not less than 150 years. In other words, if he is to secure a second crop of trees of the same size, the lumberman or private forest owner must wait, say, at least one hundred years for the second crop to grow. As a rule, such long-time investments as this waiting would involve do not commend themselves to business men who are accustomed to quick returns. But the States and the Nation can look much farther ahead. The larger, then, the area of National and State control over woodlands, the greater is the likelihood that the forests of the country will be kept permanently productive.

The question of how long our timber supply will hold out at the present rate of consumption cannot, of course, be readily determined. While on these points authorities differ, there is no question as to the fact that in a comparatively few years the supply of virgin forest will be practically exhausted.

History and Development of Waterproofing

By MAXIMILIAN TOCH

THE early history of waterproofing is clouded very much in mystery, for the reason there is little or no literature on the subject, and it must therefore be taken very much on faith and information. The early history of waterproofing is very much like the question which was asked of a schoolboy: "Which is the largest city in the United States?" and to which he answered, "Chicago." The questioner thereupon said to the boy, "Who told you so?" and the boy answered, "A gentleman from Chicago."

The first successful waterproofers were the Romans, as they were the first successful manufacturers of cement, and waterproofing consisted primarily in building foundation walls which were so thick it was difficult for water to penetrate. At the time Ceasar invaded Gaul, about 2,000 years ago, the Romans found a mineral which is now known as cerusite, and this they melted and from it they obtained lead. The metal was too soft, however, for technical use, but they soon discovered on rolling it into thin sheets that it corroded only on the surface, and corrosion went no further and this sheet lead is still found today as a waterproofing material in the foundations of many of the ancient structures.

The use of sheet lead for conveying water has been found to be more suitable than other materials, for the reason that the white scum which forms does not go any further, and this is an oxide which seems to protect the lead underneath it. Where iron pipes are used for conveying water they in time rust out completely. So we have to thank the Romans for the real introduction of waterproofing on foundation walls. During the feudal times the method of protection that was practiced by the ancients was to build castles, and around these castles were built moats. These moats were huge dugouts filled with water and a drawgridge across. When the enemy approached them they drew up the bridge, and in that way isolated themselves and were invulnerable. To this day the expression exists in England "that a man's home is his castle," and it is traced to this construction.

The ancient Britains and Normans soon found that the water penetrated into the cellars or dungeons of the castles, and where these dungeons were used for prison purposes they cared not whether they were damp or dry, but they found later on that the seepage undermined the foundations, and so they were compelled to keep the water out, which in some cases they did with sheet lead, but more often with huge stones filled in with cement, and so no progress was made.

Coal tar pitch and coal tar liquid are materials which must be applied in a hot condition, and their value as waterproofing materials is in conjunction with fabric of various thicknesses running from three to ten. Bitumen is of undoubted value, but wherever there is a leaky gas main, a mixture of illuminating gas and seepage water always destroys coal tar waterproofing. It so happened that some of the stations of the subway in New York City were found to leak after they had been completed, and the water which came through the waterproofing was impregnated with illuminating gas; in order to overcome this, the speaker invented a new waterproofing fabric known under the name of Benzol Proof Cloth.

* From an address before the Chicago Architects' Association.

Quite a number of years ago, I think it was in 1879, when the Obelisk was first brought to Central Park, New York, it was found that in a very few months it began to show signs of disintegration, and Prof. R. Ogden Doremus, who was at that time a well-known chemical expert, was consulted as to the application of the material to the Obelisk for its preservation. This illustrated the remarkable difference in climate, for the Obelisk had stood perfectly for 3000 years in Egypt, and within six months after its arrival in New York the temperature changes had begun to affect it. You, gentlemen, are probably aware that on the east coast of the United States, in the vicinity of New York, there is a temperature change of 130°, and during the year our thermometer frequently goes as low as 10° below zero, and in the summer season mounts to as high as 120°. Out here I believe the temperature variation is about 145°, and this explains why some building materials, particularly cement, are not suited for this climate.

I do not wish you to infer that a large body of cement or concrete will withstand the temperature variations, but I do know that in Belgium the manufacture of cement tiles has existed successfully for over 300 years, and these tiles are not more than one inch thick, and that the manufacture of the same tiles made in this country of the same material have not withstood our climate for one year.

And so it was when Prof. Doremus was consulted on this subject of waterproofing of the Obelisk against the ravages of the elements, he concluded that the application of hot paraffine would be the proper method. This was done, and, although this was over 25 years ago, no second application of hot paraffine has ever been applied to the Obelisk, and I know that the monolith has been perfectly preserved since then. This hot paraffine method is the outcome of what is known as the "Caffall Process," and I understand it is excellent, excepting for the lighter stones, on which it unfortunately acts as a dust and dirt collector. There are a number of other cement and stone waterproofing materials on the market which are solutions of paraffine, some of which were examined and found to contain a very small percentage of low-melting-point paraffine, and these are to be avoided, for they are only temporary materials, worth but a few cents per gallon, and sold at prices beyond their real value.

Another material which has been successfully used in Europe is the invention of Prof. Hauenschild, in conjunction with Kessler, and these chemists invented Fluosilicate of magnesia, known technically under the name of Fluote. The Paris Opera House, the Kaiser's Palace in Potsdam, and a great many other buildings in Europe were all treated with this material, and it serves an excellent purpose, for it hardens stone and makes it rain proof at the same time, but this beneficial effect is not instantaneous, for it takes more than a year to demonstrate itself.

About 16 years ago, when fireproof construction became quite prominent in New York City, and the question of taking away the air space had to be solved, my firm invented a material which when applied to the inside of outside walls, either over brick construction or hollow brick, would retain the plaster, do away with the air space and prevent moisture from coming through. A material of this kind could not, of course, contain any tar, for the reason any tar material would stain the plaster on the inner surface of the room. It had to be alkali proof, so that the lime in the cement and in the brown coat should not affect it, and yet I have the most remarkable story to tell in connection with this—that it took our concern over five years to educate the architects and builders to the use

of it against most insurmountable odds. Today no prominent building is erected without the use of some of this material somewhere, and one of the largest buildings I know of in New York, which has cost up to \$10,000,000, has this Damp-Resisting Paint applied on the walls, back on the ceilings, and under the floors. It took so long to educate the public in the use of this material that the time for its patent had elapsed, and now it is unfortunate that similar materials have imitated it, and to my knowledge no less than 12 substitutes appeared on the market, and then gradually disappeared as the material failed.

Its use as a waterproofing material and insulating material in cold storage building has made it many friends, for the immovable air in the air space and absolute freedom of odor and taint of the material has much to do with the success of the cold storage plant.

* * *

Hollow Tile For Country Homes

THE artistic country home, safe from destruction by fire and costing little more than inflammable structures of wood, is the latest development in modern building. It has now become possible to erect an inexpensive home of materials which will not only eliminate danger from fire, but will increase the durability of the structure and lessen the disbursements for repairs and depreciation.

The era of the fireproof home has now arrived, for the country as well as the city, for the wealthy as well as the man of moderate means. In about the same proportion as the price of lumber has increased the cost of fireproofing has decreased, owing to improved methods of manufacture and distribution, and the use of the latter now involves an outlay but little larger than that incurred in former years when burnable material was used. A row of houses recently erected in Pittsburg cost \$4,500 each. Open bids were made for their construction before the contracts were let, and the lowest of these, for wood in place of hollow-tile, was \$4,000. A fireproof house erected in Washington cost \$5,186, while one bid for the old-fashioned wood frame was \$5,875—a difference of \$669 in favor of the former.

The man who wants a country home which will afford better protection against the elements than the frame house, however well built, can possibly provide—a home that will be outwardly attractive as well as inwardly comfortable in all kinds of weather—is beginning to investigate the cost and efficiency of various fireproofing materials which can be used for its construction. The result is that terra cotta hollow-tile blocks are now generally used for walls, floors and partitions in place of brick or wood. These blocks being made of hard burnt clay cannot be destroyed by fire. The theory in using them is to divide the whole structure into a series of fireproof units, similar to the bulkheads of a battleship, so that when fire occurs it may be confined to the area in which it starts.

Another advantage in the use of these blocks is that each contains a non-conductive air-space, which makes the building in which they are used warmer in winter, cooler in summer, and sound-proof.

In addition to all these advantages, a country house can be built of fireproof materials without sacrificing desired architectural features. Fireproof terra-cotta materials are molded in all sorts of forms and shapes, so that the design of the owner may be closely followed. Houses already built in this way show that the artistic effect is as beautiful in such structures as though they were built of wood.

The Decorations of the Colony Club

By C. WALTER TOZER

ONE of the most talked of club buildings, and one which has been written about in nearly all the magazines of late, is that of the Colony Club, at 120 Madison avenue, New York. It is one of the most interesting club buildings in that city of wonderful buildings, and is the only club house there designed exclusively for women.

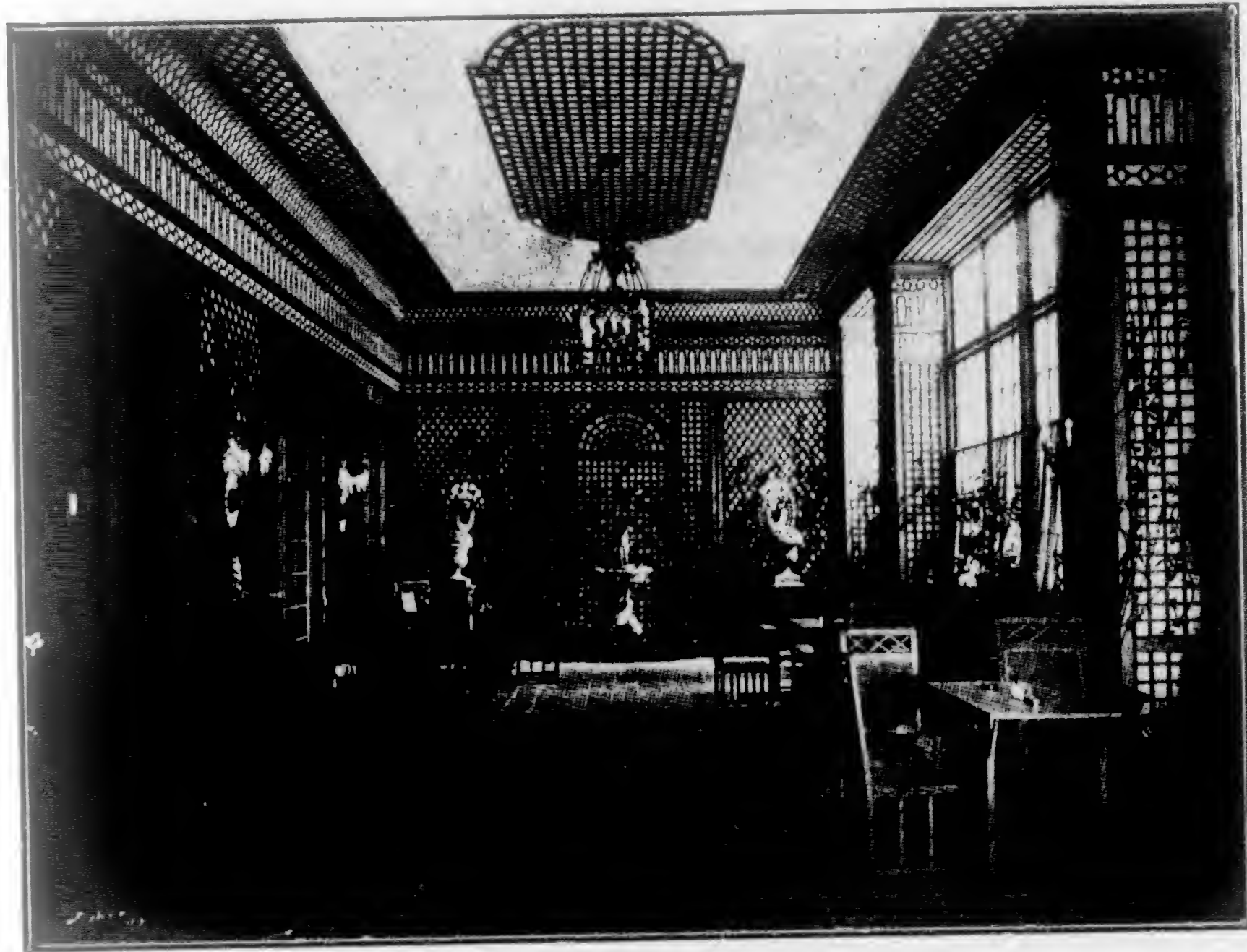
The Colony Club is essentially American in both its purpose and its methods, and is an organization for women on exactly the same lines as those which govern men's clubs. Besides being a social organization, it is a literary and athletic club as well. Its membership includes practically all the women of social prominence about New York, as well as the leading women authors, actresses, musicians and artists, both in New York and elsewhere. It is founded upon a basis very much broader than any man's club, but follows quite closely the main ideas of our own Bohemian Club.

The building was one of the last designed by the late Stanford White, of McKim, Mead and White, and he considered it one of his best pieces of work. And yet he has the buildings of the Metropolitan Club (the millionaires' club), the University Club and the Harvard Club of New York, standing as wonderful monuments to his architectural genius.

The Colony Club has a building, in conformity to its name, essentially Colonial in style, six stories high, with two of the floors mezzanine. Although Colonial, it has many striking and original features. It is constructed of dull red Colonial brick with white columns running from the base, supporting a balcony the width of the building. It is lavishly yet tastefully decorated and furnished. This work was under the direction of a lady decorator, Miss Elsie De Wolfe, a sister of E. S. De Wolfe of San Francisco, formerly manager of the Hotel Pleasanton, now manager of the Majestic Hotel and the Bellevue Hotel at present building. Miss De Wolfe is better known to us on the Pacific Coast as a popular actress, than as a decorator. She gave up the stage, however, a few years ago and decided to take up the art of interior decoration. Since taking up this work she has decorated a number of the homes of wealthy New Yorkers, including those of Whitney and Vanderbilt. She is responsible for the Colony Club's entire scheme of decoration. The color schemes of white and green, French gray and gold, and the Colonial buff and blue, were all selected by her. For the past two summers Miss De Wolfe has been abroad, collecting and discovering furniture and furnishings for the club. In fact she spends her summers at her beautiful ville just out of Paris.

The main entrance in the center of the building opens into a large central hall containing a great stone fireplace and heavy mahogany furniture. This hall contains the office and leads into the reception-room, reading-room, card-room, tea-room and library. The ground floor also contains the palm or trellis room, which is a unique feature of interior decoration in this country, and one of the best rooms of the building. The walls are made of diamond-shaped trellises, covered with twining ivy, while the floor is tiled, with a marble fountain in the centre, having real flowers growing around a marble cupid. Colonial green is the color scheme of this room and it has a most delightful summer atmosphere. The colors in the hall are white and green. The other rooms on the main floor are all well decorated and attractive, with oddly placed window seats and alcoves, some of which open out upon verandas. The prevailing style in the interiors is that of the Adam period.

The floor beneath this is given mainly to things pertaining to the physical side of life. One will find here installed the most approved systems of Turkish, Russian, electric and all other kinds of baths. There are also massage, mani-



Colony Club Reading Room and Trellis Room



Colony Club Tea Room and Assembly Room

cure and hair-dressing rooms, in connection with the baths. The swimming pool is the most attractive feature of this floor. It is twenty-two by sixty feet and is graded in depth from four to twelve feet, so that the novice at swimming and the aquatic expert alike may enjoy its privileges. The walls of this room are set entirely with mirrors, and the ceiling is hung with vines and clusters of grapes.

On passing to the second floor, one finds it mainly devoted to the reception room, which is two stories in height. The room can readily be arranged for dances, receptions or theatricals, while the balcony provides a convenient place for the orchestra. It has a vaulted roof with novel lighting effects, consisting of clusters of lights representing eagles hung from the ceiling. The coats of arms of the club are on each of the panelled walls. Its color scheme is French gray and gold, with deep red velours hangings and elegant furniture. The balance of the second floor is devoted to the gymnasium and squash courts, also two stories in height. In the gymnasium will be found all the most modern athletic appliances, also a basket ball court and a graded running track.

The fourth floor contains ten bedrooms, naturally following feminine tastes, but most charming for their simplicity and comfort. For the most part they are decorated in shades of pink and white and green and white. Large flowered wall papers and chintz curtains are conspicuous. The furniture is Colonial, with its spindle-legged chairs and tables and beds with mahogany bedposts.

* * *

Most Expensive Wall Paper

WHAT is believed to be the most expensively papered room in the world is an apartment in the residence of Charles Whitfield King, of Ipswich, England. It is papered with unused postage stamps with a face value of \$4000 and an actual commercial value of about \$25,000.

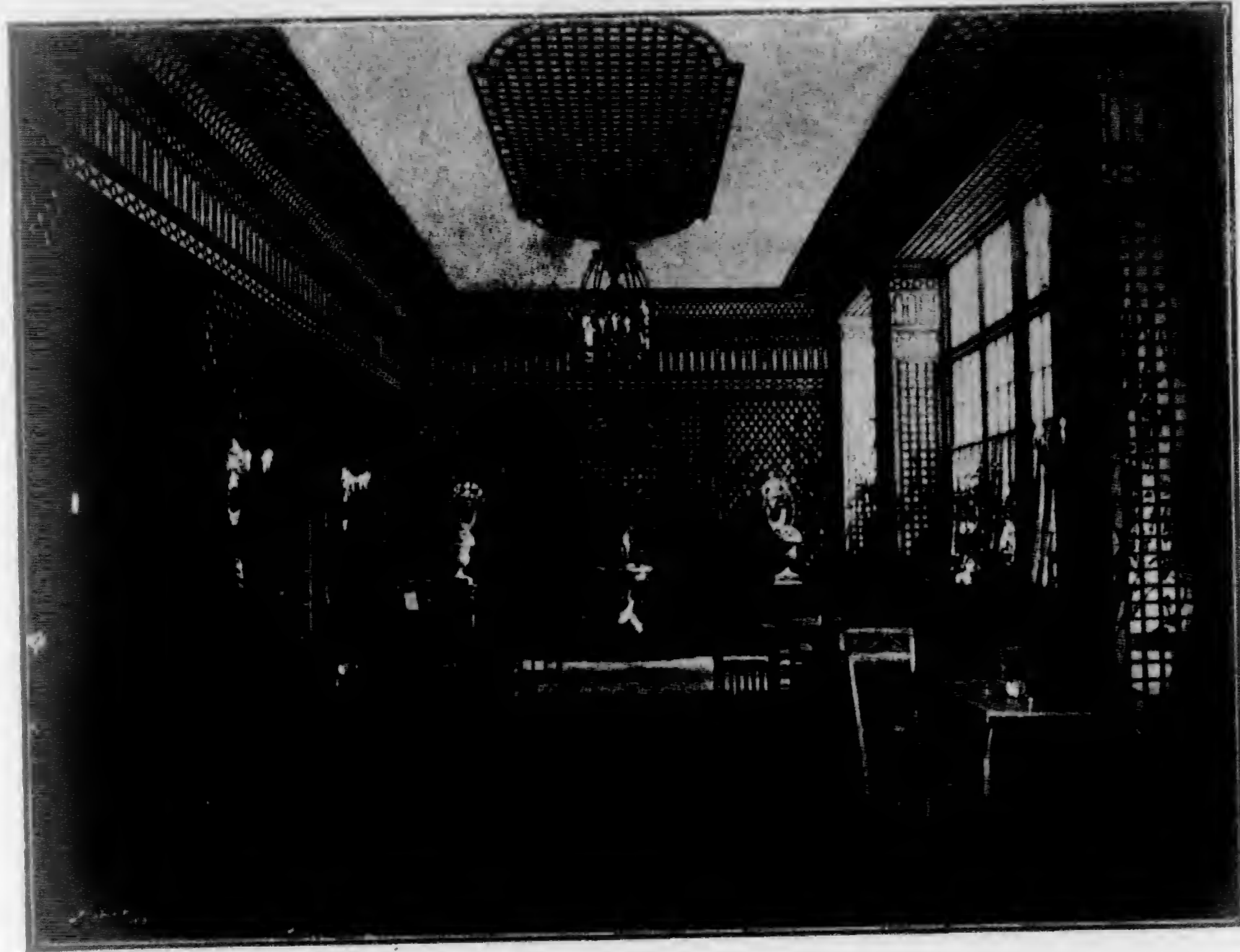
Mr. King is a dealer in postage stamps at Ipswich, having begun to collect stamps when but a lad thirteen years old. His business has grown to such proportions that it is declared he is able from his stock of 300,000,000 to supply at a single order twenty tons of stamps.

For many years Mr. King devoted considerable time to the culture of orchids, having at one time over 1500 rare specimens. Then he turned his attention to calla lilies, crossing many species and developing some most wonderful varieties.

It is in his country home, "Morpeth," that his most unique conception in the form of a room papered with unused postage stamps is to be found. China covered with stamps and rooms papered with used stamps are not unknown, although quite rare, but Mr. King's library is the only apartment on earth decorated with stamps never used for postage.

The room is about fifteen feet square and of the usual height. The stamps extend from floor to ceiling, forming even the border. The work of transferring the stamps to the walls occupied the time of an expert decorator eleven hours each day for nearly 100 days. Approximately 50,000 stamps were used, there being forty-eight varieties and many denominations. The stamps were not merely stuck on the walls in blocks or strips with only the purpose in view of covering up the white walls, but according to plans and designs worked out by Mr. King, were arranged with a view to producing an artistic and pleasing effect.

Most beautiful and elaborate designs of an imitation mosaic have been produced by the employment of stamps of certain colors, which, remembering



Colony Club Reading Room and Trellis Room



Colony Club Tea Room and Assembly Room

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Most beautiful and elaborate designs of an imitation mosaic have been produced by the employment of stamps of certain colors, which, remembering

the fineness of the designs and engravings and the delicacy of the shadings, have produced a result exquisitely beyond the power of words to adequately portray.

Some idea of the beauty of a wall wrought in bright stamps, each a type of the highest skill of the engraver, may be obtained by an inspection of the frames showing samples of stamps and United States paper money in the Treasury building in Washington. These two frames are divided into panels produced by the arrangement of revenue and postage stamps fresh from the Bureau of Engraving and Printing.

The stamps used by Mr. King in the decoration of his library were from the Argentine Republic, Samoa, Bergedorf, Lubeck, Hanover, Servia, Cuba, Roman States, Philippines, Alsace and Lorraine, and the United Kingdom. Of the famous stamps of the Roman States, with the crossed keys and tiara, emblematic of the authority of the Pope of Rome, which are of wonderfully brilliant coloring, no less than 13,000 copies were used.

The actual face value of the stamps, \$4000, represents only a fraction of the commercial value of the stamps. Many of them are worth ten times their face value, having become rare since they were pasted on the walls fourteen years ago, and it is conservatively estimated that the stamps on the walls, if removed and placed in saleable condition, would net the owner the tidy sum of \$25,000. If Mr. King would weary of his costly decorations, and desire to convert his expensive wall-paper into cash, he would find himself possessed of a comfortable fortune by reason of the fact that his "philatelic" treasures have been where he could not sell them. Thus is presented the curious spectacle of the most beautifully decorated room in the world adding annually to the wealth of the owner through the increasing rarity of the paper of which the decorations are composed.

This is, perhaps, no more surprising than the statement of stamp collectors that a person may accumulate a collection of stamps during the year 1907, lay it away and forget it, and in 1915, and probably in 1912, it will have doubled in value; in fact, it is not infrequent for stamps to quadruple in value in a single year, and a decline in value is almost unheard of. A shrewd financier of New York who has followed stamp collecting as a recreation since boyhood, declares that stamps are a better investment, to say nothing of the pleasure of collecting, than diamonds of equal value.—Wall Paper News and Interior Decorator.

* * *

Legal Distinction Between Flat and Apartment House

In these days of the popularity of flat buildings a judicial construction of the distinction between a flat and an apartment will be of interest. The question was brought before the supreme court of New Jersey in the case of Lignon vs. Jaekle, 65 Atlantic Reporter, 221. The court says that a flat or flat-house is a building consisting of more than one story, in which there are one or more suites of rooms on each floor, equipped for private house-keeping purposes. An apartment house is either a building otherwise termed a "flat," or it is a building divided into separate suites of rooms intended for residence, but commonly without facilities for cooking. It was contended that the proper distinction depended upon the amount of rent which was paid. The court concedes the possibility of this, but holds that the payment of \$40 a month rent will not convert a flat into an apartment.

Among the Architects

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Adams Cram, Boston, Mass.
For One Year—W. A. Boring, New York;
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Next Convention at Chicago, Illinois

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Southern California Chapter.

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Architectural League of America.

At the Executive Board meeting of the Architectural League of America held in Toronto on June 19th, the permanent headquarters of the Architectural League were established at 729 15th street N. W., Washington, D. C., and Mr. H. S. McAllister, the ex-secretary of the Washington Architectural Club and now vice-president of the same, was appointed permanent secretary of the League. The Executive Board wishes to announce that all communications with the League may henceforth be directed to Mr. McAllister at the above address.

San Francisco Building Record Since the Fire

The building operations in San Francisco for the past six months shows how active the building market was the first part of the year and to what extent the labor troubles have interfered with operations during May and June. Some reduction has been made in the cost of many materials in the last sixty days. It is hoped that labor will see its way clear to make corresponding concessions, which would induce many to build who have postponed indefinitely the erection of improvements.

The following table shows the building operations from month to month since the fire:

	Amount.
1906.	
April	\$ 817,084
May	621,054
June	687,391
July	1,959,290
August	5,640,508
September	5,341,106
October	6,836,331
November	5,733,985
December	4,140,984
1907.	
January	5,225,264
February	4,355,513
March	5,173,905
April	6,556,007
May	4,381,431
June	3,937,589
Total since the fire.....	\$62,407,442

Plans Accepted for Berkeley City Hall

Architects Bakewell & Brown of 1860 Webster street, San Francisco, have had their plans accepted for the new Berkeley City Hall. The plans were submitted in competition with about a dozen sets from various architects in the State. The estimated cost of the building is \$100,000. Bids are to be called for at once and the plans may be seen at the offices of Bakewell & Brown and the Town Trustees.

New Wage Scale for San Francisco Building Trades

Committees from the Builders Exchange, Builders' Association and Real Estate Association have agreed upon a new scale of wages which, if accepted by the Building Trades Council, will result in a reduction of wages for every line of labor engaged in the construction of buildings in San Francisco.

A general cut all along the line of the building trades was urged by the Builders' Exchange, the greater amounts being in the plastering, lathing, plumbing and bricklaying branches. In support of the demand for reduction it was urged that the high wages will eventually bring all building to a standstill. It was pointed out that over \$185,000,000 of insurance money has been paid out and that building operations are now at a stage where it is imperative to procure outside capital to carry on the work. Failure to secure the necessary capital will mean untold misery to the very people least able to be idle. The builders claim that the country has been scoured, through the banks, for money to build on gilt-edged property, but capital has been timid owing to unsettled conditions in San Francisco. The adoption of the wage schedule proposed by them for a period of three years would insure the entrance of outside money.

Discussing the conditions as they are at present, it has been shown that rents and the cost of living are on the decline, and that the high wages asked by the members of the building unions would be unfair, in view of the decreasing cost of living. It is also pointed out that building supplies are undergoing a reduction in price, in accompaniment with other materials.

Thirty-four thousand men, represented by McCarthy and O. A. Tveitmoe, will face lock-out if some solution of the difficulty is not reached.

End of Stone Strike in Sight

Architect Willis Polk, with D. H. Burnham & Co., has recently returned from Chicago, where he went to consult with Mr. Burnham relative to the construction of several buildings which the Burnham architects have designed for the new San Francisco. These include the First National Bank building, the reconstruction of the Mills building and the addition of three more stories to the latter.

Mr. Polk brings the welcome information that the strike of the stone workers in San Francisco is likely to be settled within a few days after the arrival of the chief of that order. This strike has been most unfortunate, as it has seriously delayed the completion of several large buildings and is so serious that

unless a compromise is arrived at some of the handsomest structure in the city, like the Bank of Italy, which was to have been of stone, will be finished in brick. There is, however, every reason to believe that a settlement will be made of the differences between the stone workers and the bosses and work resumed on the several large buildings which are now at a standstill.

Los Angeles Chapter, A. I. A.

The regular monthly dinner and business meeting of Southern California Chapter of the American Institute of Architects was held Tuesday evening, July 9th, at the Bristol Pier Cafe, Ocean Park.

A special car was chartered for the exclusive use of the members in attendance. After partaking of a sumptuous repast, the members were called to order by President Alfred F. Rosenheim. The first order of business was the signing of the Articles of Incorporation by the attending members. The minutes of the last regular meetings and of several special meetings were read by Secretary Fernand Parmentier, and approved. Treasurer August Wackerbarth made a verbal report of the financial standing of the Chapter.

A special committee consisting of R. B. Young, Theo. A. Eisen and President Rosenheim, appointed to draft proposed changes to the city building ordinance, failed to present a satisfactory report. R. B. Young read a proposed amendment to Sec. 13, Building Ordinance No. 12,800, New Series, dealing with the use of hollow tile in Class B and C structures, the gist of which was allowing the use of hollow terra cotta in lieu of wood for bearing partitions, and also the use of hollow tile wherever wood is used. Theo. A. Eisen also spoke on the advisability of the use of hollow tile in buildings of any description where masonry is employed. Architects Octavius Morgan, John P. Krempel, Charles F. Whittlesey and Julius W. Krause also commented briefly on the subject. No definite action was taken in the matter, the committee being instructed to present a majority report at the next regular meeting. The meeting then adjourned.

Those in attendance were: A. F. Rosenheim, Fernand Parmentier, Harrison Albright, Robt. F. Train, Theo. A. Eisen, Thomas Preston, Timothy Walsh, J. E. Preston, R. B. Young, Julius W. Krause, S. Tilden Norton, Chas. F. Whittlesey, A. Wesley Eager, Octavius Morgan, John P. Krempel, J. Lee Burton, P. W. Ehlers, Frederick L. Roehrig, C. H. Brown, Norman St. Claire, R. E. Williams, E. C. Kent and August Wackerbarth of Los Angeles and Joseph J. Blick, Charles A. Greene and Henry M. Greene of Pasadena.

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Architects May Not Get Their Fees

It is reported that San Francisco's new Mayor may refuse to sign, on the ground that they are excessive, demands drawn in favor of seven architects for the aggregate sum of \$31,617.25 for drawing the plans of several school-houses to be constructed under the bond issue.

The Board of Supervisors has passed to print the authorization for the payment of the demands. The resolution does not explain in detail the nature of the work done by the architects, but simply makes the designation "architectural services." The favored architects who were appointed by the Board of Supervisors and who charged three per cent of the total cost of the buildings for their "architectural services" and the amounts of their claims are as follows:

W. D. Shea, \$8820; D. D. Kearns, \$12,670; O'Brien & Werner, \$1295; G. E. McCrea, \$2677; A. M. Edelman, \$3570; E. S. Lemme, \$1293.75; Oscar Haupt, \$1291.50.

Shea resigned as city architect two years ago in order to secure as supervising architect fees of three per cent on the cost of public buildings instead of the meager \$5000 a year that he received in his permanent position. It was estimated that Shea would receive more than \$100,000 as compensation for supervising the plans of city buildings, including the new County Hospital, which is to cost \$1,000,000, and new schools for which \$2,000,000 has been provided.

It is stated that the architects will have to specify exactly what work they did and they will have to show, too, that they did more than prepare blue prints.

New Architectural Firm.

E. A. Schumacher, architect, has severed partnership with William Binder of San Jose and is now associated with R. H. White, with offices in the Grant Building, San Francisco. Mr. Binder has moved from the Theater building, San Jose, to the Rea building. Some of the more important work which Schumacher & White have in hand are the Salinas City Hall, to cost \$40,000, and the Salinas City Bank, which will represent an expenditure of \$60,000.

In New Offices

Architects Stone & Smith, well-known designers of school houses and business colleges, have moved from the Midway building on Market street, to more pretentious quarters at 404 Kearny street, corner of Pine. These architects have been active in the rebuilding of San Francisco and some very creditable work has been turned out from their office.

New State Buildings

The following is a list of appropriations made by the last State Legislature for the erection of new buildings, reconstruction of those damaged by the great earthquake of last year and for equipment, etc. Plans for the proposed work are now in the hands of the State architect at his office in Sacramento, and bids will be called for as soon as the plans are perfected. All appropriations date from July 1, 1907.

Industrial Home for Adult Blind, Oakland, dormitory building, \$50,000; repairs, \$1899.33.

Agnew State Hospital, new buildings, etc., \$800,000.

California Polytechnic School, San Luis Obispo, dormitories, \$25,000; shops and furnishings, \$20,000; two cottages, \$5000; creamery building, \$12,000; tool house, \$2000.

Lick Observatory at Mount Hamilton, barn, \$1621.

Napa State Hospital, reservoir and dam, \$51,000.

San Diego Normal School, building and equipment, \$40,000; repairs and additional equipment, \$5000.

San Francisco Normal School, completion of building, \$8500; equipment, \$5000.

San Jose Normal School, new buildings, reconstruction and grounds, \$250,000.

Southern California State Hospital, dairy barn and equipment, \$12,000; two cottages and bath house and equipment, \$43,000; slate roofing, \$16,000; storm channels, cement and stone ditches, \$15,000.

Salinas Contractor Busy

W. E. Greene, the Salinas contractor, has been given the contract for the erection of the new Salinas City Bank, to cost \$63,000. Mr. Greene is to have general oversight of all the work. He has also taken the contract for building the Church of the Sacred Heart, Salinas, from plans by McGinnis, Walsh & Sullivan, of Los Angeles.

San Francisco Architectural Club

The San Francisco Architectural Club announces that a class in structural design of buildings of all classes and materials was organized July 29, 1907, under the instruction of Benj. E. Winslow, M. W. S. E. The class will meet at the club rooms once a week. The nature of the subjects taught is such that it will not be possible to join the class after the first lessons have been given. Special arrangements will be made for non-members. The club rooms are at 568 Golden Gate avenue.

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Vol. IX. JULY, 1907 No. 3

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The International Society of Building Commissioners has kept most careful tab on the fires of the past year and in a recent bulletin makes the statement that 44% of all the fire losses of the year are directly attributable to the lack of proper window protection! Fire originates in one building but cannot be confined there, and its travel is made easy via the window route to every building in the neighborhood. Further, 80% of all the damage done in buildings in which fire did not have its origin is fault of insufficient window protection. In a conflagration like that of San Francisco nearly 100% of the damage is directly attributable to that same cause, for in that case we know of but fourteen separate and distinct fires occurring in the city on that memorable morning. Had the adjacent buildings been made invulnerable by protected windows those fires would have been confined in the structures in which they had their inception and would have resulted in but insignificant blazes. Surely is this matter of properly protecting windows an important one! Shutters and the usual automatic closing affairs constitute but make-shift protection at best; the one assured and universally approved system of window protection is a metal or incombustible sash filled with wire glass, and where the danger is particularly great, on narrow alleys, etc., there should be two thicknesses of wire glass.

The International Society finds also that 78% of all the damage done in buildings where fire originated was caused by open stairways and elevators permitting the rapid spread of fire throughout every part of the structure. New buildings should be equipped with brick or hollow tile fireproof enclosures, and where these may be difficult to place about elevators and stairs in old buildings then light iron frames and wire glass enclosures can be so placed at little cost and affording splendid protection.

The recent competition promoted by the Association of American Portland Cement Manufacturers developed some curious facts. The competition was divided into six classes which included single and double houses, ranging in cost from \$2000 to \$4500. The total number of designs submitted was 208. Over three-fourths of these were in the classes for single houses, and eighty-five designs were for single houses of the highest cost, \$4500. The leisure that has prevailed in the offices of the West was apparently reflected in the competition. Of the twenty-four awards given, twenty-two went to the East. The designs show an appreciation of the value of simplicity in houses of low cost. The architectural effects were sought mainly by good proportion, and the use of pilasters, panels and such simple means to which the material readily lends itself. The surface treatment, so important in building work of concrete, does not appear to have had full consideration. The Inland Architect, and other leading Eastern architectural journals, think that many of the designs show a lamentable lack of familiarity with the possibilities of concrete in this regard.

Those having occasion to buy lumber or products made from lumber are forcibly impressed with the rapid increase in the price of this material. It is well known that the supply of timber is decreasing but the rapidity of this decrease is rather startling. During the year ending June 30, 1906, the export value of wood and manufactures of wood from the United States was \$69,080,394 and for the eight months ending with February, 1907, \$51,622,435. The total annual output of forest products for foreign and home consumption is now estimated at \$1,075,000,000.

In a paper on the timber supply of the United States, R. F. Kellogg, government forest inspector, shows that we are consuming every year between three and four times more timber than is grown in the same time. In addition to this we are consuming the wood and timber which is nearest to the market, so that what is left is at points difficult to get at.

It is evident that the price of lumber must continue to increase unless some means can be found by which either the consumption of timber is reduced or its growth increased. This can be brought about only by increased acreage and by careful cutting of timber districts so as to save the young and growing trees. In Germany the remedy has been found in the organization of extensive forest reserves and the adoption of a settled policy of management which allows the cutting of only as much timber each year as will be replaced by the annual growth. This plan may be followed here. The growing use of concrete as a substitute for wood will also help to relieve the situation.

Architects Successful in Suit

Architects probably have more trouble in collecting payment for their service in cases of dismissal and substitution than in any others where they have occasion to seek relief in the courts, says the American Architect. When such, fortunately rare, cases do come before a court and are settled at all in the plaintiff's favor, it is most commonly on a quantum meruit basis. It is worth while, therefore, to note that, after three years' effort, a Pittsburgh jury, under Judge Fraser's instruction, has awarded in full to Messrs. Nirdlinger & Simpson the two and one-half per cent commission they claimed for work done by them in preparing to build a \$50,000 warehouse near Third avenue and Try street, Pittsburgh. The case is imperfectly reported, but it appears that the architects' work was approved and they were told to go ahead and get estimates; but, before they could do this, the client turned the job over to another architect, who actually erected the building and was duly paid for his work.

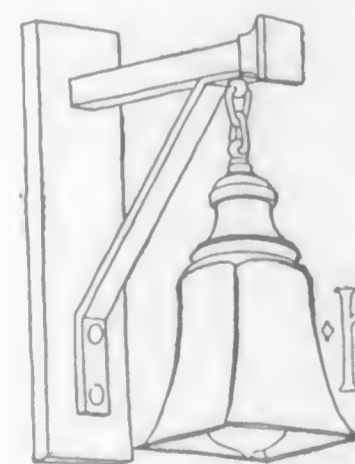
The Publisher's Corner

Modern Wood Finishing.

Architects, contractors and builders would do well to familiarize themselves with the results that are being produced in wood finishing by the use of Wheeler's Patent Wood Filler. A cabinet containing various samples of wood thus treated is on exhibition at the salesroom of Whittier, Coburn Co., 18 Sansome street, San Francisco, and anyone interested is cordially invited to call and inspect. The samples are really exquisite. The object of using a wood filler is to fill the pores or grain of the wood in such a way that there will be a perfectly smooth, lasting and transparent surface for the application of the varnish or finish. The filler not only answers all these requirements, but it develops the full life and beauty of the wood and brings out the figures with remarkable clearness.

Plenty of Work for the Smith-Rice Company.

The Smith-Rice Company has been awarded the contract for erecting the steel for the new Pioneer building on Fourth street, near Market, San Francisco. The Lindgren-Hicks Company are the general contractors. The Smith-Rice Company also have the steel erecting well in hand for the Wethered building on Second street, and the Mechanics' Bank building on Market street. The collapse of one of the floors in the last-named building recently was not due to any inferior workmanship on the part of the Smith-Rice Company. The fault lay in overloading the floor before the steel beams had been properly riveted. Fortunately no fatalities resulted and the damage was insignificant.



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Success of New Enterprise

The A. C. Rulofson sheet metal works have been awarded the contract for installing the Edwards' improved fire-proof metal windows and frames in the Alaska Commercial Company's building, being erected by the George A. Fuller Company at Sansome and California streets, San Francisco. The same company is also erecting the Atlas Investment Company's new hotel and they are using the same window.

Judging from the number of signs displayed on the new work all over the city, reading, "Sheet Metal Work and Metal Windows Being Installed by the A. C. Rulofson Sheet Metal Works," Mr. Rulofson is making a phenomenal success of his new enterprise. The successful manufacture of metal windows in San Francisco is keeping at home a great deal of capital that would otherwise be sent to Eastern cities, and it is to be hoped that the encouragement now being given to the above named concern will be continued.

All "Class A" buildings should be installed with the Edwards' Window, as it is a fire protection and it also reduces the insurance rate.

Busy Steel Erectors

Without doubt one of the busiest firms in San Francisco since the fire is the C. A. Blume Construction Company,

erectors of all classes of structural steel buildings. The company has offices in the Jefferson Square building at 925 Golden Gate avenue. Mr. Blume reports the following big contracts on hand: D. Hewes building, fifteen stories; Clunie building, Cunningham building, Washington street school, Oakland; Valencia street theater, Spreckels' building, Bush and Kearny streets; Regan building and the Prescott school, Oakland. The firm is now at work wrecking the Crellin and Brandenstein buildings. Contracts have been completed on the following jobs in addition to about thirty smaller jobs: Flannery building at Geary and Market streets, which was the first steel frame building erected after the fire; Hale building, Emma Spreckels' building, Call Annex, Orpheum theater, Princess theater, Alcazar theater, Lynch building, Sloss building, Apache building, Station "C" of the San Francisco Gas and Electric Company, and the Sterling building.

Woods & Huddart

This firm, located at No. 11 Front street, San Francisco, is well known as extensive handlers of iron and steel products. The firm's sign occupies a conspicuous place on several prominent buildings as having furnished the structural steel and steel bars for concrete reinforcement. For steel bars Woods

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& Huddart are selling agents for the Buffalo Steel Company of Tonawanda, New York, who make exclusively high carbon bars. These bars can be furnished in rounds, squares, twisted squares, flats, and also the latest type of bars which are being made by that company (the spiral bars), which are extensively used instead of twisted bars, as the spiral have no sharp corners.

Woods & Huddart are also representatives of several mills that produce medium steel bars, rounds, squares and twists, for concrete work. During the past year they have furnished bars required in the new building of the American Biscuit Company, located at Battery and Broadway streets, and which is the largest concrete building to be erected in San Francisco since the fire. The following buildings have been supplied with steel bars by this firm: McGregor, Boyd, McCone, Schiff, Drexler, Durbrow, Bernard, Younger, Haslett Warehouse, Elkan Gunst, M. A. Gunst, Sanford Sachs.

In addition to the foregoing list they have supplied portions of the bars on several other buildings, and also include in their list of customers: Lindgren-Hicks Company, James Stewart & Company, Ferrolite Company, American-Hawaiian Eng. Cons. Company, Kittle

Construction Company, Pacific Construction Company, John R. Sheehan & Company, Land-Wharton Company, Richards-Neustadt Construction Company, Keatinge-Bradford Company, Frank B. Gilbreth, Couchot & Thurston, Koenig & Pettigrew, Ralph Warner Hart, E. Remington, and the Henry Cowell Lime and Cement Company.

The great advantage that this firm has, is that they have been and are now in a position to make immediate shipment from the various mills, or prompt delivery from their stock in San Francisco.

On structural steel, Woods & Huddart are the agents for Levering & Garrigues Company of New York, and are in a position to furnish estimates on structural steel for buildings and bridges fabricated, for quick shipment.

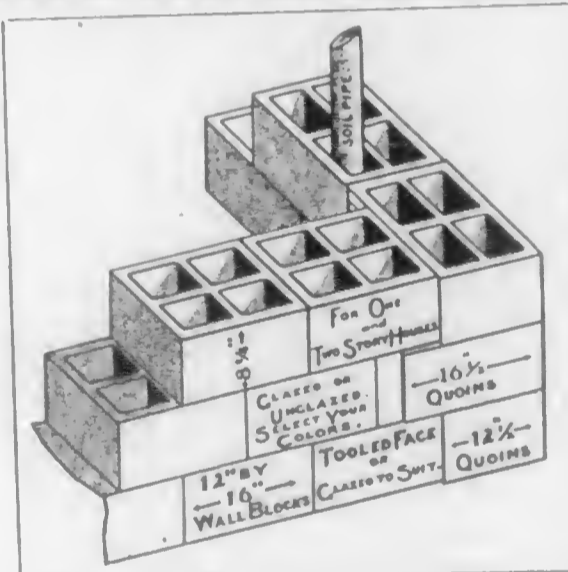
In New Quarters

The Delmar Smith Company, engineers and contractors, have moved to more pretentious and commodious quarters on the fourth floor of the Kohl building, San Francisco. This company was formerly located in the Stovel building on Market street. Delmar Smith is the head of the company which is prepared to figure on all kinds of construction work. Mr. Smith is a hustler.

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Hardwood Floors in Demand.

Percy and Herbert Meyer of the Hardwood Interior Company, with offices and show rooms at 873 O'Farrell street, San Francisco, have had their share of the new business since the fire, although just at present business is a little slack. This company, however, is feeling the depression no more than all the other material people and with the settlement of the labor troubles there will again be plenty of work for the firm. The Hardwood Interior Company furnished the inlaid and hardwood floors in the Fairmont Hotel and have just contracted to put down the hardwood floors in the First Baptist church of Oakland. The handsome residence of Mrs. Louis Sloss at San Rafael has hardwood floors which were laid by the Meyer brothers and the Williams & Berg tailor establishment in the new French Bank building on Sutter street has been made most attractive with handsome office fixtures and polished hardwood floor installed by the Hardwood Interior Company.

Growth of Empire Plaster Company

In spite of the fact that part of its plant was badly damaged by the high water last spring, necessitating the shutting down of the mill for a time, the Empire Plaster Company has managed to catch up with orders and by a display of exceptional enterprise on the part of Manager Curry, the old plant has been restored and added to so that at present more than eighty tons of hard wall plaster are being turned out daily. The mill is located at Empire while the depository is about five miles distant. The construction of a railroad between the two places has been under contemplation for some time and either a private line will be laid or a second mill, close to the depository, will be built and equipped at an outlay of about \$40,000. The company's water plant was permanently put out of service during the floods and since then the machinery

has been operated by electric power. Empire hard wall plaster is now so well known on the Pacific Coast that few architects ever specify anything else in the plaster line.

Collapse of a Brick Building

The Santa Fe roundhouse, a brick structure, one story in height, with twenty stalls for engines, collapsed at San Bernardino July 4th, burying ten locomotives beneath the debris. The cause is unknown, but a crack in one of the side walls had been noticed for some time. The collapse is believed to have been due to a general weakening of the sidewalls.

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Worswick Street Paving Company
The Worswick Street Paving Company of Fresno has lately taken several good size contracts for street paving. Under the personal supervision of Mr. Worswick, the company is finishing a nice paving job for the city of Hollister. Something over 165,000 square feet of asphaltum is being laid and when finished Hollister will have a main business thoroughfare second to none in the state. The company is making preparations to start work on a job in Modesto that call for nearly 300,000 feet of paving blocks. About ten streets are to be put in shape. The Worswick people are rapidly gaining a reputation throughout the Coast for doing first-class street paving and as a result they are receiving more contracts than competing companies.

Architects Should Specify This Tray
J. F. Reilly & Company, 23 and 25 Spencer place, San Francisco, manufacturers of the well-known star cement laundry tray, report a very good business since the fire. The company was one of the first to resume business, building a substantial plant on the site of the one burned. All trays turned out by this firm are sold under a written guarantee. They are manufactured from the most carefully selected ma-

terials, including the highest grade cement, and only experts are employed. The company is making a specialty of fish and butcher tanks and trays for apartment houses and flats. They are without doubt one of the most reliable concerns in this line of business in California.

Notice of Dissolution of Co-partnership
The co-partnership heretofore existing between Wm. Ham. Hall and L. J. Mensch, under the firm name of "The Concrete Company," is hereby dissolved by mutual consent, to take effect on the 30th day of July, 1907.
WM. HAM. HALL.
L. J. MENSCH.
San Francisco, Cal., July 23, 1907.

The Gladding, McBean Company has received the contract for furnishing all the terra cotta for the new ten-story Phelan building to be built at the corner of Market and O'Farrell streets, San Francisco. The building is to be of reinforced concrete and faced with terra cotta. William Curlett is the architect.

The Paraffine Paint Company has moved its general offices from Oakland, to which city it was driven by the fire, to the Merchants' Exchange building, where a handsome suite of rooms has been leased for a term of years.

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Work Done by Jno. Schulz

Few engineers in San Francisco have been in greater demand since the reconstruction of the burned city has been going on, than Jno. Schulz, whose office is in the Midway building. Mr. Schulz not only furnishes designs and estimates for steel frame and reinforced concrete buildings, but he takes personal supervision of structures for the architect and owner. Among the more important buildings for which Mr. Schulz designed the steel work are the Delger block, Class A and eight stories in height; the Young building, the Marion building at California and Drumm streets; the Idora Park skating rink; an eight-story building for the Holmes Investment Company and which will contain 1000 tons of steel; the Kirkoff building, a ten-story Class A structure at Sixth and Main streets, Los Angeles; the Eischmann

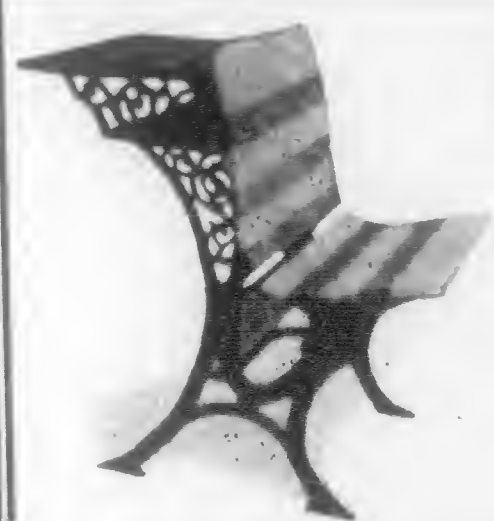
building at Seventh and Hill streets in the same city; the Roebing warehouse in San Francisco, and which will contain 1500 tons of steel; the Farmers and Merchants bank, Oakland; the Moore building at Pine and Battery streets, San Francisco, and the following reinforced concrete structures: Santa Ann building, Kearny and Powell streets, Alaska Commercial building at Sansome and California streets; a five-story structure at Sixth and Howard streets, the Scheidemann building at Stockton and Sutter streets, the Bishop warehouse in Los Angeles and a concrete residence in San Mateo. Most of the buildings above referred to were designed in the offices of the following architects: Meyers and Ward, Sutton and Weeks, Herman Barth, Meyer and O'Brien, Welch and Carey, and W. D. Shea of San Francisco, and Morgan and Walls of Los Angeles.

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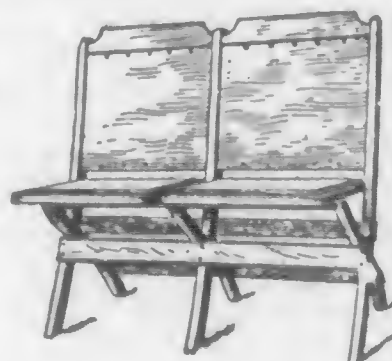
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¶ Sand-Lime Brick is fast being adopted by American Builders because of its various merits and advantages. ¶ The first successful System of Manufacture, Developed in Germany, and the Only One based on Perfect Scientific Principles is the *Schwarz System*. ¶ Western America offers Splendid Industrial Opportunities in the Establishment of Sand-Lime Brick Plants. ¶ The Patents for the *Schwarz Scientific System* west of the Mississippi are controlled by the

W. F. Barnes Commercial Company

223 Monadnock Bldg., San Francisco Phone Temporary 3097

Send for Full and Accurate Information about Sand-Lime Bricks and their making. Also estimates for Brick either Natural or Colored.

**STAR
Cement Laundry
Trays**

We sell our Trays under guarantee. They are made from the Highest Grade Materials and are Superior to any on the Market, both in Strength and Finish. ♣ ♣ ♣ ♣

Write for Price List

J. F. REILLY & CO.

23-25 Spencer Place
SAN FRANCISCO, CAL.

**THE HEWITT
MACHINERY COMPANY**

Agents for the well-known

**Thomas
Electric Hoist**

*Efficient—Clean
Economical—Noiseless*

37 SECOND STREET SAN FRANCISCO

When writing to Advertisers mention this Magazine.

A Steel Standard Opera Chair.

Attention is called to the new opera chair which is uniformly used throughout the Eastern States, and has found its way to the Pacific Coast, the Empire theater of San Jose having recently been fitted up with this form of furniture, through the California agents, the Spencer Desk Company of 507 Montgomery street, San Francisco. The remarkable part of the chair is the fact that it is the strongest and latest form of theater furniture made, and results in considerable economy to the user in the lack of breakage, entire absence of dust-catching parts, and the noiseless action of the hinges.

The opening of every performance at a theater is usually punctuated and sometimes entirely brought to a stop, as far as the hearers are concerned, by the constant slamming of seats being arranged for late arrivals. The friction hinge used on this chair makes this an absolutely noiseless action.

The structural portion of the seat made of wrought steel instead of the usual cast iron, renders it impossible to break the same. The simplicity and directness with which the parts are applied constitute a considerably cheaper equipment than an equivalent chair in any other form.

The manufacture is most interesting, and as stated by the makers, is as follows:

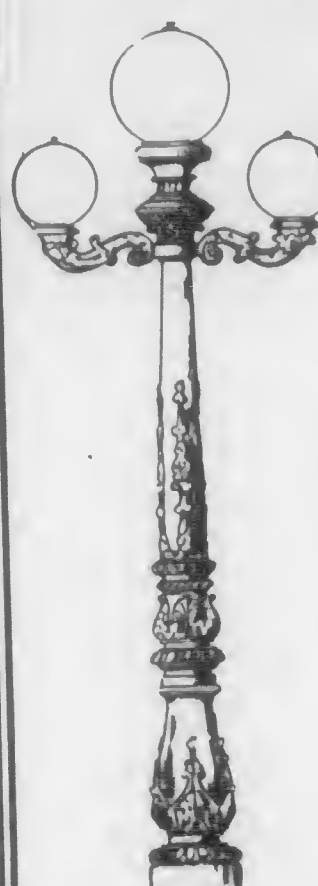
"The legs of the chair are made of what is known as Tee (T) steel one inch on a side. The pieces which support the back and the hinges are made of hoop steel pickled and limed. The tie pieces, etc., are made of bar steel No. 10 in several different widths. We do not use angle iron in this chair, but use the flat bar and form it on the press. There is not a piece of cast iron about the whole chair. All of the work is done by punch presses and it requires from 60 to 70 operations.

"The only heat applied is that used in case hardening that portion of the hinge upon which the wear comes, this being the little shoulder on the round flat piece which goes on the outside of the hinge; likewise in the back-support strength is acquired by putting in two ribs which tend to stiffen the back."

Prospective builders and architects who have seen the chair and noted its action and putting together, are enthusiastic about the same and feel that it will supplant the old-fashioned clumsy seat used in theaters, lecture halls, etc.

The new Victory theater, now under construction in San Francisco, will be supplied with the new chair, as will several other amusement houses on the Coast.

**ORNAMENTAL
Street
Lights**



Streets of Oakland,
San Francisco and
Berkeley are the best
evidence of the character
of my work.

Electroliers for Streets
and Buildings.
Estimates furnished.

H. A. SMITH
409-411 Fourth Street
Oakland, Cal.



Wears Longer
THAN ANY OTHER ROOFING
because it is composed of a practically
imperishable material.

Gives Better Service
THAN ANY OTHER ROOFING
because it possesses highest fire-resisting
properties and is wind, moisture
and weather-proof.

Costs Less
THAN ANY OTHER ROOFING
because it is the "cheapest per year
roofing" on the market; coating or
painting not being necessary to pre-
serve it.

Write for Samples and Catalog

H. W. JOHNS-MANVILLE CO.
180 Second Street, San Francisco

When writing to Advertisers mention this Magazine.

Oakland's Great Hotel

Bids are being taken for the construction of Oakland's new \$2,000,000 hotel at the office of the supervising architect, Walter J. Matthews. The plans are from the office of Architect H. J. Hardenbergh of New York. The building is to occupy the spacious site at Fourteenth and Harrison streets. The building will be of stone and brick and six stories in height.

The first floor provides for wide foyers and corridors, a splendid court in colonnades, a cafe, grand dining-room, ladies' grill, breakfast room, ballroom with movable stage, promenade lobby, reading and reception rooms, offices, etc.

The five upper floors of the building are to be divided into guests' rooms, the main feature of which is that they are to be all single rooms facing on the streets or courts, and will have bathrooms between the rooms and will be so arranged that the rooms can be used as suites or single. All the bathrooms will face on the streets or courts, and are known as outside bathrooms, giving them plenty of light and sun, air and ventilation. These bathrooms will be fitted up with all the latest plumbing fixtures, tiled floors and walls.

In the basement of the building will be billiard room, barber shops, children's dining-rooms, kitchens, machinery room, laundries, refrigerating rooms, baggage room and other necessities. There will be six high speed elevators for use of the guests, as well as elevators for the servants and the baggage.

The interior finish, decorations and the furnishings will be in harmony with the magnificence of the general architectural plan. The stockholders are Oakland bankers, businessmen and others, representing all classes. The directors of the company are W. W. Garthwaite, Edson F. Adams, W. G. Palmanteer, W. G. Henshaw, P. E. Bowles, Thomas Prather, D. Edward Collins, H. C. Capwell and J. C. McMullen.

"Perolin."

Announcement has just been made of recently completed arrangements by which the H. W. Johns-Manville Co., the well-known asbestos firm, with branches in all the leading cities, has acquired the exclusive sales agency for "Perolin" throughout the United States.

"Perolin" is a remarkable product that solves the important problem of preventing the dust and dirt nuisance in public buildings, stores, factories, schools and homes.

In the past various indifferent and unsatisfactory methods have been devised for this purpose. The most common

method is to use wet sawdust, or sawdust, sand or salt mixed with crude oil or kerosene. All of these are ineffective. Most of them are highly combustible, and instead of cleaning the floors, leave them in an unsatisfactory condition. Wet sawdust to a certain extent allays the dust, but it leaves the floor muddy. Oily compounds assist in laying dust but leave the floors, carpets and rugs soiled. Oiled floors are condemned by the Fire Insurance Underwriters' Association because of the added fire hazard.

"Perolin" is the ideal fireproof floor-cleaning compound. Instead of laying the dust, it absorbs it. It draws the dust from cracks and crevices in the floors and from carpets and rugs. It is a powerful disinfectant, destroying all disease germs that are common with dust, leaving the air pure and wholesome and the floor absolutely clean.

The Chronicle Building

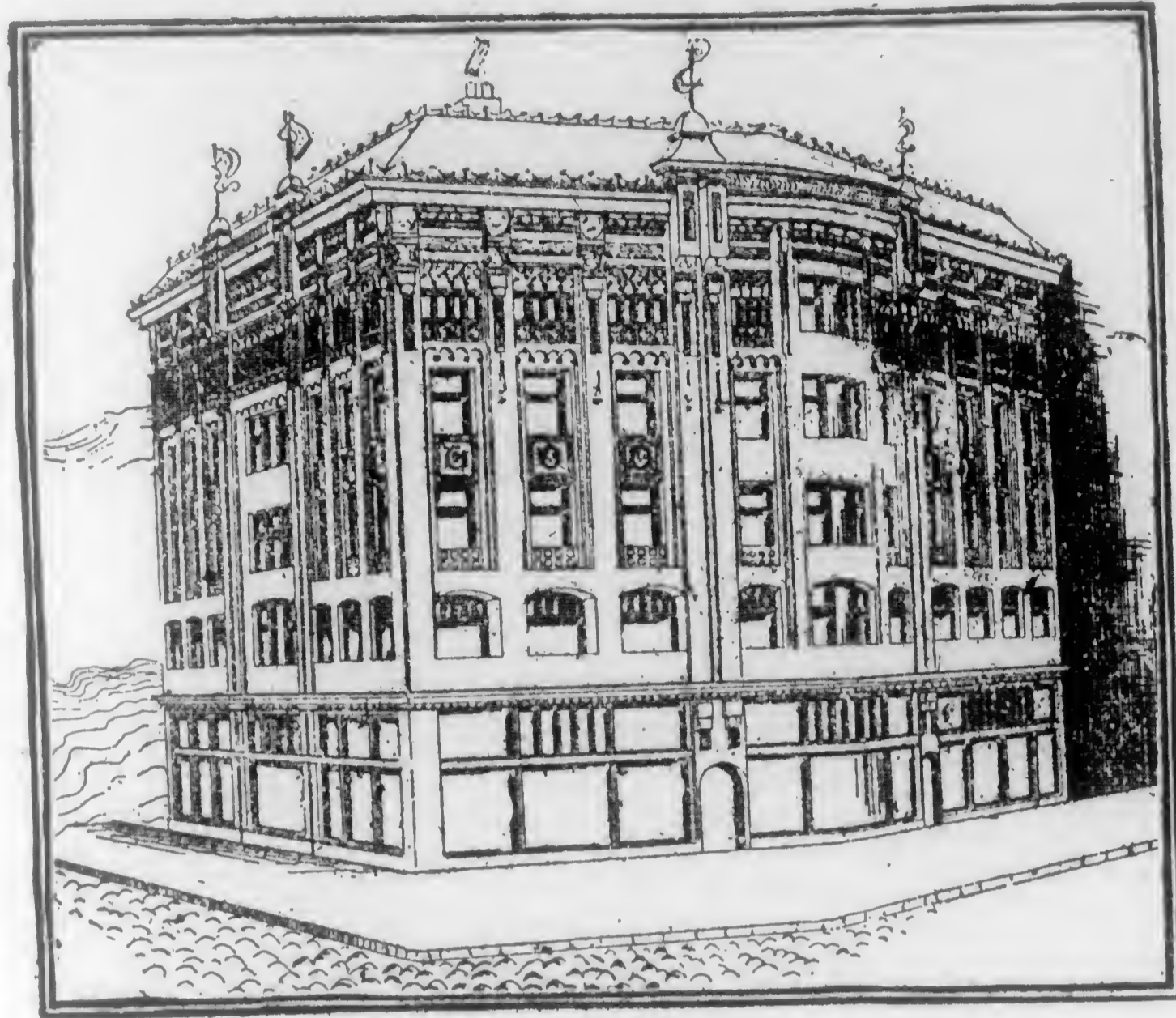
P. Noble is to furnish the steel for the Chronicle building. The work of demolishing the old structure is progressing rapidly under the excellent supervision of the American Construction Company. The job has been a most difficult one requiring not a little expert judgment to prevent accidents. The new building will be of the Class A type, with concrete floors and brick facing. L. B. Dutton is the architect.

Building Chinese Houses

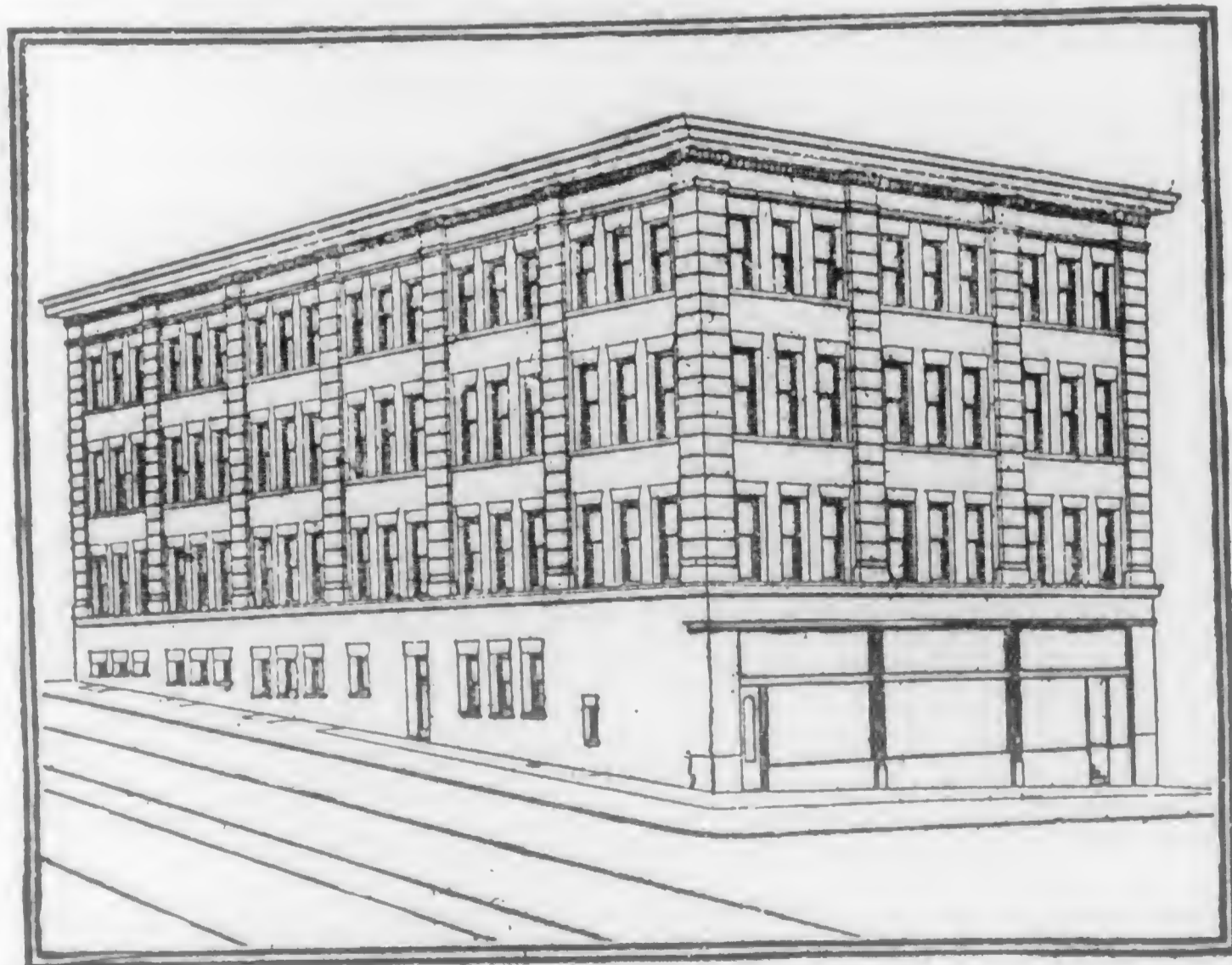
Architects Ross & Burgerin have plans for several picturesque Chinese buildings to be erected in San Francisco's new Chinatown. They will be two, three and four stories in height and will be typical in design of the native abodes of the Celestials. One of the buildings is already under construction.

Swimming Pools.

"Swimming Pools" is the name of a little book just issued from the press of Domestic Engineering, published in Chicago. The volume is unique in that it is the only work yet published which gives the details of the construction of swimming pools, directions for the selection of method of heating, size of heater necessary, etc. The book contains a number of diagrams and drawings illustrating various points brought out by the author. It is a handy volume for architects, engineers and plumbers to have on file in their offices.



Two Substantial Buildings now being Finished in the Wholesale District.
San Francisco



Big Reinforced Concrete Warehouse

SPOKANE, Wash.—A. M. Marshall, president of the Marshall-Wells Hardware Company of Duluth, Minn., has bought a site for \$110,000 on Main avenue near Market street, Spokane, where a six-story reinforced concrete structure, 300 by 142 feet, with a full basement, costing \$400,000, will be erected. Work on the structure is to begin next fall. The company is one of the largest hardware firms in the United States, having a capital of \$5,000,000 and a surplus of \$3,000,000.

Contract for Burrell Company

The Burrell Construction Company of Oakland has been given the contract for the construction of a post exchange and gymnasium building, and for the installation of the plumbing, heating and electric wiring of the same, to be erected at Fort Whipple, Prescott, Arizona.

Architect—Why was Michael Angelo a great swindler?

Contractor—Because he chiseled a woman out of a piece of marble, I presume.

Architects' Supplies
Picture Framing
Stationery

SMITH BROS.
462 Thirteenth Street
OAKLAND

W. T. VEITCH

R. M. VEITCH

W. T. VEITCH & BRO.
BUILDERS

OFFICE AND MILL:
1164-1166 WEBSTER STREET
NEAR FOURTEENTH STREET

OAKLAND, CAL.
TELEPHONE, MAIN 233

GOODYEAR'S PROTECTION FROM FIRE

FOR OFFICE BUILDINGS, FACTORIES AND RESIDENCES
RACKS -- RUBBER FIRE HOSE -- REELS

Cotton Rubber Lined Hose. Underwriters Unlined Linen Hose

METROPOLITAN FIRE EXTINGUISHER

Always Ready for Use

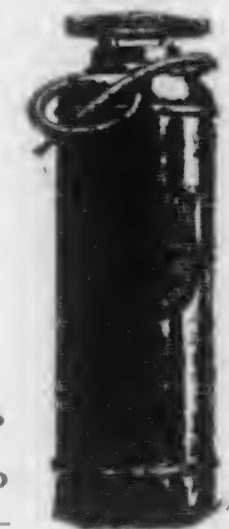
RUBBER MATTING
Stair Treads and Strips

RUBBER TILING
Send for Estimates

Goodyear Rubber Co.

573-579 Market St., San Francisco

— Same Location we had before the Fire —



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Pacific Surety Company of California

ORGANIZED 1885
Wallace Everson, Pres. John Bermingham, Vice-Pres. A. P. Redding, Sec.

Surety Bonds---Cash Assets \$430,000---Plate Glass Insurance
Home Office, San Francisco, California, U. S. A.

CASH CAPITAL, \$250,000.00

\$100,000.00 Deposited with the Insurance Department of the State of California,
for the Security of all Policy Holders. Telephone Temporary 1293

HOME OFFICE, 326 MONTGOMERY STREET, SAN FRANCISCO

HOLT & HABENICHT

(Successors to W. Holt)

Plate, Window, Prism

GLASS

269 Fell Street, San Francisco, Cal.

Telephone Special 479

READY MADE HOUSES

are like ready made clothes
Surprisingly Good Surprisingly Cheap

EASY TO GET

Buy one and be convinced

ANY SIZE ANY PLAN

Write to or Call on

THE HUBBARD COMPANY

1264 BROADWAY, Oakland, Cal.

Oakland Office in Sample Cottage.

Agents for NEVADA PORTABLE HOUSE CO.,
office and factory in Reno, Nev., care Borden
Shannon Const. Co. Box 479.



CORRESPONDENCE INVITED AND INQUIRIES SOLICITED



WE DIRECT the attention of ARCHITECTS

to our exceptional resources
for the complete interior dec-
oration of any style building.

Our complete and efficient decorative department; our extensive selections of decorative materials; and our close affiliation with American centers of interior decorative art, enable us to afford every possible advantage to architects for the effective expression of their ideas. Our work may be seen in finer residences of the Bay Cities, and several of the new hotels now building in San Francisco and Oakland are to be decorated by us. The leading architects our references.

L. TOZER & SON CO

WALL PAPERS, INTERIOR DECORATIONS
AND DRAPERIES

1527 Pine Street, San Francisco
187 Twelfth Street, Oakland

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— PATENT —
HYDRAULIC SEA-GOING SELF-PROPELLING DREDGE
DISCHARGING THROUGH 6000 FT. OF PIPE.



MAIN OFFICE:
San Francisco
BRANCH OFFICES:
New York,
Jacksonville, Fla.,
Los Angeles, Cal.,
Galveston,
Seattle,
Honolulu.

NORTH AMERICAN DREDGING CO.

GENERAL CONTRACTORS

— AND ENGINEERS —

HARBOR IMPROVEMENTS AND DREDGING MACHINES

OAKLAND, CALIFORNIA

BACON BUILDING, ROOMS 76-77-78 TEMPORARY OFFICES ADJ. OF U. S. FIRE

— Jobbers of —

Plumbing and Steam Supplies

Radiators, Boilers,
Storage Tanks

Wrought Iron Pipe, Malleable
and Cast Fittings, Brass and
Iron Valves

GEORGE H. TAY CO.

San Francisco, Office and Store 19th and Minnesota Sts.

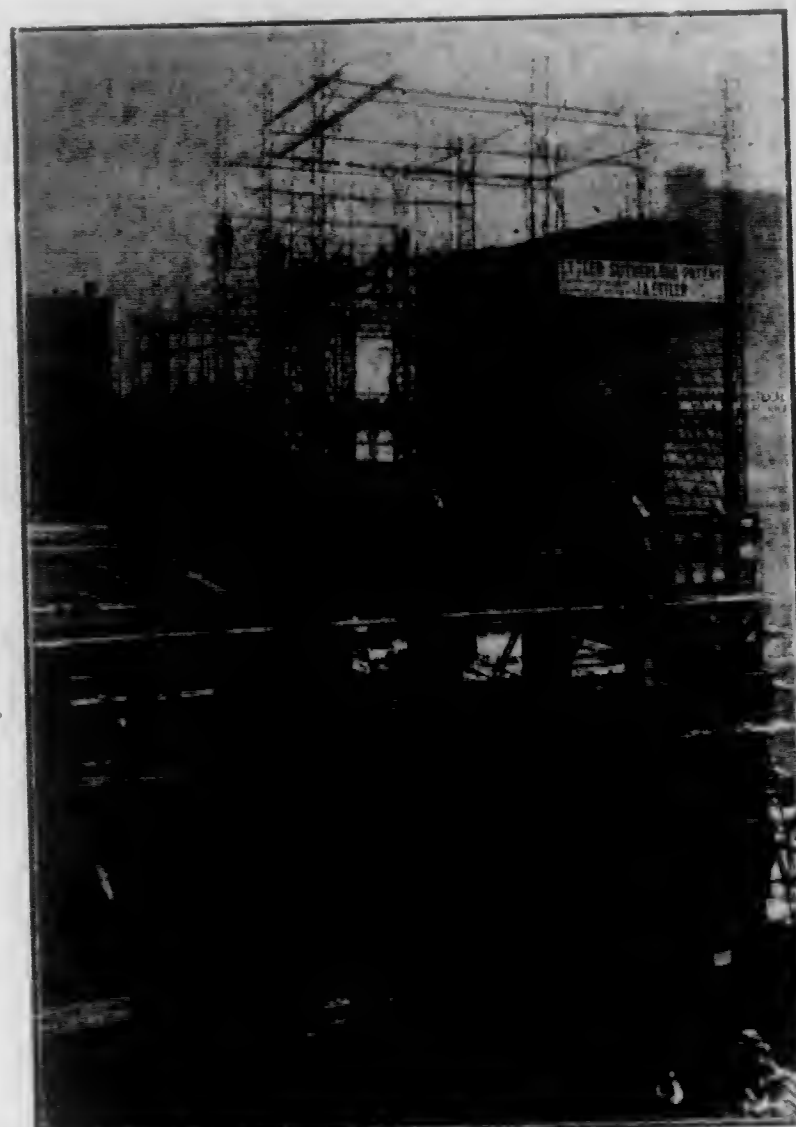
Warehouse 20th and Indiana Sts. Telephone Market 1710

When writing to Advertisers mention this Magazine.

Burnett Iron Works Busy

In spite of the depression in business in and around San Francisco, the Burnett Iron Works of Fresno has no cause to complain, for the company has had a busy year of it so far and the indications point to a continuation of good times. J. H. Burnett, president and manager, is an untiring worker and much of the success of the concern is due to his personal efforts.

The company is prepared to fill with promptness orders for iron or steel to be delivered in San Francisco or any point within a radius of 200 miles of Fresno. The steel frame for the new Elks' building in Santa Rosa was turned out at the Burnett foundry as was all the steel and iron for the new White House building in Santa Rosa, planned by Architects Stone and Smith of San Francisco. The Elks were so pleased with Mr. Burnett's way of doing business that they sent him a personal letter of appreciation. Other jobs recently taken or completed by the Burnett Company are a building in Bakersfield, an addition to the Fresno brewery, and a four-story building in San Francisco, Hoyt Bros., contractors.



Building for the Owl Drug Company, Mission Street near Second, San Francisco

Designed and Built by

J. A. ETTLER

According to the

Ettler-Sutherland Patent

A NEW SYSTEM OF REINFORCEMENT

OFFICE:

**302 ATLAS BUILDING
SAN FRANCISCO**

When writing to Advertisers mention this Magazine.

Back to California Street

The Western Building Material Company, which was located on California street before the fire, after which temporary quarters were taken at 340 Steuart street, San Francisco, is again back on California street in the Halsey building, No. 430, almost opposite the Merchants' Exchange building. The company has leased practically the entire second floor, which has been fitted up for the executive officers and their subordinates in a most attractive manner. The offices are light and airy and easily accessible.

Russell & Erwin Manufacturing Company
New Britain, Conn.



Wells-Fargo Building, Portland, Ore.

TRIMMED THROUGHOUT WITH
**RUSSWIN UNIT LOCKS AND
HARDWARE**

OFFICE AND SAMPLE ROOM:
**933-935 MONADNOCK BLDG.
San Francisco, Cal.**

Telephone,
Temporary 1370

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THERE IS ONE

and only one way to get best results from the use of

PRISM GLASS

and that way is to specify Luxfer Prisms to be installed by the

AMERICAN LUXFER PRISM CO.

INGERSON & GLASER CO.

MANUFACTURING AND SALES AGENTS

245 OAK STREET, San Francisco, Cal.

Empire Plaster Company

Manufacturers of Hard Wall Finishing and Dental Plaster

SPECIFICATIONS FOR EMPIRE HARD WALL PLASTER

Metal lath three-coat work:
 First or scratch coat—One part Empire hard wall plaster fibred, two parts sharp clean sand (fresh water sand preferable). Thoroughly mixed and applied within two hours after mixed.
 Second or browning coat—One part Empire hard wall plaster, two parts clean sharp sand floated up even with grounds.
 White or putty coat—One part Empire finishing plaster, three parts line putty gaged with hard wall plaster.
Sand finish—One part Empire hard wall plaster, two parts clean sharp sand.
Wood lath, two-coat work—One part Empire hard wall plaster fibred, two parts clean sharp sand (fresh-water sand preferable), mixed thoroughly and applied within two hours after mixing.
 White coat and sand finish same as for metal lath.
 Finishing coat should be applied within 48 hours after first coat is put on.

16th and Harrison Sts., San Francisco

Oakland Warehouse | ADAMS' WHARF | Phone Oakland 6821

THOUSANDS IN USE IN LOS ANGELES!
 ASK YOUR NEIGHBOR ABOUT THEM

IMPROVED CLIMAX SOLAR HEATER

ABSOLUTELY RELIABLE

WHY let the sunshine go to waste, and your money too, when at trifling expense you can put in your home an IMPROVED CLIMAX SOLAR HEATER that will furnish hot water from sunshine alone—winter and summer—for your bath, laundry, and all domestic purposes, without cost, damage or delay? It can be connected with the range, furnace or gas heater to insure hot water on rainy days, and when so connected saves the expense of a kitchen boiler. It insures a cool house during the hot season. Let us figure with you on your hot-water problem.

SOLAR HEATER COMPANY

342 New High St. - - - - - LOS ANGELES

When writing to Advertisers mention this Magazine.

You can save money

On every concrete structure—by using



Sullivan's All Steel Plank Holder

Sullivan's Plank Holder does away with nailing and makes the use of lumber again and again, possible. This device, which is patented, is easily and quickly applied and removed and saves its cost over and over.—Other contractors are saving money by its use. Are you? WRITE FOR BOOKLET
 J. H. SULLIVAN, 444 Norris Bldg., Grand Rapids, Mich.

Van Wagner Bros.

Plastering, Brick, Stone and Cement Work. Cement Contractors of New Casino and Bathing Pavilion, Santa Cruz.

Work Done in Any Section of California

Address:

Santa Cruz.

CEMENT

Guaranteed to Stand San Francisco Board of Public Works Specifications

Structural Steel Coke and Pig Iron

Girvin & Eyre

Merchants' Exchange Bldg.

SAN FRANCISCO

Cement Structural Steel Pig Iron Coke, Etc.

G. W. McNEAR

210 BATTERY STREET

San Francisco, Cal.

When writing to Advertisers mention this Magazine.

Gets Heating Contracts

The Machinery and Electrical Company of Los Angeles, and a regular advertiser of the Architect and Engineer, has been given the contract for heating and ventilating all five of the new school houses to be erected in San Jose. The contract for the High school is \$14,800 while the bids on the other four buildings average \$4,446 each.

New Artificial Building Stone

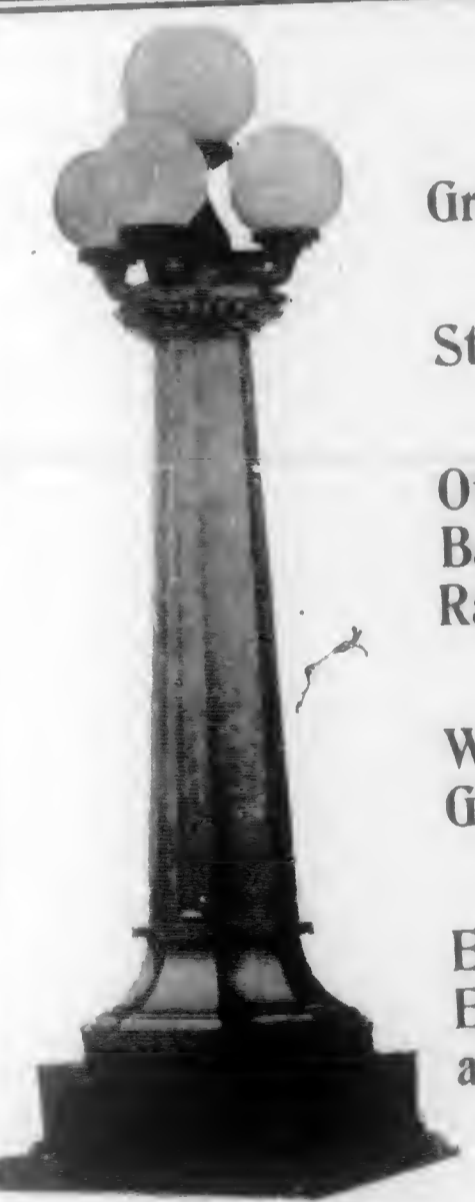
A new artificial building stone has been placed on the market and will have its first local application, with one exception, in the Fairmont hotel in San Francisco, in form of partition walls which are at once fireproof and soundproof.

It is a new invention brought from Australia, where it has been extensively employed by Mr. Frank Hudson. A company has been formed to exploit the new

material and it has already received wide recognition.

Technically it is described as an artificial building block to be used as a substitute for reinforced concrete in the construction of building walls; the object being the production of a block which will interlock with adjacent vertically disposed blocks and be held to adjacent side blocks by a bond joint, the block being strengthened by tie rods extended horizontally or longitudinally through bores formed in the block. In addition to the rods the blocks are further secured by tongue and groove formations and by corresponding borings locked with cement. Certain other blind openings form vacuums which render the stones fireproof and sound proof.

Mr. Hudson is now engaged in manufacturing the stone at the Fairmont Hotel, and he will be pleased to explain its merits to architects and owners.



Grille Work
Stair Work
Office and Bank Railings
Wire Guards
Elevator Enclosures and Cars

Electrolier, Fresno City Hall
MADE BY
White Ornamental Iron Company
Office and Works, Foot of Fifth Ave., Oakland
Telephone Merritt 57
San Francisco Sales Office, 499 Monadnock Bldg.
Telephone Temporary 2997



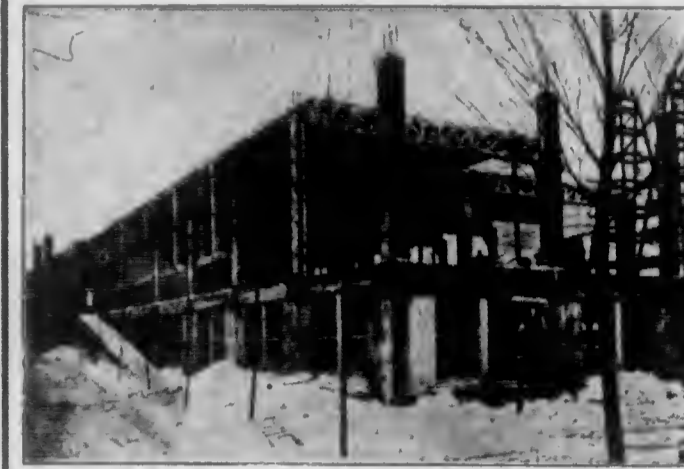
THE ENOS COMPANY
Of New York

Makers of LIGHTING FIXTURES

SPECIAL DESIGNS Gough and Pine Streets
AND ESTIMATES SAN FRANCISCO

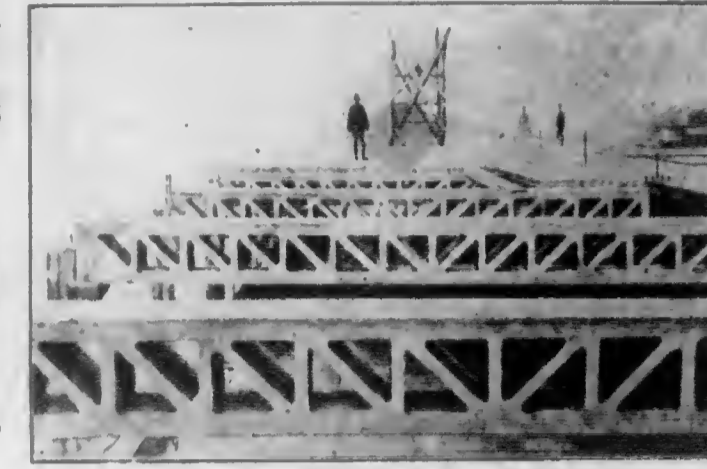
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"TINY"-VISINTINI SYSTEM of Reinforced Concrete



Exterior of Building

FACTORY BUILDING FOR TEXTILE MACHINE WORKS Reading, Pa.



Showing "Tiny" floor beams 40,000 sq. ft.

CONCRETE & STEEL ENGINEERING CO.

CONSULTING ENGINEERS

410 Kearny Street

San Francisco, Cal.

Owners of Visintini, Franke, Eggert and other Patents.

Specialties { Buildings, Foundations, Factories, Bridges, Power Plants, Sewerage, Sewerage Disposal, Purification.

The "TINY"-VISINTINI SYSTEM of Reinforced Concrete is the best, most economical, strongest and most efficient Reinforced Concrete System in the world.

The System saves 25% in Concrete, 10% in Steel, 75% in Form and Carpenter Work.

It can be applied in every form of building, as well in light as in heavy construction. For instance, as for 500 lb. live loads and again for spans from 10 to 120 feet. We have more than 75 Concessionaries in all parts of the world, among these, Representatives in New York, Chicago, Philadelphia, Los Angeles, San Francisco, Berlin, Munich, Vienna, Paris, St. Petersburg, Zurich, Cairo, etc.

Testing of Bridge Girders

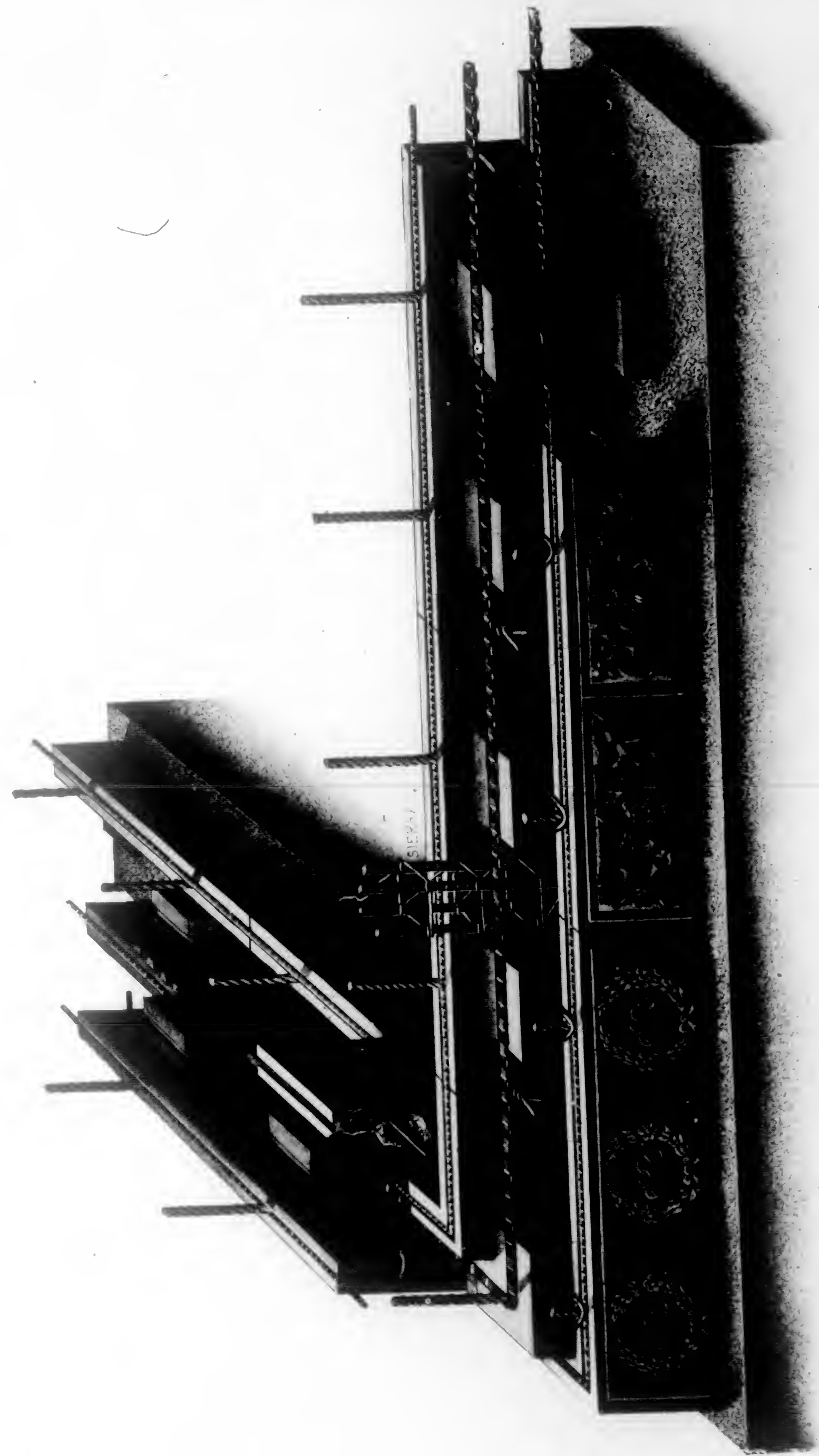


WANTED Contractors TO TAKE LICENSES IN ALL CITIES AND TOWNS IN NORTH & CENTRAL AMERICA. MOST FAVORABLE CONDITIONS

Bridge in Berzdorf, I. S.



When writing to Advertisers mention this Magazine.



This Perspective View Illustrates the Interlocking Stone Company's Patented System of Reinforced Interlocking Concrete Construction and Shows the Breaking of Joints, Horizontally and Vertically. (See Opposite Page for Details.)

ANNUAL MEETING OF INTER-LOCKING STONE COMPANY.

Price of Stock Advanced.—Bright Outlook for a Prosperous Year.

The Interlocking Stone Company, Inc., held its first annual meeting in Oakland Saturday, June 22, practically every shareholder being represented, either in person or by proxy. Those present were enthusiastic and a most successful year was predicted by the officers and managers. So great has been the demand for stock that it was decided to advance the price to five dollars, which price will shortly be increased again to \$10. Those who desire to purchase stock should communicate with the officers of the company without delay.

The secretary read his report as secretary and treasurer, showing the flourishing condition of the financial affairs of the company.

Manager Peterson reported upon the possibilities of the Interlocking Stone Company, its plant, machinery, and products. He said the composition of the stones made under the Peterson system, is the best as a building material to be found anywhere, in strength, flexibility, durability, etc., and he was positive that no improvements could be made upon the system of manufacturing stones. He reported that the company's mixing machine is "par excellence", with no competitors, in fact it is the only mixer that will give a thorough, uniform mix and give five distinct movements. The block machine and molds, when completed, would, he declared, astound the mechanical world, for their rapidity and perfection. The report was listened to very attentively and highly appreciated and gave the stockholders a firmer belief in the success of this enterprise.

The meeting was addressed by President Niggle, Vice-President Schiller, Manager Peterson, Director Wallace and Stockholders H. Andon, H. W. Bowman, M. G. Scribner, J. A. Reeder and the secretary, and from the remarks made, the stockholders could very plainly understand, that the speakers felt they had faith and great hope in the success of the company in the near future, and that nothing like it was on the market at the present time as an industrial investment.

A vote of thanks was extended to Mr. J. G. Niggle, the retiring president, for his energy and efficiency in performing his duties as president of the company.

The following directors were elected for the ensuing term: G. A. Peterson, F. V. Schiller, D. O. Wallace, M. G. Scribner and A. Weimann. The newly elected directors met and elected the following

officers for the ensuing term: G. A. Peterson, president, D. O. Wallace, vice-president, F. V. Schiller, manager and A. Weimann, secretary and treasurer.

The Keying or Interlocking of Building Stones.

(See illustration on opposite page.)

Numerous methods have been devised to impart to walls of buildings, etc., strength and the property of "hanging together," but nothing heretofore tried equals our simple, yet great, invention, of keying or interlocking each stone or block of a wall with its neighbors, so that when the wall is completed, it is practically all one stone.

It should be clearly understood that this interlocking is not only horizontally and vertically, but transversely built through the thickness of the walls. Add to this the steel reinforcement as used by the Interlocking Company and it will be found that a building so constructed is strong and safe in every part.

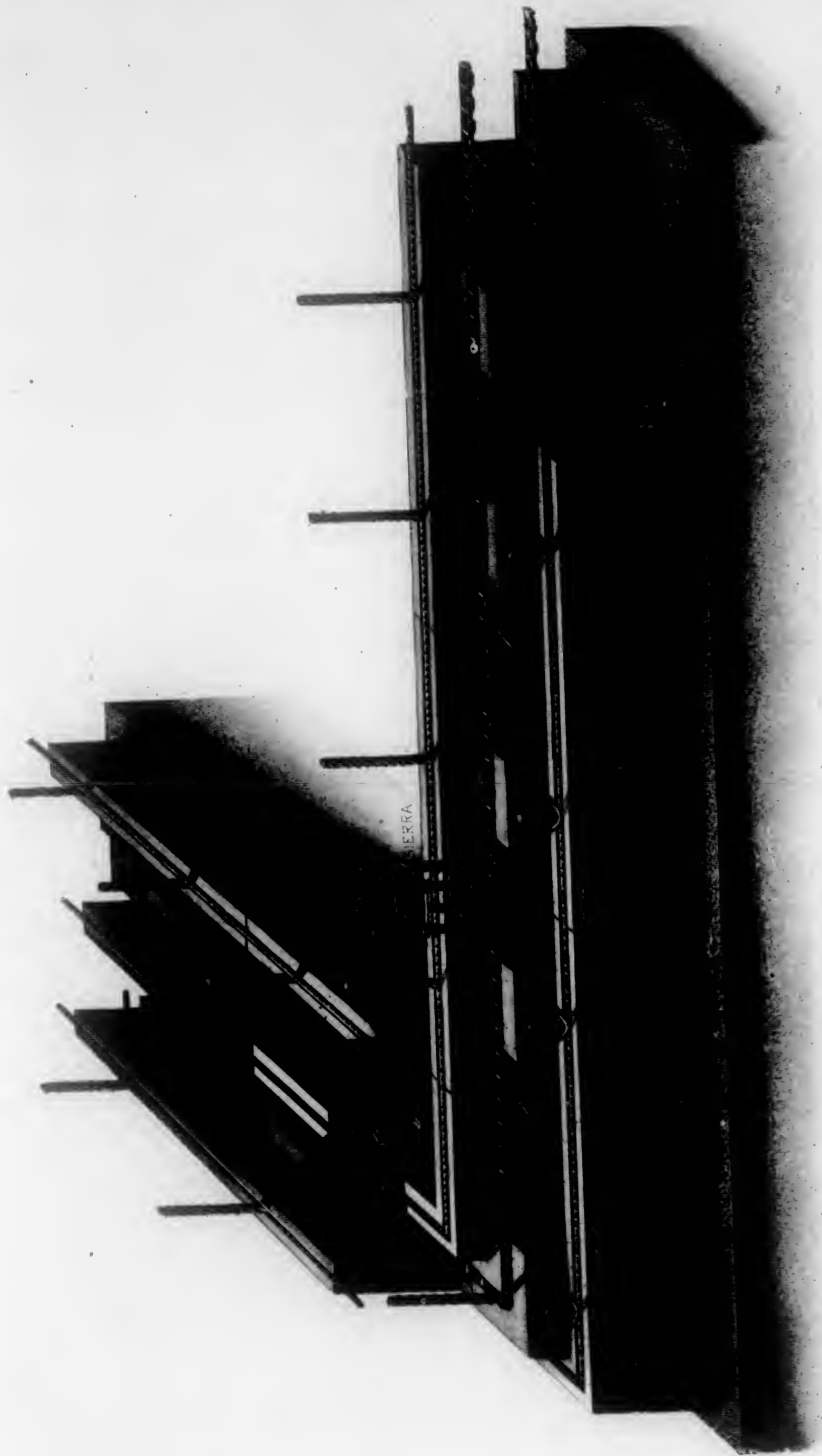
The stones can be made long before using and are consequently perfectly hard. Every stone is under derrick size, so that two men can handle the largest stone when placed in position, cemented and reinforced. We know then that this part of the wall is safe, and as the work progresses, we know that every part of it is strong and safe, and finally when the building is completed we know that it has been built in a safe and substantial manner throughout.

The falling of a building in process of erection—with Interlocking—Cement Stones, simple or reinforced, is an utter impossibility, and herein we stand ahead of all and every other method of building in stone, brick, concrete or wood.

A SOUND INVESTMENT BUY SHARES IN THE INTER- LOCKING STONE COMPANY

July 1 shares were advanced from \$3.00 to \$5.00. In a few weeks they will be
RAISED TO \$10.00
Investigate and be convinced.
Nothing better on the market today.

INTERLOCKING STONE COMPANY
563 Ninth Street - OAKLAND



This Perspective View Illustrates the Interlocking Stone Company's Patented System of Reinforced Interlocking Concrete Construction and Shows the Breaking of Joints, Horizontally and Vertically. (See Opposite Page for Details.)

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The meeting was addressed by President Niggle, Vice-President Schiller, Manager Peterson, Director Wallace and Stockholders H. Andon, H. W. Bowman, M. G. Scribner, J. A. Reeder and the secretary, and from the remarks made, the stockholders could very plainly understand, that the speakers felt they had faith and great hope in the success of the company in the near future, and that nothing like it was on the market at the present time as an industrial investment.

A vote of thanks was extended to Mr. J. G. Niggle, the retiring president, for his energy and efficiency in performing his duties as president of the company.

The following directors were elected for the ensuing term: G. A. Peterson, F. V. Schiller, D. O. Wallace, M. G. Scribner and A. Weimann. The newly elected directors met and elected the following

officers for the ensuing term: G. A. Peterson, president, D. O. Wallace, vice-president, F. V. Schiller, manager and A. Weimann, secretary and treasurer.

The Keying or Interlocking of Building Stones.

(See illustration on opposite page.)

Numerous methods have been devised to impart to walls of buildings, etc., strength and the property of "hanging together," but nothing heretofore tried equals our simple, yet great, invention, of keying or interlocking each stone or block of a wall with its neighbors, so that when the wall is completed, it is practically all one stone.

It should be clearly understood that this interlocking is not only horizontally and vertically, but transversely built through the thickness of the walls. Add to this the steel reinforcement as used by the Interlocking Company and it will be found that a building so constructed is strong and safe in every part.

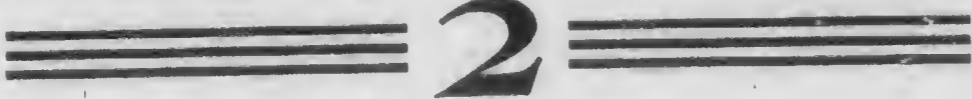
The stones can be made long before using and are consequently perfectly hard. Every stone is under derrick size, so that two men can handle the largest stone when placed in position, cemented and reinforced. We know then that this part of the wall is safe, and as the work progresses, we know that every part of it is strong and safe, and finally when the building is completed we know that it has been built in a safe and substantial manner throughout.

The falling of a building in process of erection with Interlocking Cement Stones, simple or reinforced, is an utter impossibility, and herein we stand ahead of all and every other method of building in stone, brick, concrete or wood.

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BUY SHARES IN THE INTER-LOCKING STONE COMPANY**

July 1 shares were advanced from \$3.00 to \$5.00. In a few weeks they will be **RAISED TO \$10.00**. Investigate and be convinced. Nothing better on the market today.

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