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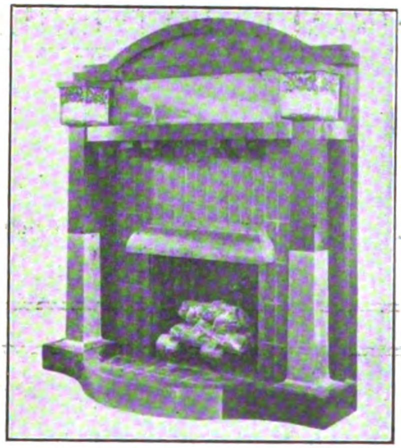

The Architect and Engineer
Of California

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THE

Architect and Engineer

Of California

VOL. VI. AUGUST, 1906. No. 1.

A Fire-Proof Theatre for the New San Francisco

By CHARLES F. ARCHER, C. E.

DESIGNING a theatre building for the new and greater San Francisco, under and in accordance with the new building ordinance is a task requiring infinite attention to detail.

The demands of the man behind the scenes, of the fire marshal, of the building inspectors, and of the theatre-going public, must be satisfied and must be made to harmonize with those of the man in the box office. The accompanying illustrations show an attempt to solve this problem.

This building is being erected for Messrs. Belasco and Mayer, the former proprietors of the Alcazar and Central Theatres, of San Francisco, and owners of the Belasco Theatre, of Los Angeles. It has been designed and is being built by Archer & Corwin, architectural engineers.

The building is situated on the southwest corner of Sutter and Steiner streets, 96 feet 3 inches on Sutter street and 137 feet 6 inches on Steiner street. The building covers the entire lot with the exception of an eight-foot passage along the west lot line from the proscenium wall to Sutter street. The main front of the building is on Sutter street and is designed after the old Spanish. The main entrance to the theatre is through a lobby leading from the center of the Sutter street front, on one side of which is located the box office and manager's private office.

There will be a confectionery store on the corner and a cafe on the west end of the front.

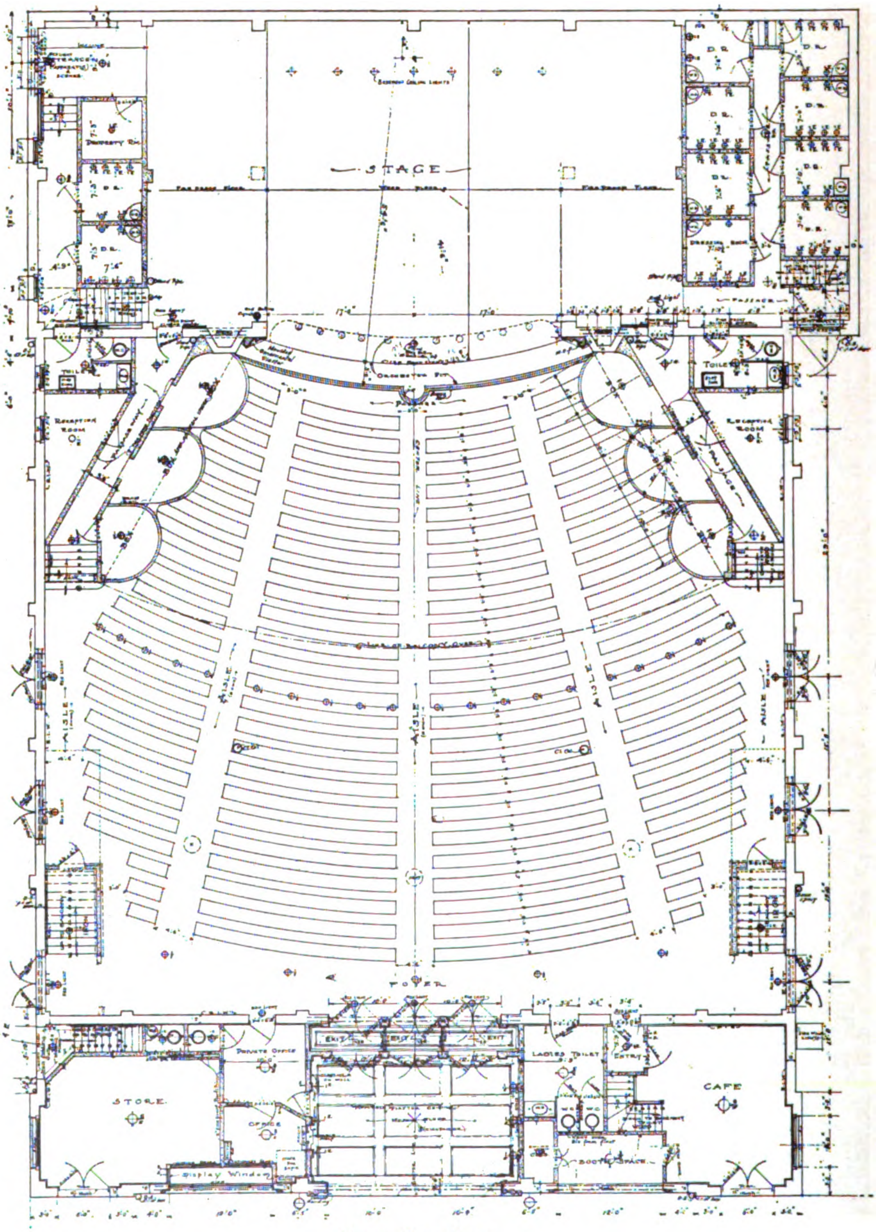
Between the lobby and cafe, with an entrance leading from the auditorium, there will be a ladies' parlor, which it is intended to furnish with every convenience for the comfort of ladies and children.

The second floor over the lobby and stores contains seven offices having an entrance from Steiner street and having no connection whatsoever with the theatre.

The main auditorium is seventy-seven feet long and eighty-eight feet wide, and contains one balcony and twelve boxes. The seating capacity is 1474. The balcony is supported on two columns so located that there is a clear view of the stage from every seat in the house. The sight line from the balcony allows the footlights to be seen from the rear row of seats.

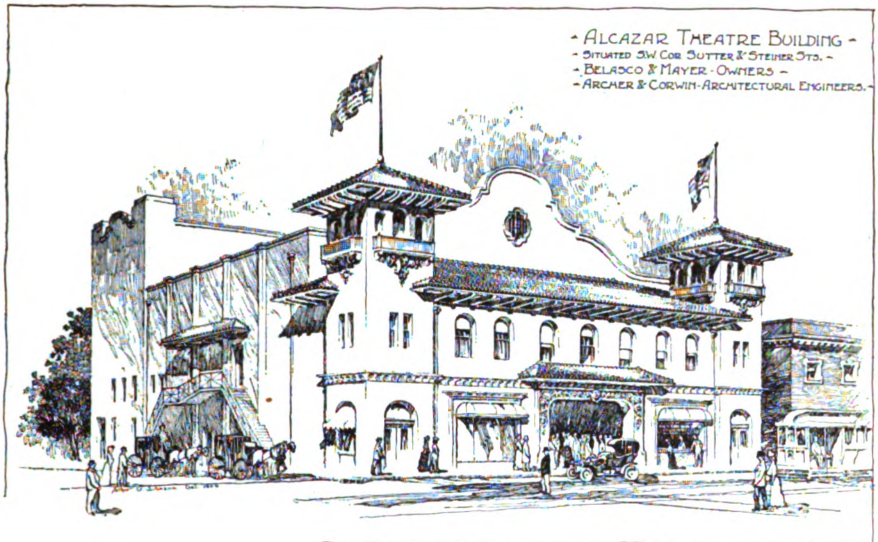
The box fronts leave the proscenium wall at an angle of sixty degrees, which will allow persons seated in the boxes a very full view of the stage.

The floor of the auditorium slopes toward the stage about one foot in every twelve feet. The orchestra pit is sufficient to accommodate the



GROUND-FLOOR-PLAN-
SCALE 1/8"-1'0"

Ground Floor Plan of Alcazar Theatre, San Francisco
Chas. F. Archer and Harley G. Corwin, Engineers



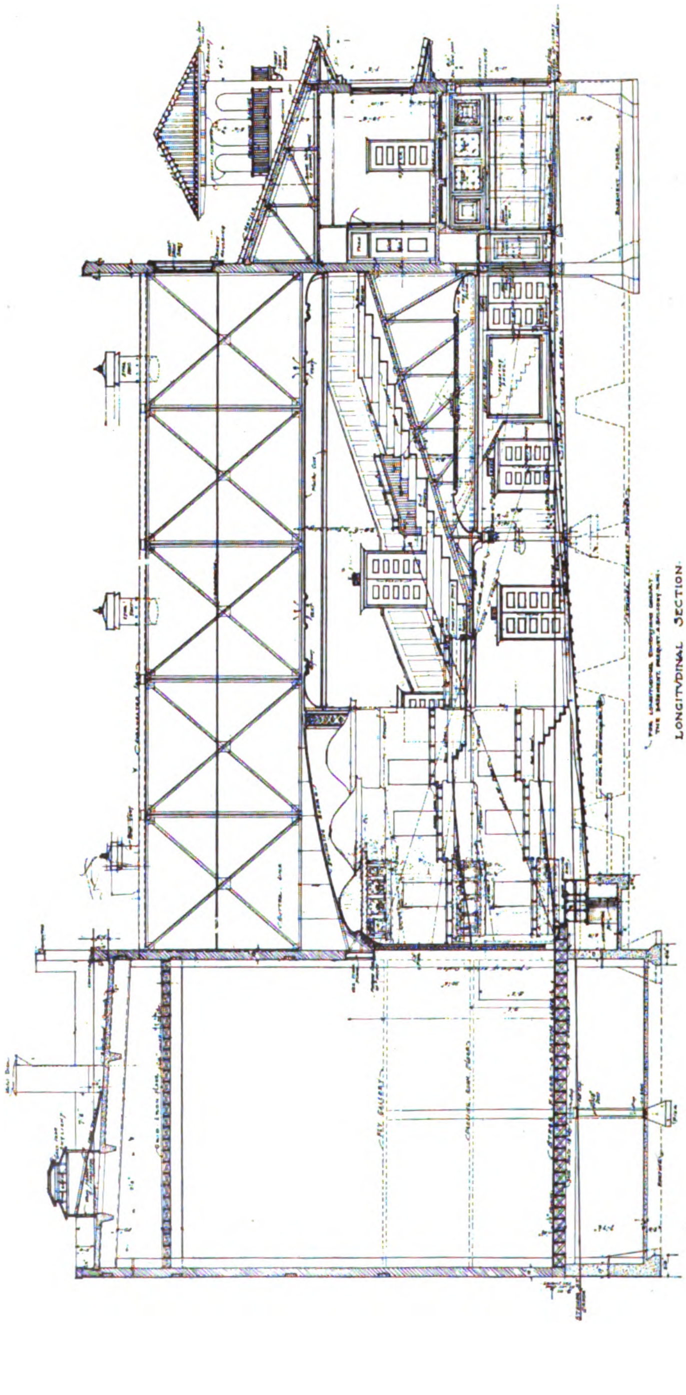
largest orchestra required for opera productions, and as will be seen upon examining the longitudinal section herewith given, is located partly under the stage, the leader occupying a semi-circular niche projecting into the center aisle. The pit is six feet deep and only the leader will be seen by the audience. The back wall of the pit will be of hard wood, forming a sounding board. This feature is an innovation in San Francisco but has been used successfully elsewhere.

The ornamentation of the auditorium is to be stucco and in design contains a suggestion of the Moorish, as the name "Alcazar" implies. Most of the ornamentation is applied to the boxes and proscenium arch, plain wall surfaces, appropriately colored, being considered more effective than masses of applied ornament and being much less expensive. There is to be a paneled wainscoting six feet high throughout the auditorium.

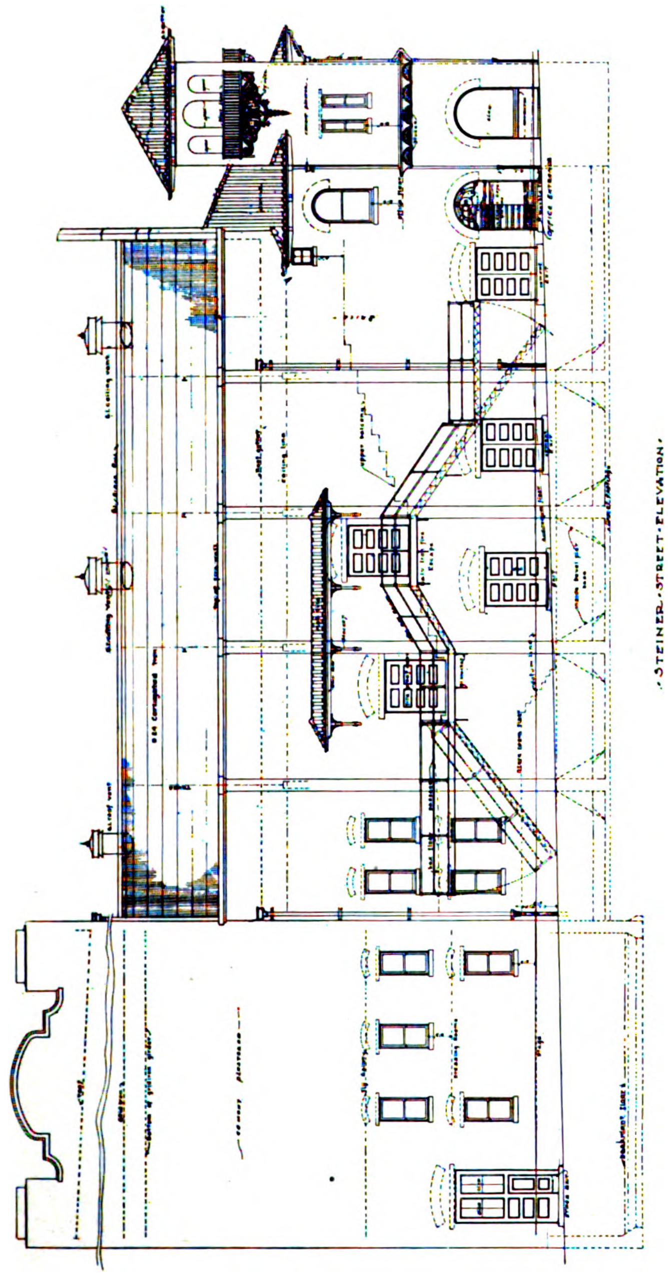
The stage floor is of fire-proof construction excepting a space the width of the proscenium opening from the footlights to the rear wall, which will be of wood. This is the only floor in the building that is non-fire-proof, and is permitted under the building ordinance to be so. The floor is to be almost entirely made up of trap doors. The stage is ninety-four feet long and thirty-five feet deep. There are two stories of dressing rooms at each end. The fly galleries, forming the ceiling for the upper story of dressing rooms, are connected by a paint bridge located five feet from the rear wall. Twenty-five feet above the fly galleries there is a metal gridiron, on which are located the blocks for raising and lowering the various curtains, flies and other paraphernalia used on the stage.

The stage roof is of reinforced concrete on steel beams and covered with asphaltum and is ventilated by two thirty-six-inch galvanized iron ventilators ten feet high and with counter-balanced flat tops to ventilate stage, also two skylights, so arranged that they will slide clear of their curbs upon releasing their fastening, which may be done from the stage floor.

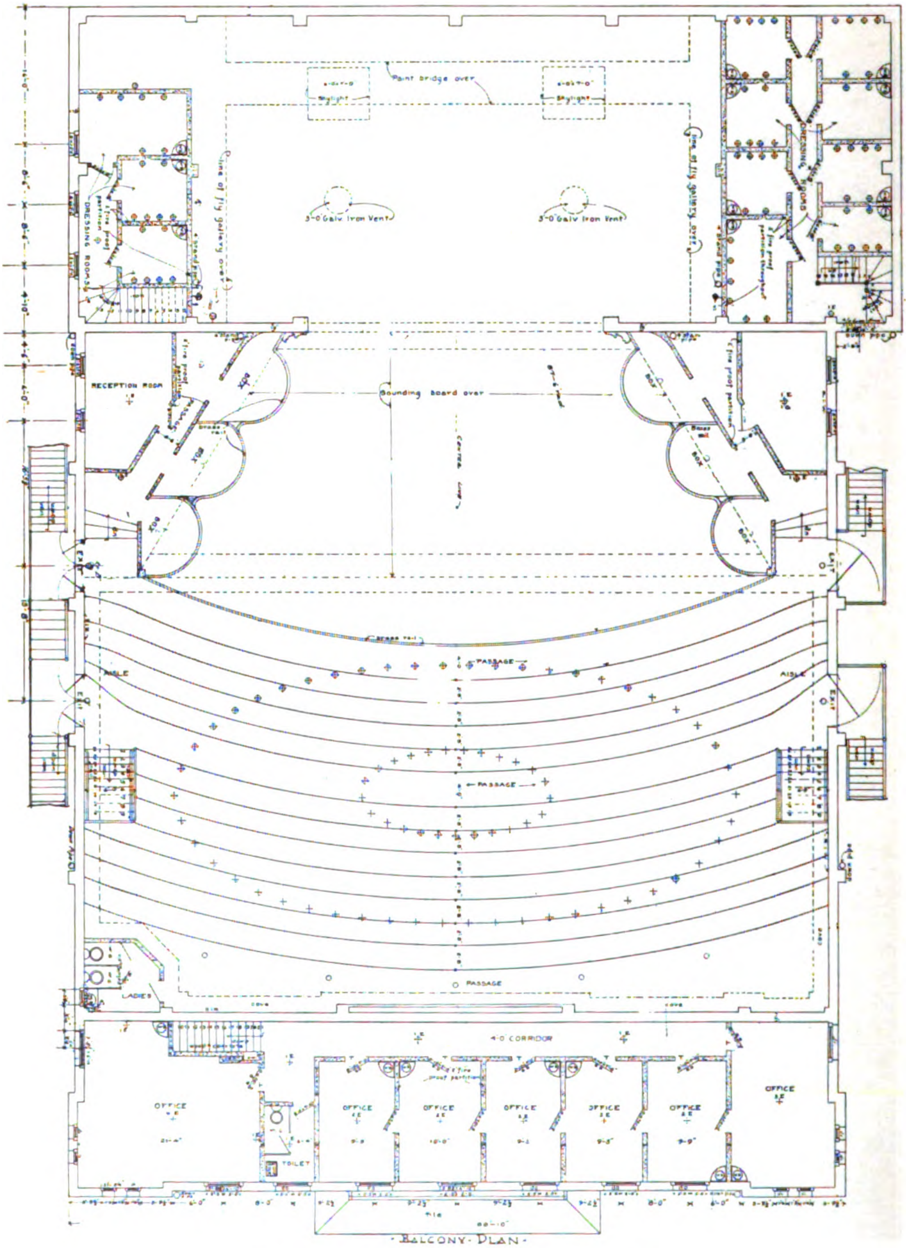
In construction an attempt has been made to follow the letter and spirit of the law and in a number of instances the law has been bettered. There are ten six-foot exits from the sides of the auditorium and the main entrance has twenty-two feet of clear opening. All stairs throughout the building are of iron. The walls are of brick supported upon a rigid steel



Longitudinal Section Alcazar Theatre, San Francisco
Chas. F. Archer and Harley G. Corwin, Engineers



Steiner Street Elevation Alcazar Theatre, San Francisco
Chas. F. Archer and Harley G. Corwin, Engineers



Balcony Plan for Alcazar Theatre, San Francisco
Charles F. Archer and Harley G. Corwin, Engineers

frame and will be plastered with cement plaster outside and plastered upon a damp-proof coating inside.

The roof over the front portion is of reinforced concrete covered with tile, while the roof of the auditorium is of corrugated galvanized iron, supported upon steel purlins carried by four trusses eighty-eight feet in span. The ceiling of the auditorium is plastered on metal lath and in order to deaden the sound of rain falling upon the roof, a false ceiling of plaster on metal lath has been designed to go midway between the roof and main ceiling.

In designing the structural work for this building the architects were bothered to no little extent by some of the provisions of the new building ordinances, notable among which is the provision that the metal of columns shall be at least eight inches from the outside of party line or court walls, while permitting four inches for front walls. To the writer this seems absurd, for the same section permits the metal of girders or wall beams to be two inches from the same lines, and in order that one may use thirteen-inch curtain walls it is necessary to place eccentric loads upon columns. The provision requiring an eight-foot passageway on each side of a theatre of this capacity and at the same time permitting obstructions at the end of the passage amounting to three feet, does not seem, to say the least, consistent.

* * *

Make Fireproofing Materials Bear Building Stress

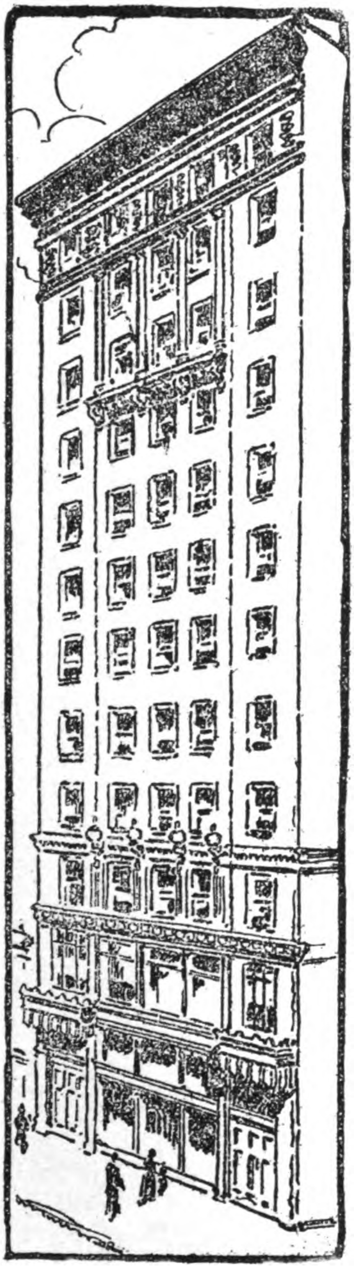
THE utilization of fireproof brick, terra cotta blocks and tile until recently in building has been confined almost exclusively for the protection of steel frames, partitions and ceilings. Modern building engineers are now making use of fireproof brick and tile not only for the protection given the steel structure, but are using them entirely for the construction of domes, stairways and arched ceilings and their function has been extended to the bearing of the stress of heavy loads. In a number of the lately designed buildings the main walls are built in the usual way of steel columns and girders to carry the load, protected on all sides by terra cotta semiporous and porous blocks, but the dome on the top floor of each structure is made with fireproof tiles. A double line of steel columns divide the domes in two sections, and from the top of these an arched ceiling effect is made of tiles. The span between the columns is sometimes upward of fifty feet, but so perfect is the arch made that the compression is uniformly distributed, and no part of the load is in danger of falling. The tiles used for this domic ceiling are 6 by 15 inches in size, and they are laid on edge so that the flat surface is exposed. The first few courses above the supporting steel pillars are made of fireproof brick, and then the tiles spring from this masonry work and gradually curve inward to the skylight of the dome. The tiles are laid in cement mortar.

Such a domic ceiling gives the maximum of lighting space at a minimum of weight and cost. The fire protection is considered by architects and engineers unusually safe. In the event of a fire the glass skylight could be broken through, but no other damage would result. The upper loft is completely incased in terra cotta tile burnt in the making to a temperature approaching 2500 degrees. There is no metal framework supporting the dome, and as a result no temperature below 2500 degrees could affect the stability of the arched ceiling.

Bank of San Jose of Reinforced Concrete
Henry A. Schulze, Architect

The New Building Law of San Francisco

*By W. J. CUTHBERTSON, Architect



Rough Sketch of New Magee Building
Bliss & Faville. Architects

GENERAL affairs having now returned somewhat into their normal channels and the days of temporary structures supposed to be relegated to the past, a few words regarding the new building law may not be amiss.

In considering it here, it is not the aim to criticize its minor points, but to consider broadly its provisions from an after-the-earthquake standpoint.

And before we enter into the subject let us state that from a commonplace standpoint the production does credit to its framers; especially considering the time allowed, the many conflicting interests to be placated and the general unsettled state of affairs.

It is a disappointment, however, to anyone who expected a document worthy of the occasion, and who naturally supposed that an event such as we have lately experienced—an event the like of which in the amount of destruction of wealth by natural means has never before been experienced in the world's history—would call forth more than a commonplace document, and one in keeping with our responsibilities under such circumstances.

This being not so, it becomes necessary to point out wherein it fails to fill the bill, and how it may be amended to satisfy, to some extent, the conditions under which we are now.

We shall take it as an axiom that a municipal building law is a law whose sole aim is to protect life and limb by calling for such an arrangement and construction of buildings that will be safe under all conditions so far experienced by man. What else can be its reason of being? This axiom being granted, any other aim cannot be entertained, nor must any of its provisions be for any other purpose.

In looking through the new building law it is evident it does not rise to the occasion. One fails to find in it any evidence of appreciation of the change wrought by our late catastrophe.

That fact seems totally ignored; for beyond the elaboration of some technicalities, the allowance of reinforced concrete (a matter which has been

*Mr. Cuthbertson was formerly City Architect. His office is at No. 1231 O'Farrell Street, San Francisco.

under consideration for some years) and the re-classification of the several styles of buildings, no changes of importance have been made in the law. The changes made are changes which ought to have been made in the ordinary course of events, and are not the outcome of any extraordinary occurrence.

It is not possible here to give the subject the proper scientific and systematic treatment it deserves, and we shall content ourselves by simply reviewing its salient and most important features, and shall not enter into the non-essential and extraneous parts of the law, such as the schedule of fees—whose unscientific and unmethodical arrangement caps the climax—the boundaries of fire and other limits, etc.

Taking up the subjects as we come upon them in the law itself, we shall consider first—the Limits.

In the law we find several limits: the "Fire Limits," "Mill Construction Limits," "Fireproof Roofing Limits," "Height Limits"; but we find no "Earthquake Limits."

After the experience we have lately gone through the non-recognition of these limits seems a capital omission.

As is well known, the made ground districts of San Francisco (which may be called its earthquake limits) were the districts where practically all the destruction of life and property occurred.

It appears, therefore, that the first amendment necessary is one describing the made ground districts of the city, and enacting that any building therein more than one story high shall have foundations going down to bed-rock, or shall have some other construction by which shocks communicated to this made ground shall be made innocuous. And that this shall not only apply to buildings, but also to all engineering works, such as water and gas mains, sewers, etc.

Anyone that can object to this amendment after seeing the direful results of allowing buildings to be placed on such ground without precautions must be wanting in all feelings of humanity; and I believe the sentiments of all worthy citizens are in accordance with such an amendment.

The statement we often hear that another earthquake of the late one's severity will not happen again for another fifty years, and therefore the present generation will be immune, and has no obligation to provide for the welfare of future generations, should have no weight, as its premises are faulty and it is founded on inhumanity and selfishness.

BUILDING HEIGHTS

The second matter that presents itself is the limit of height of the several classes of buildings.

This we will look at from two aspects: (1), as to the heights allowable in connection with the arrangement and strength of material to protect the public safety from the effects of earthquakes; and (2), the same from the effects of fire.

From the first aspect Class A—the steel frame building—has been found all right as far as it has been tested. These buildings in San Francisco are, however, as far as I know, all built upon the natural soil.

How they would act if the whole or part of the ground under and around them should sink five feet, as happened in filled-in districts, is yet to be seen, and it would be wise to provide against any such contingency.

Class B—Buildings of this class that have a frame of steel or reinforced concrete, carrying both floor loads and walls, are possibly unobjectionable; but those buildings of this class that have "walls supporting adjacent floor loads," or that have walls "self-supporting only, the floors being carried by steel or reinforced concrete wall columns," are not earthquake proof, and should never be allowed to be built as high as 102 feet.

Many deaths were due to such walls being pushed out and over by joists or roof timbers. Eighty-four feet should be the utmost limit for such construction, and no walls should be allowed above the ceiling joists of top floor.

Class C buildings are constructed in the same manner as the next abovementioned, and therefore the same strictures apply.

Wood frame buildings, when properly braced and well founded, stand the shock of earthquakes as well as steel or any other framed structures. Provisions should, however, be made for reinforced foundations and special provisions for made ground districts.

We will now look at these classes from the second aspect—that of fire destruction.

Class A buildings, although rated as fire proof, are not so while their contents are of combustible materials; therefore a height limit to Class A structures is required.

A height equal to the width of the street upon which any building abuts has been adopted by the majority of civilized cities of the world, and why should not San Francisco adopt the same rule? A city which is liable to destructive phenomena which the before-mentioned cities are not, surely should *a fortiori* adopt a rule at least as stringent. Such a rule would read something like this:

"All buildings must not exceed a height included within a line at forty-five degrees to the horizontal, commencing at the level of the street on the street line opposite to that upon which they are built."

Outside of this the necessity of fire barriers has been admitted. To form these without expense to the city an addition is required to the law—providing that on certain designated streets a space on each side, say of twenty-five feet, should not be occupied by any structure, say over eighteen feet high; the same to be fireproof. Thus will be formed a capital fire barrier, as the tall buildings will be kept farther apart and they may be run up to a greater height than if they were directly on the street line.

Van Ness avenue, Market street and Dolores street are streets peculiarly adapted for fire barriers. Others will easily suggest themselves.

Again, in regard to fire risks:

Class C buildings of the character described as buildings "with the interior floor loads supported by studded partitions or by wooden . . . . columns and wooden . . . . girders disclose a class of construction of a conspicuously vicious character, both from earthquake and fire points of view, and even when metal lathed, should not be allowed a greater height than fifty-five feet." The limit of height now is eighty-four feet when metal lathed.

As to wooden buildings from a fire aspect: The allowance of a wooden building to be of a greater height than forty-five feet at any part or portion is dangerous.

The law states the forty-five-foot height limit shall be taken "opposite the center of either front" in the case of a corner building.

This needs amendment, for where the grades of the streets slope around both fronts of the lot in the same direction a measurement taken in the center of the high side on steep streets gives an extra height of fifteen or twenty feet when the site is of large area. In such cases the height allowed for a wooden building is altogether too high.

It would be a much better proposition if the law read that a frame building at no point of its bulk should be over forty-five feet above the level of the sidewalk at said sidewalk's nearest point to said point of the building.

Shreve & Co.'s $25,000 Temporary Building
Houghton Sawyer, Architect

Having now considered both horizontal and vertical limits, we will take up:

PARTICULAR FEATURES OF BUILDINGS

The particular features of buildings which cause most deaths from earthquakes are chimneys, gable walls and parapets. This being the case one would expect some notice of these in this connection in a post-earthquake building law. But no.

Therefore it requires amendment in the following directions: No isolated *brick* chimney to be allowed in any building if founded upon the earth. Chimneys in a brick wall not to be continued above same in brick-work.

No un-reinforced walls to be built above the ceiling joists of any building or above the roof plate of same.

Experience has shown that all gable walls, including all walls enclosing a roof are found to be pushed out during a severe earthquake by the rafters.

No parapet walls allowed above the roofplate. These also are bound to fall. For the protection of people on the roof a strong metal railing is sufficient.

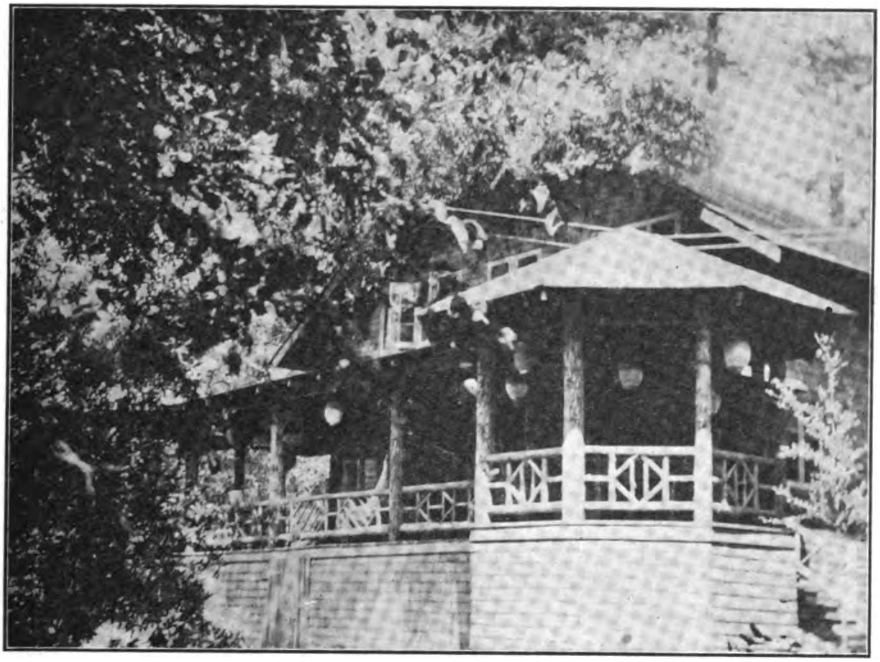
There are almost endless details about buildings and streets which the lessons of the earthquake ought to modify, but these I cannot go into. This rough outline of three prominent points should provoke some thought.

Leaving this matter-of-fact discussion, let us look for a moment at the aesthetic side of the question.

Let us compare the wide, airy, sunlit promenade and street as we see it now in Van Ness avenue, with a street lined up on both sides with those hideous monstrosities of New York and Chicago—the so-called skyscrapers, and imagine which is the most joyous, which most suited to the genius and temperament of San Franciscans, and how much enhanced the vista would be without obtrusive gables and cornices and clumsy parapet walls.

What a style of architecture could be evolved from post-earthquake ideas! Clean, simple, chaste, substantial, broad, not attenuated! A proper reflex of its people!

Nature has revenged herself—as she always does—for our destruction of her beauties when we filled up those romantic streams and glens that threaded their way through our city. Let us not be backward in taking her lesson to heart.



The Real California Bungalow. A Glimpse of the "Fernwood's" Porch in the Santa Cruz Mountains
A. W. Smith, Architect

The Real California Bungalow

By A. W. SMITH, Architect

THE California bungalow is of comparatively recent origin. Until a few years ago the misnamed Queen Anne cottage was very much in evidence, while to-day these cottages are distressingly passe, and even our workingmen, when they build a little home, try to imitate the better bungalows.

In a few years the architecture of the Golden State will appear as different and foreign to visitors from the East as the grass-roofed East Indian bungalow or the pagodas of Japan, for in addition to our many bungalows there are springing up many quaint, steep-roofed houses, having a comfortable second story, and these structures are destined to occupy a place in architecture quite as distinct as the bungalow.

The bungalow, as it flourishes in the balmy air of the Pacific Coast, is just now our especial pride. Its essential features are breadth, strength and simple beauty of plainness. It is mostly enclosed with shingles, shakes or rough sawn and wide clapboarding. There is a pleasing absence of "mill work" and other fool ornamentation, and in many cases the entire exterior finish is ordinary rough sawn redwood, which is used just as cut, and nailed in place. It must have a wide projecting roof and always has a spacious porch.

Windows there are in abundance; frequently a single ordinary room will have six four-foot windows in it, but these windows are invariably short, varying from three and one-half feet to four and one-half feet high.

Doors are always made in single pattern, being plain, with wide stiles and rails and one large flat panel.

The illustrations accompanying this article are views of a charming little bungalow home called "Fernwood," and situated at Brookdale, Santa Cruz County. It is the summer retreat of Mr. Frank C. Watson, of Oakland. Tree trunks and limbs were used as far as possible for porch railings and columns, and with natural redwood shingles the whole structure blends harmoniously with the redwood trees and forest vines that surround it.

When the Misses Watson entertain their young lady friends the dining table is set on the spacious porch, and there refreshments are served in the mellow shade of the surrounding trees.

The walls and ceilings of the rooms are not plastered, but are covered with wide rough boards with smooth battens over the cracks, and with a smooth base and corner ceiling mould. The smooth wood is waxed and the rough panels are tinted the same as plastering is tinted, affording a pleasant relief from the monotonous wall paper and plastering so conspicuous in our city dwellings.

Furthermore, these walls don't crack like plaster, you can tack up pictures anywhere or nail bookshelves and mantelpieces and have no fear of injuring woodwork or furniture.

The fireplace is made of terra cotta tile, and is large enough to take small logs. It is made with an immense flue, and when a fire is built you have a blaze that is at once cheerful, cozy and warm. There is no disagreeable smoke, either.

This description has been given because Mr. Watson's bungalow is a typical one, and because its many good features are worthy of reproduction.

We might add, in conclusion, although it has no reference to bungalows, a few words about the little Brookdale community. This diminutive settlement of about twenty homes, all more or less on the bungalow order, was organized as a sort of stock company. The various owners clubbed together, put in a water system from nearby mountain springs, a sewer system and an electric light plant, connecting with the wires of the nearest power company, so that the Brookdaler has all the conveniences of his city-caged friends, in addition to the comfort of a real, delightfully romantic bungalow.

* * *

Obliging Motorist (to groom in difficulties with horses)—"Shall I stop the engine?" Groom—"Never mind that, sir. But if you gents wouldn't mind just gettin' out and 'idin' behind the car for a minute—the 'orses think it's a menagery comin'."—Punch.

* * *

Ranter—"But, sir, a genius is a genius, whether he's rich or poor. There is no difference." Wise—"Pardon me, there is a slight difference. A rich genius can afford to let his hair grow long; a poor genius can't afford to get it cut."—Philadelphia Press.

* * *

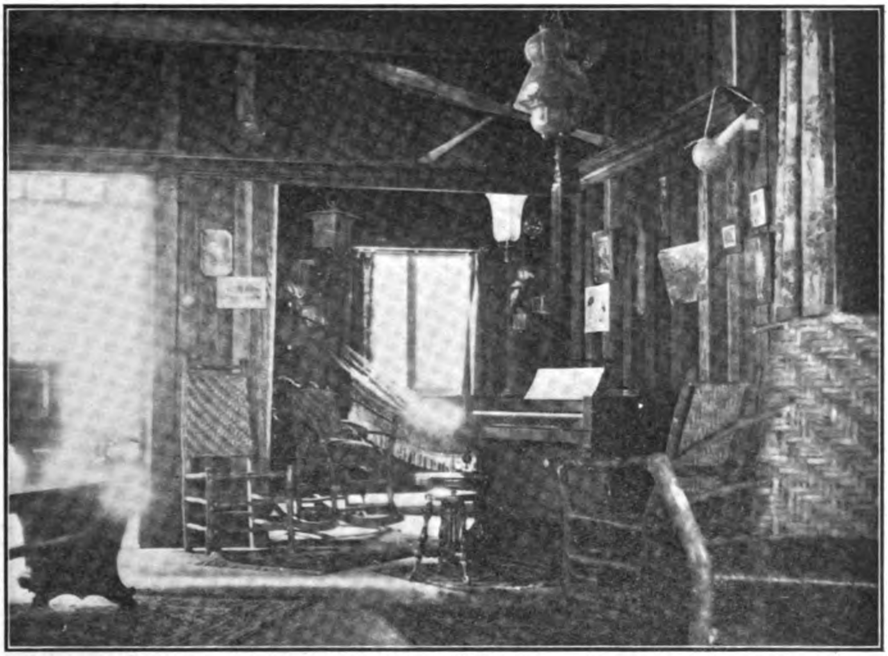
Upper-Ten Child—"My papa is abroad. Is yours?" Lower-Ten Child—"Yep. Mine is at large ag'in."—New York Weekly.

* * *

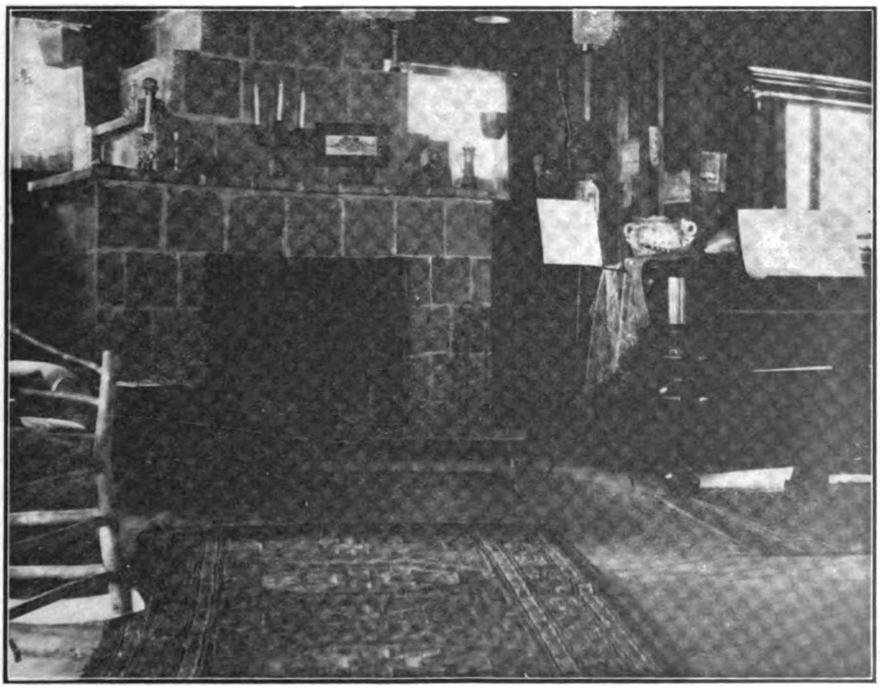
"Lady Customer (in baker's shop, to shop girl)—"Are these buns today's, because what I bought yesterday weren't."—Punch.

* * *

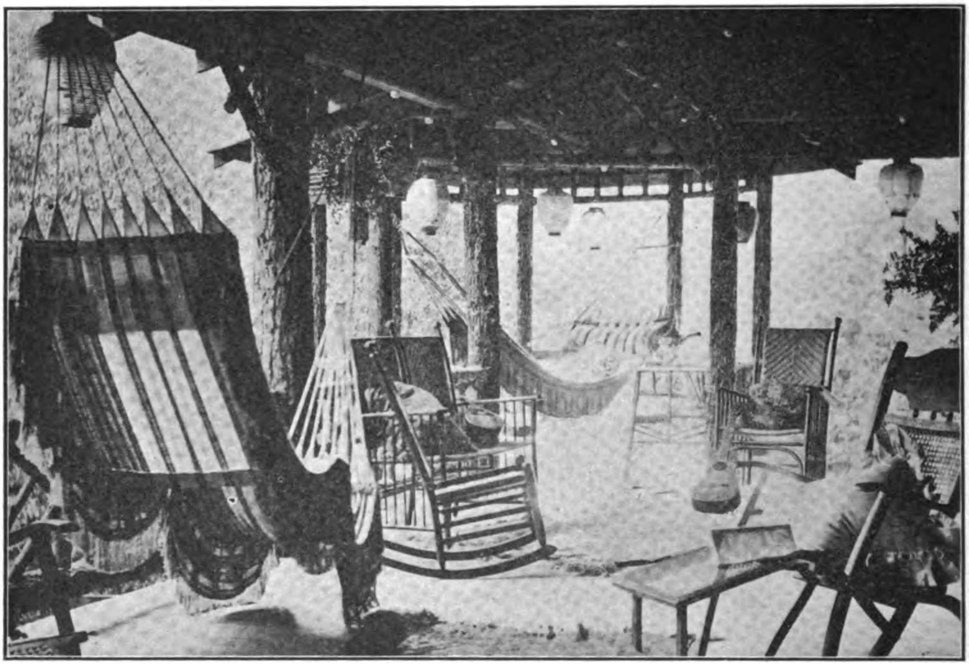
"Why, Willie, what are you crying about?" "'Cause I don't get no Saturday holiday like the other children does. Boo-hoo!" "But why don't you get out of school on Saturday?" "'Cause I ain't old enough to go to school yet. Boo-hoo hoo!"—Cleveland Leader.



The Real California Bungalow. A Living Room Corner
A. W. Smith, Architect



The Real California Bungalow. The Fireplace
A. W. Smith, Architect



The Real California Bungalow. A Picturesque Lounging Place
A. W. Smith, Architect

More Thuds from the Padded Cell

What was it made Chicago Ill?
'Twas Washington, D. C.?
She would Tacoma Wash, in spite
Of a Baltimore Md.

When Hartford and New Haven Conn,
What reuben do they soak?
Could Noah build a Little Rock Ark
If he had no Guthrie Ok?

We call Minneapolis Minn.
Why not Annapolis Ann?
If you can't tell the reason why,
I'll bet Topeka Kan.

But now you speak of ladies, what
A Butte Montana is.
If I could borrow Memphis' Tenn,
I'd treat that Jackson Miss.

Would Denver Colo cop because
Ottumwa Ia dore,
And, though my Portland Me doth love
I threw my Portland Ore?
—Maurice Smiley, in Lippincott's.

Architectural versus Engineering Requirements

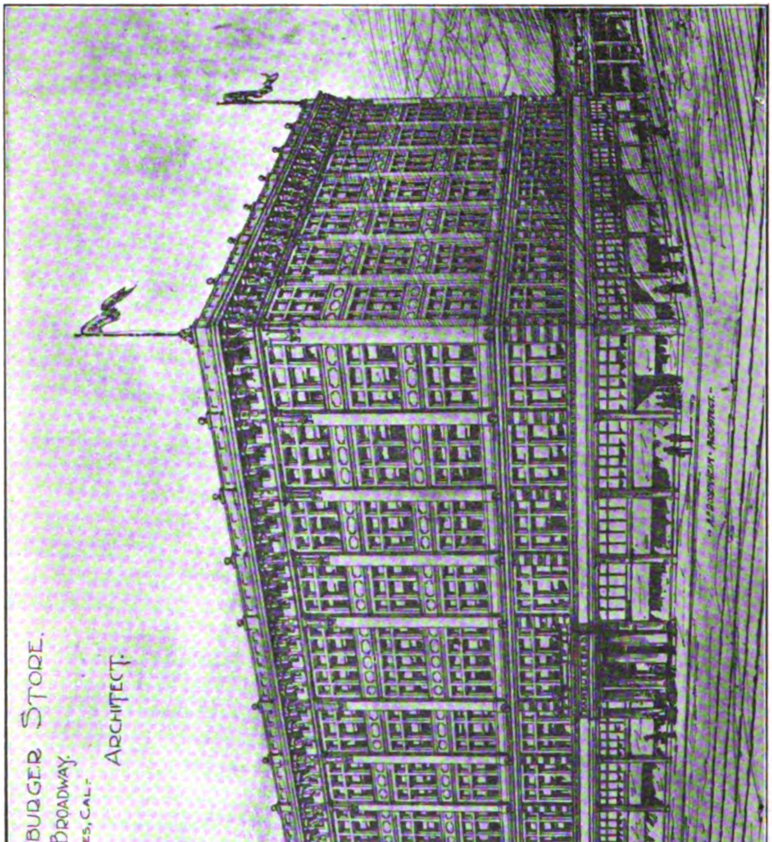
By HENRY A. SCHULZE
President San Francisco Chapter, American Institute of Architects

THE wording of the above title prompts the query: "Am I to present in a general way the various problems that should confront the architect in his practice in the designing and construction of buildings on the one hand as against the practice of the civil engineer in his vocation of designing and constructing bridges, waterworks, dams, railroads, and many et ceteras on the other—or shall I consider the subject as applying to structures intended for the housing and covering of people and their belongings?" The latter being on more familiar lines and in a sense combining the two elements though worded in opposition shall be the burden of my theme. In this, however, I am handicapped to the extent that I am unable to discover or determine where, in the phase I have chosen, the one begins and the other terminates, where the word "versus" does become a living and energetic actuality. To my thinking it has no right nor the shadow of claim in its present connection. At what period of time in the history of humanity was the parting of the ways? I have failed to find it.

The same conditions and requirements that governed earliest man in his first rude attempts to surround himself with a shield against all foes were then as today the same; the grand and glorious development of this first idea has not changed fundamentally one whit in its later concrete expression as manifested in a Florentine Duomo or an Eiffel Tower. If a seeming division has taken place, it is not real and is marked only by the sloth, indifference or incapacity on the part of a portion of one profession and the active zealousness of the other. If ease of participation in the activities of one profession until a problem of magnitude is presented justifies the title of this paper, then a note of warning must be sounded alike to both professions.

The architectural profession in this State long since was keenly alive to this and was actively interested in recent years in a legislative enactment governing and regulating the practice of architecture in California which requires that an architect, to legally practice architecture, must be certificated by the State, previously demonstrating his ability and honorable claim to a clear title by an examination. Many have failed to acquire this distinction but continue to ply their business with the support of a portion of the building public by the assumption of the title of "Architectural Engineer," hoping thus to avoid the punishment and penalty that must and will inevitably follow. If this condition justifies the title of this paper "Architectural versus Engineering Problems," it would seem indeterminate whether the architectural profession is most to be congratulated upon its loss or the engineering profession most to be commiserated upon this acquisition, in that in one profession this nondescript could not be entrusted with the construction of a chicken coop without the certainty of collapse while under the new title he is often credited with the honorable distinction of the erection of a sky-scraping office building.

If there has been a parting of the ways and therefore a legitimate reason for considering "Architectural versus Engineering Problems" and architecture is separated into a fine art and a mechanic art, then "alack the day," the grand profession of architecture has degenerated into the art of the draftsman and decorator, and it behooves the noble profession of civil engineering to acquaint itself with those subtle qualities of mind governing the highest refinement of mass and proportion and the estheticism of legitimate ornament as applied to structural necessities.



The Hamburger Building, Los Angeles
A. F. Rosenheim, Architect

A Mammoth Department Store

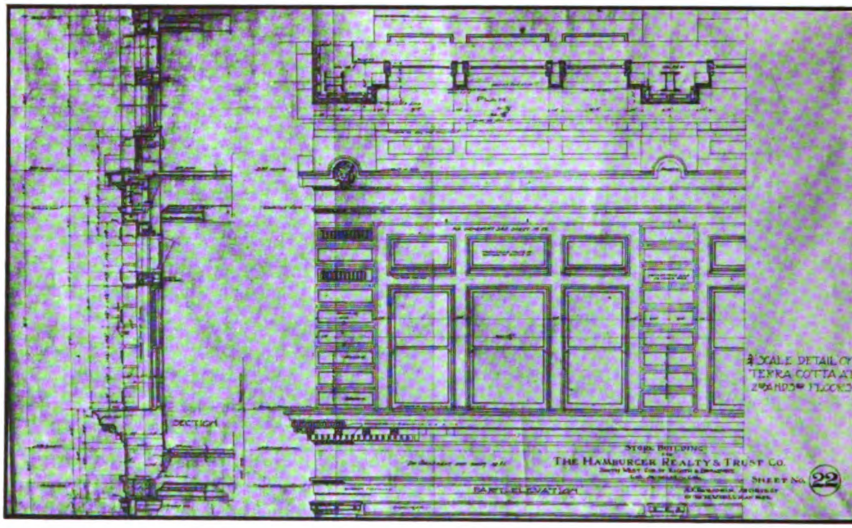
By A. F. ROSENHEIM, Architect

WITH the letting of the contract for the structural steel and front a few days ago began the construction of what will be one of the largest buildings, devoted exclusively to retail business, west of the city of Chicago. In the great "Hamburger Department Store" there will be no less than 5500 tons of steel required for the skeleton frame. This means 11,000,000 pounds of material, costing about $450,000. To convey an adequate idea of the magnitude of the building, one has but to know that this is a larger tonnage of steel than was used in the Fairmont Hotel at San Francisco and the Merchants' Exchange in the same city, together. It is more than 1000 tons in excess of the steel that was used in the Huntington Building in Los Angeles and about five times as much as will be used in the construction of the Tehama Building at the northwest corner of Seventh and Broadway, in the same city.

It is the intention of the Hamburgers to make their building a model of its kind, and with this in view they have recently made a tour over the country with their architect for the purpose of inspecting the best department stores in seventeen of the most important cities. Their building will embody the latest ideas and improvements designed to facilitate and expedite the work of handling the business.

The site, at the southwest corner of Eighth and Broadway, has a frontage of 300 feet on Broadway, 161 feet on Eighth street, with a wing or extension running through 161 feet to Hill street, and with a frontage of 124 feet on that thoroughfare, thus covering a ground space or area of 70,000 square feet. This is 10,000 square feet larger than the Huntington Building at Sixth and Main streets, Los Angeles, itself one of the largest structures in the United States. The building will rise five stories and a half above the sidewalk to a height of about 120 feet, with a twelve-foot clear basement over the entire area, and a sub-basement at the Eighth street end, having a clear height of twenty-two feet, providing an area of about 50x170 feet for the light, heat, power and refrigerating plants as well as other machinery that will be required for cooling and cleaning purposes, and the pneumatic tube system, which will be extensive. The stories will be of the following unusual heights: Twenty-three feet for the first, eighteen feet for the second and sixteen feet each for the third, fourth and fifth, while the attic will average eight and a half feet and is designed to contain the piping in connection with the heating, ventilating and plumbing systems.

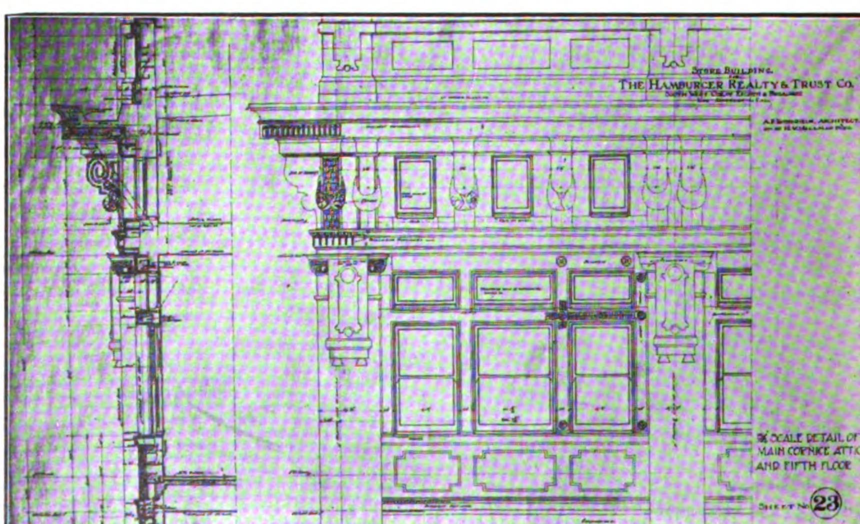
The materials to be used in the exterior are highly ornamented cast iron from sidewalk grades up to and including the second story sill course, from which point to the top of the parapet walls, full-glazed or enameled cream-colored terra cotta, the same treatment being carried throughout the Broadway, Eighth and Hill street fronts, along simple architectural lines. The interior will be finished throughout in selected mahogany. All stairways will be of steel and concrete construction enclosed in fire-proof shafts; likewise the elevators of which there will be ten as follows: Six exclusively for passenger service, with cars of unusual size designed to carry from twenty-five to forty people. Two exclusively for the use of employes and two exclusively for the use of freight, which will be handled directly from the large transfer company's trucks at the south end of the Hill street wing, where they will have ample room to back in under cover. The freight cars will be six feet by twelve feet each. The type of elevators



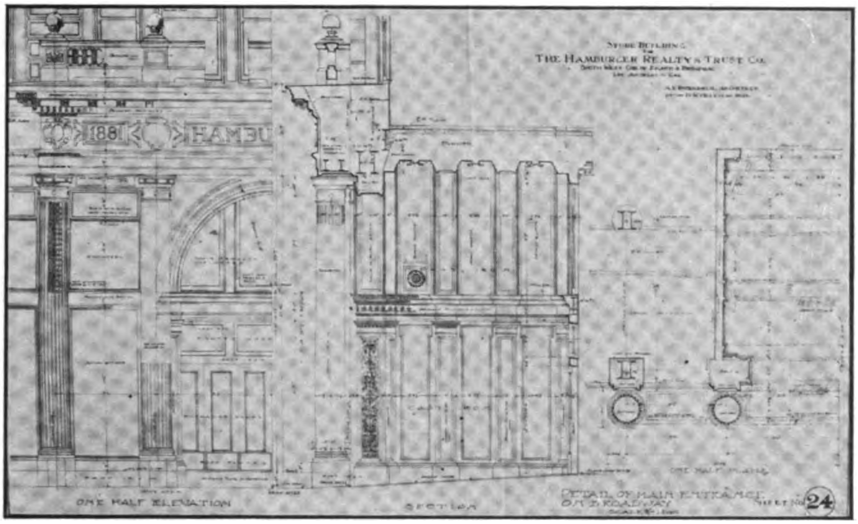
The Hamburger Building, Los Angeles. Terra Cotta Detail
A. F. Rosenheim, Architect

to be installed has not yet been determined, but it is safe to say that they will be of the latest and most approved pattern, equipped with all safety devices known to the leading manufacturers.

In addition to the elevators, it is the intention to install a series of "escalators," or moving stairways, extending from the first to the top floor, and by means of which people can be carried to the upper floors at the rate of 4000 per hour, far exceeding the capacity of all the elevators. There will be a gravity package conveyor connecting with all floors and terminating in the shipping room in the basement of the Hill street wing.



The Hamburger Building, Los Angeles. Cornice Detail
A. F. Rosenheim, Architect



The Hamburger Building, Los Angeles. Detail of Main Entrance
A. F. Rosenheim, Architect

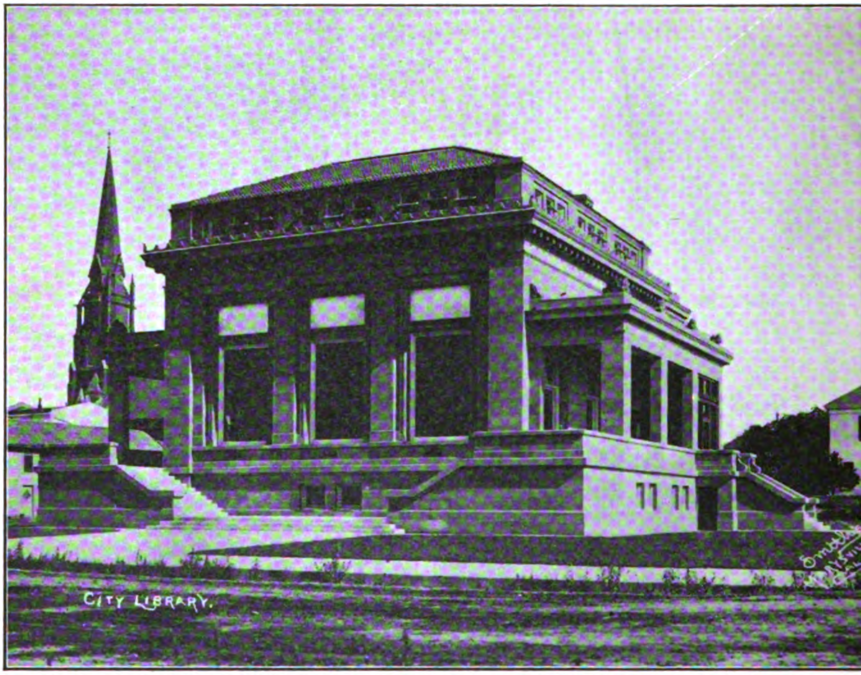
In connection with the shipping department there will be a city delivery for which unusual arrangements have been provided. The wagons will enter directly from the street into the basement by means of an inclined plane located at the north end of the Hill street wing, entrance and exit being effected in the same manner.

Plate glass *only* will be used in the windows throughout and, where openings occur on dividing property lines, they will be furnished with steel frames and sash and obscured wire glass, making them absolutely fire-proof, so far as the external effects of heat are concerned. The doors in the elevator and stair shafts will, in like manner, be provided with wire glass polished so as not to obstruct the view. The floors throughout will be of selected white maple, in narrow strips. Plaster of Keene's cement will be employed and all ceilings will be sub-divided into panels by means of plastered beams running longitudinally and transversely on the lines of the columns, all of which will be circular and finished with an ornamented cap directly under the beams. The steel frame of the building has been designed of sufficient strength to permit of the erection of two or three additional stories at some future time, bringing the height of the building up to the full limit allowed by the city ordinances. The cost of the structure exclusive of the interior, counters, shelving, show cases, lighting fixtures, decorations, etc., will be approximately $1,250,000. The fixtures, themselves, which it is proposed to construct of mahogany, will increase the cost to $1,500,000 in round figures.

The excavation and foundations of this mammoth structure are under contract to Carl Leonardt. William H. Bryan, of St. Louis, Mo., has been associated with the architect as consulting engineer in the design and construction of the light, heat and power plant.

* * *

"I want to know," said the irate matron, "how much money my husband drew out of this bank last week." "I can't give you that information, ma'am," answered the man in the cage. "You're the paying teller, aren't you?" "Yes, but I'm not the telling payer."—Chicago Tribune.



Marysville Free Library of Reinforced Concrete
William Curlett, Architect. Maurice Couchot, Engineer

Interior of Marysville Free Library
William Curlett, Architect. Maurice Couchot, Engineer

What Neighboring Architects Suggest for the New San Francisco

IN a recent issue of The House Beautiful some space is devoted to publishing expressions of various architects of note throughout the country on the rebuilding of San Francisco. These views may appeal to the San Francisco architect and builder as having been worked out by the authors more from a theoretical than practical standpoint. Without commenting on the good or bad points brought out by these learned gentlemen—our Eastern brethren—the Architect and Engineer reprints herewith extracts of the opinions which will be found interesting if nothing more:

Russell Sturgis, of New York, writes: "The important thing in rebuilding a city, as in building a new one, is to design and complete attractive buildings. That is what Chicago and New York, Boston and Baltimore, are without—or so nearly destitute of that exceptions do not count. If you can persuade the owners of property to employ architects of some training and much originality of mind, and if those architects, once employed, will go to the spot, work out their designs, and produce for each house the best that can be thought of under the circumstances, you will provide what San Francisco needs, and what all of the villages and towns of the United States need equally.

"Any attempt to carry out schemes of uniformity of style will be giving the unnecessary, the fanciful, the non-artistic result in the place of the seriously important one. It is like the ornaments—the vases and statuettes —in our sitting rooms: if they are fine in themselves, and especially if they are fine in color, they suit one another marvelously—oriental and modern French, ancient Greek and modern American amateur experimental, all go together in a wonderful way. And if you would remind me that the owner of these gimcracks has of necessity some taste in their arrangement, and that this arranging is just what cannot be done to houses in a street, I remind you in return that the houses in the street have natural foliage to lend its powerful aid in harmonizing them."

Myron Hunt, of Los Angeles, writes: "I had but one residence in the earthquake district, and have just returned from its examination. It is situated on Russian Hill, which is next to the highest point of rock within the city of San Francisco. Owing to the size of the property and to the existence of a large amount of barren rock surface in the immediate neighborhood, this residence and seven others are the only buildings within a radius of more than a mile which were not touched by the fire.

"The residence is that of Mr. Livingston Jenks, formerly of Chicago. It cost approximately $40,000 and was built by day's work. Neither labor, material nor money was spared in the erection of the structural part of the building. It was occupied at the time of the earthquake. The entire rock upon which it stands was swayed to an extent which made it almost impossible for the occupants to get from one room to another. Pictures, statuary and bric-a-brac were thrown about indiscriminately. Nevertheless $25 will repair the damage done. There are three cracks less than one foot long, which appeared in two rooms. The cracks are at the bases of segmental arches, and are no worse than shrinkage of timber might have produced. The chimneys were laid in cement and are entirely intact. The two and one-half story vaulted hall (plastered on framework, the wood-lath reinforced at all angles with one-half-inch mesh chicken-wire before plastering) is entirely without cracks. The plastering is three-coat work, ordinary lime material, tempered with 10 per cent of imported Keen cement.

"My conclusions are that all forms of construction, when thoroughly carried out, will continue to prove safe for San Francisco; that the steel frame or reinforced concrete construction is the most safe, both against loss of life and damage to property, but that in putting up steel frames and reinforced concrete structures, architects will in the future be more strenuous in insisting upon at least one full cross-wall in each direction, made of solid masonry, with the idea of furnishing an interior structural brace against the twisting motion of an earthquake. Such walls undoubtedly saved the veneering on the exterior from being cracked or thrown down by the whipping and twisting motion produced by the earthquake.

"The loss by the earthquake impresses a visitor as being less than he expected, but the loss by the fire is greater than any written description can make an outsider comprehend."

From Donn Barber, New York: "Any investigation of the real effects of the earthquake upon the buildings of San Francisco is difficult, and the results are unsatisfactory. The testimony of eye witnesses is most unreliable, owing to the state of panic and the need of self-preservation which existed at the time. No cool-headed and scientific observation was possible. We shall, therefore, probably be forced to depend upon the silent testimony of the relics of the disaster; and here again we, as architects and engineers, are hampered and obstructed in our researches by the complications due to the subsequent action of fire and dynamite. Even if the effects of this particular earthquake could be clearly read, it would not be safe to conclude that the action of those in the future will be the same, so different are they in their movements of upheaval, sliding or rotation. It would seem, therefore, that we are forced back upon theory to determine what class of buildings will best withstand the shock and the unequal settlement or upheaval of their foundations.

"A few facts, however, seem to stand clear of the mass of uncertainty. The great destruction by fire has once more shown us that the fire-proof building cannot resist the concentrated heat of a surrounding mass of burning buildings. We have advanced sufficiently in the science of fire-proof construction to make our buildings safe from any fire which may originate within their walls, but we have not yet reached the point where we can construct buildings which will not succumb to the terrific heat of burning buildings on all sides. This has been demonstrated again and again. It is too much to expect that the entire city, or even any one great section of the new San Francisco, will be of fire-proof construction, but it is to be hoped that the city will, at least, be divided into many sections by lines of fire-proof buildings separating the areas given over to inflammable or slow-burning buildings, each from the others. This would prevent the irresistible sweep of the flames; while the sections in which fires originated might be totally destroyed, the neighboring sections would not be affected.

"The great danger to life in an earthquake is from the falling parts of buildings and, while it is probably not within the bounds of human effort to prevent all loss of life, it is certainly possible to lessen the loss. It would seem, therefore, that the following very general precautions should be taken in the rebuilding of both the residential and the business sections of the city.

"Any system of construction adopted should be sufficiently flexible or elastic to permit the building to adjust itself, within reasonable limits, to an unequal settlement of its foundations and to sliding or vibratory motions of its parts. To this end steel would seem to be the ideal material, for it is possible to construct a building of steel which will withstand almost any strain and adapt itself to all manner of deformation. The steel frame of a building should not be rigid; the columns should be as few and as far apart as possible, so that in the case of unequal settlement the angle of distortion will be less than in shorter spans; and the connections and joints of the columns, beams, etc., should be flexible instead of rigid. All bracing should be curved instead of straight, so as to add to the elasticity of the structure. In other words, the building should be no stiffer than is necessary to withstand the wind pressure. The floor beams should be as close together as possible and should be connected by closely placed tie rods. The floor arches should be reinforced in such a way as to guard against cracking and falling. Steel should everywhere be fire-proofed with cement on wire lath.

"Stairs should be built of wrought iron, steel, or very heavily armored concrete, and should be located if practicable, on an outside wall and as near the exit as possible. Projections of masonry over the street, such as cornices, balconies, etc., should be avoided, and if used at all, should be supported on a steel skeleton securely attached to the frame of the building.

"Water and gas pipes, both interior and exterior should be placed in ample ducts and should be furnished with expansion joints, or loops, to avoid rupture. All exterior pipes and conduits should be kept as far from the columns as possible.

"Walls should be as thin as the structural condition will allow, should be supported at every story on girders or beams, and in every case should be anchored to the framework.

"Reinforced concrete will probably be very largely used, but should be employed with caution because it is in an evolutionary and experimental stage of development. Large monolithic slabs of whatever material used should be avoided on account of the possible cracking and crumbling under great shock.

"In other words, the fire units and the units of construction should both be kept as small as possible."

Wilson Eyre, Philadelphia: "Regarding the rebuilding of the residence portion of San Francisco I would say that beyond the planning of a general big scheme, such as streets, parkways, public points of interest, etc., it would be dangerous to venture. I am a great believer in individuality, and I think that the interest and picturesqueness attached to much that one sees is owing to individual growth and conditions. I have always been opposed to any censorship in matters of art. A strict supervision and guidance over cornice lines, color scheme, etc., can be satisfactorily handled in the planning and designs of an exhibition, or a fair, or of some pleasure grounds, but where many individual tastes and needs are to be consulted I think too many restrictions are dangerous, if not impossible.

"This is a very large subject and could be gone into much more exhaustively, but I think I have outlined my ideas roughly."

* * *

Circular fireproof stairways represent a farther adaptation of fireproof tile to modern building. In the New York custom house two pairs of semi-circular fireproof stairways have been built leading from the sub-basement to the top floor. In many respects these stairs represent an extreme advance in the fireproofer's art. They consist of hard burnt tile slabs built up in the form of the arch so that they are self-supporting and entirely secure against any damage from fire.

* * *

Fireproof domic ceiling is but one of the several recent uses to which terra cotta burnt tiles have been put. The tile dome is even more interesting. It suggests even more pertinently than the domic ceiling the fear of collapse.

Monument Erected at Van Ness Avenue and Market Street, San Francisco, in Honor of the California Volunteers

Douglas Tilden, Sculptor

Terra Cotta and Brick

Thinks Terra Cotta Tiling for Floors a Failure

By JOHN D. GALLOWAY

I HAVE no hesitation in saying that, considered as a material to form a floor which shall have a reasonable degree of fire-resisting qualities, terra cotta tiling is a failure. As the fire which succeeded the earthquake has obliterated most of the earthquake effects in such materials, it is questionable just how well the terra cotta tiling resisted the earthquake. I am of the opinion that the racking of buildings by an earthquake would start the joints of tile arches.

There was one building at Stanford University, that is, the additions to the Museum, where tile arches were used for floors and which now seem to be in a reasonable state of repair. This last observation is contrary to my former statement, but the building in which this terra cotta flooring was used was a low, two-story structure. Aside from this, I have not seen any building with terra cotta floors which was not burned after the earthquake. Hence, such statements must be an opinion only.

The evidence in favor of this material in those buildings subjected to fire was not of the best. In the Mills building, the floors were all practically destroyed and must be taken down. The principal effect of the fire seems to have been the disintegration of the mortar joints and a spalling of the lower face of the tiling. Similar effects were observed in the Union Trust Company's building and in the Crocker building, but with what damage to the floor, as a whole, I am not able to state. The floors of the James Flood building were of terra cotta tile, of the true arch form. This tile was practically uninjured excepting on the first and second floors. Here the damage was principally the spalling of the lower face of the tile. It is necessary to state, in this connection, that the tile arches were protected on the under side by a well built, plastered ceiling, on wire lath. On the upper side, they were covered with concrete and, hence, were not exposed to quite as severe a test as the other floors mentioned.

It is my opinion that for floors in buildings having a steel frame, with the ordinary steel beams and girders, there is nothing better than concrete. Any number of examples exist of this character of flooring, which stands today in practically as good condition as before the fire. Among such buildings may be mentioned the St. Francis Hotel, the Shreve building, the Mutual Savings Bank, the Merchants' Exchange and others of similar construction. There seems little to be desired as an improvement in the construction of such floors. Concrete thus built, with a web of metal reinforcement, is apparently the best thing that can be found at present. About the only objection to it is the fact that in San Francisco there are no cinders with which to build a light concrete. The new Building Ordinance contemplates the use of broken brick and broken terra cotta for such purposes, and in short spans this is believed to be as good as cinders.

Regarding the so-called long-span construction, there were few examples of this type of floor subjected to fire. In the Young building, on the corner of Spear and Market streets, there were concrete floors having a span of some sixteen feet. Intermediate beams were formed by iron straps, which were fastened to the steel girders by being bent over the same. These iron straps hung in the form of an arc and supported directly a concrete beam. While theoretically not a beam at all, it must be stated that this type of construction stood the fire test very well. Another example of such floor construction is that of the Academy of Sciences building, constructed a number of years ago on the Ransome system. With the exception of a few spots where the concrete spalled off on the lower side, leaving the rods exposed, this floor is intact and the building would be as good as ever, structurally, if the brick walls had not been shattered.

A number of types of floor construction, combining the reinforced concrete beam with reinforced concrete girders or with steel girders, are on the market. So far as sustaining power against vertical loads is concerned, such floors are ample for the purpose designed.

Going a little outside of the subject of this short paper, I would say that the principal problem of the designing of such floors seems to be that of making such connection with the vertical sustaining members that the structure as a whole will resist the horizontal strain due to an earthquake. If due consideration be given to such horizontal strains in buildings of moderate height or over, some devices are necessary to take care of the diagonal stress which necessarily arises when an earthquake or the wind shakes the building. Any such design must have something to do with floor construction, and may result in bringing about a modification of the present methods.

In conclusion, I desire to state that it does not seem to me necessary to hunt farther for a different material for floor construction. Concrete has proven itself amply sufficient to withstand the test put upon it by the earthquake and fire. Having been found good, there seems to be no reason for searching farther.

No statement is made regarding wooden floors, because I believe the wooden floor to be bad in nearly every respect. I believe that if the architects made proper representation to their clients, the slight difference between the cost of a wooden floor and the cost of a concrete floor would allow of the better floor being constructed in all ordinary cases.

* * *

Bricklayers of Thirty Years Ago

APROPOS of the discussion which was carried on in these columns some months since relative to the amount of work which the average carpenter of the present day ought to be able to execute, it is interesting to note the plaint of a builder who was actively engaged in the business something like thirty years ago. In a communication to a recent issue of the Record and Guide he sets forth his views in the following words:

"When I look back to the good old days when men worked and compare the conditions as at present existing, I feel that notwithstanding what some say about the benefits of unionism the detrimental effect of organization upon labor is very great.

"Thirty years ago a bricklayer was ambitious to become a lineman; it was the builder's custom to pick out his best men and put them on each end of the wall; they were in charge of the line; as soon as they had laid up the ends they called 'line' and raised the line for the next course. The men in between were compelled to work at a speed set by the linemen, and failing to keep up with them were considered less worthy and were retained only as long as was absolutely necessary. The men who were able to keep up with the linemen were most steadily employed.

"A builder watching his men at work was enabled in a few minutes to figure how many brick could or would be laid in an hour, and by using the same linemen on his work he had a good idea of the result in advance as far as his labor was concerned. These linemen did not work at their top speed, but assumed a steady gait and expected the others to keep up with them. The men in between were ambitious to become linemen, and the net result was a steady, conscientious amount of work which today is absolutely unknown.

"A man who laid 3000 brick a day was not an unusual man, and there are some men in the building business still who tell of 4000 to 4500 brick for ten hours. Today 800 brick in eight hours is considered an average day's work.

"What has caused this condition? Men are just as strong as they were; men are just as intelligent as formerly, but a rule of the bricklayers' union has come between the ambitious man and his employer. If the lineman calls 'line up' before the other members of his union on the wall are ready he is reported to the union and fined $25 for the first offense and $100 for further violation of this union regulation. In other words, the slowest man sets the pace for all the others, because he is a member of the union and must be protected in his laziness and indolence.

"What incentive is there for a man to be better or more competent than another, when he is threatened with losing a week's pay if he does not keep down his speed?

"A builder can employ only members of the union, and in busy times there are not enough men of any kind to do the work, to say nothing of their incompetency. Apprenticeship is limited and the supply of mechanics in every line is decreasing in direct proportion to the increase of the amount of work to be done. Something is certainly wrong; wages are increasing, hours are decreasing, the amount of work to be done is multiplying many fold, and to cap the climax the union limits the amount of work a man may do.

"Formerly a good man was paid more than an inferior man; the good man saved some of his surplus earnings and eventually started in business for himself. Today the statement is heard on every side that the mechanic cannot advance the way he did in the olden days; that once a mechanic always a mechanic; simply because a good mechanic is as poor a mechanic as the poorest; they are brothers in the union and the union comes first, ahead of ambition, ahead of conscience and almost invariably ahead of the family."

* * *

Use of Peat in Brickmaking

IN Germany they are mixing coal and peat, making a compressed mixture, which has been used as fuel in a brickyard with a result so favorable that it will no doubt open a new field for the use of peat fuel in brick manufacture. In the neighborhood of Jevers, Oldenburg, an excellent heavy blue clay is found which was considered suitable for the manufacture of hard clay paving bricks. All efforts to manufacture such bricks from this clay proved unsuccessful until a mixture of one part of peat and ten parts of coal was tried as fuel. The result was a hard, brown brick instead of the light red brick which was produced formerly. The experiments were repeated until at last a first-class brick was produced. So much for fuel in brick building.

Oakland Bank Building of Brick and Terra Cotta
C. W. Dickey, Architect

Brick That Will Stand Fire

BRICK that will withstand all heat and cannot be burned with fire are soon to be manufactured in Monterey. Luke Houze, president of the Monterey Glass Works, claims to have discovered a method to make brick which is absolutely fire-proof. The brick cannot be burned from the outside and will extinguish the flames that start on the inside of the building. Mr. Houze has been experimenting with the manufacture of brick for many years and he has at last perfected a substance which he believes will revolutionize the brick industry in California and make the construction of fire-proof buildings a fact.

Some time ago a committee was appointed by the Merchants' Association of Monterey to investigate the conditions under which Monterey might offer factory sites and other advantages to manufactories desiring to locate on Monterey bay. The committee held a meeting and found that their invoice of stock on hand consisted of one of the best harbors in the world, excellent railroad facilities, cheap fuel, in the shape of oil at 55 cents a barrel, and an equable climate where an operator could produce 20 per cent more of manufactured products than in climates more severe, owing to extremes of heat and cold.

The committee then went out to the site of the Monterey Glass Works and interviewed the president of the company, Mr. Houze. He showed them a brick that he stated was fire-proof in the fullest sense of the word, and also possessed other qualities and some were as follows:

It was a non-conductor of heat, cold, sound and moisture, and also could be used as an insulator. It was about one-third of the weight of the ordinary building material. It would neither expand, contract nor explode under extremes of heat or cold or when deluged with water under either condition. The material from which the brick was made—magnesia and silice rock—existed in large quantities in the Monterey peninsula and was of easy access and the cost of production was small. This material could be furnished as a building material as cheaply as the cheapest building material on the market. It could be furnished in granulated form, in sacks or barrels and mixed upon the ground where the building was to be erected. Nothing but cold water and ordinary skill would be required in mixing it. It could be pressed into brick form and used for building purposes, both for the walls and floors of steel structures. It is invaluable as a material for building partitions, being a non-conductor of sound and of light weight. The committee obtained a brick of this material that had been moulded by hand for their inspection. They applied heat to one end of this brick, that was two inches in length. The amount of heat was about 2000 degrees, and after ten minutes of exposure to this heat, Mr. Peterson held the brick in his hand without any inconvenience to himself, holding it by the opposite end from that to which the heat had been applied. The brick was only two inches long. This material under this terrific heat did not expand nor contract nor change its shape in any manner. Mr. Peterson then plunged the brick into a bucket of water and the only change noticeable was a slight glazing or a vitrification of the spot where the heat had been applied. In fact, it was a better brick after the experiment than it was before, having become firmer.

Mr. Peterson declares there would have been no ruined safes or vaults in San Francisco had two or three inches of this material been used as packing for the safes or casing for the vaults.

The magnesia and silice rock after it is mined is crushed and pulverized and mixed with secret ingredients. It is then pressed into bricks and allowed to dry in the air. It sets rapidly and can be used in three days after it is manufactured. It is not cooked like the ordinary brick.

Mr. Houze states that if a room which was lined with this brick took fire the contents of the room would burn, but the fire could go no farther, as the brick would prevent it. Ceilings lined with this brick would stand intact and would not relax nor contract with the heat as was the case in the San Francisco fire. The fire-proof walls would confine the fire to the room and it could not spread. Even if there were steel girders across the ceiling and these were lined with the new brick the steel would not get warm, as the brick is a non-conductor of heat.

* * *

Tile Construction

By W. E. DENNISON, President of Steiger Brick and Terra Cotta Co.

THE fact has been clearly demonstrated that here in tile construction is to be found a system of fire-proofing which cannot only be installed in less time than is required by any other system, but also at much less cost.

Tile construction will answer every requirement and condition of a truly fire-proof building. It does away with the use of structural steel and the noise which would result in the assembling of members and in driving of rivets.

The discarding of steel frame work also lessens the cost by one-half, and the time taken in manufacturing steel will be three times as long as that of making tile; whereas work can be started immediately with this system.

The exterior walls are built entirely of hollow tile, the floors being of long span hollow tile construction, reinforced with steel bars, and reinforced columns and girders of concrete.

Eight, ten or twelve-inch tiles, varying in depth according to span, are placed between the lines of concrete joists, which have a uniform width of four inches.

Besides greatly lightening the construction, this system has the advantage of giving a drier floor and one more nearly sound-proof. But the remarkable distinction is realized in the shorter time occupied in erection over that consumed by any system where a solid concrete slab is used.

The outside surfaces of these wall tiles are made with a depressed groove which gives a very strong bond to the plaster. The double air-chamber of the tile makes impossible the conveyance of moisture through the wall.

One of the greatest advantages gained is the elimination of inside wall furring, the plaster being applied direct to the tile.

Many other advantages are gained, such as the greatly decreased cost of insurance and repairs, and the more satisfactory insulation of heat and cold. The structure taken in itself would be virtually monolithic.

The treatment of the exterior may be varied by the use of colored tile, terra cotta panels or spandrels.

Summed up, the advantages of this system are: Fire-proof, time saved in erection, cost saved in erection, light construction, dry floors, sound-proof floors, moisture-proof walls, elimination of furring, and decreased insurance.

* * *

Brick Famine at Salt Lake

CONTRACTORS in Salt Lake, Utah, are on the anxious seat owing to the scarcity of brick in the local markets. According to their statements and of architects, practically every job in Salt Lake City is being held back, if not absolutely brought to a standstill by this brick famine, and architects say it may last for the next sixty days. The scarcity appears to be mostly in finished brick, for which there is a steadily growing demand, and if there is not enough of this everything else has to stop.

The brick men admit the scarcity, but call attention to the fact that with 11,000,000 brick on hand at the beginning of the season, the great smelter at Garfield took 8,000,000, and is likely to require 8,000,000 more. Then there is yet another smelter to go up at Murray that will require 2,000,000 brick. All this with the constantly growing demand in many other directions for general building is making things warm for the brick makers. But it is claimed that the four large brick plants and the smaller affairs in the valley are now turning out 375,000 brick a day, so that in the course of the next thirty days the stringency will be relieved.

The brick men say that the prolonged wet weather spoiled a great deal of brick in making, so that for a time filling orders for special classes of finished goods was almost impossible. But by another season the local plants will be in such shape that bad weather will have no effect on them. The Salt Lake Brick Company, for instance, is completing a $60,000 plant, about 800 feet long and five rods wide, which will turn out 200,000 brick per day without trouble, and with no delay on account of weather. The brick makers claim that they will be able long before fall to fill all orders without delay, and that the agitation for an increase in the number of present plants is unnecessary.

Cement and Concrete

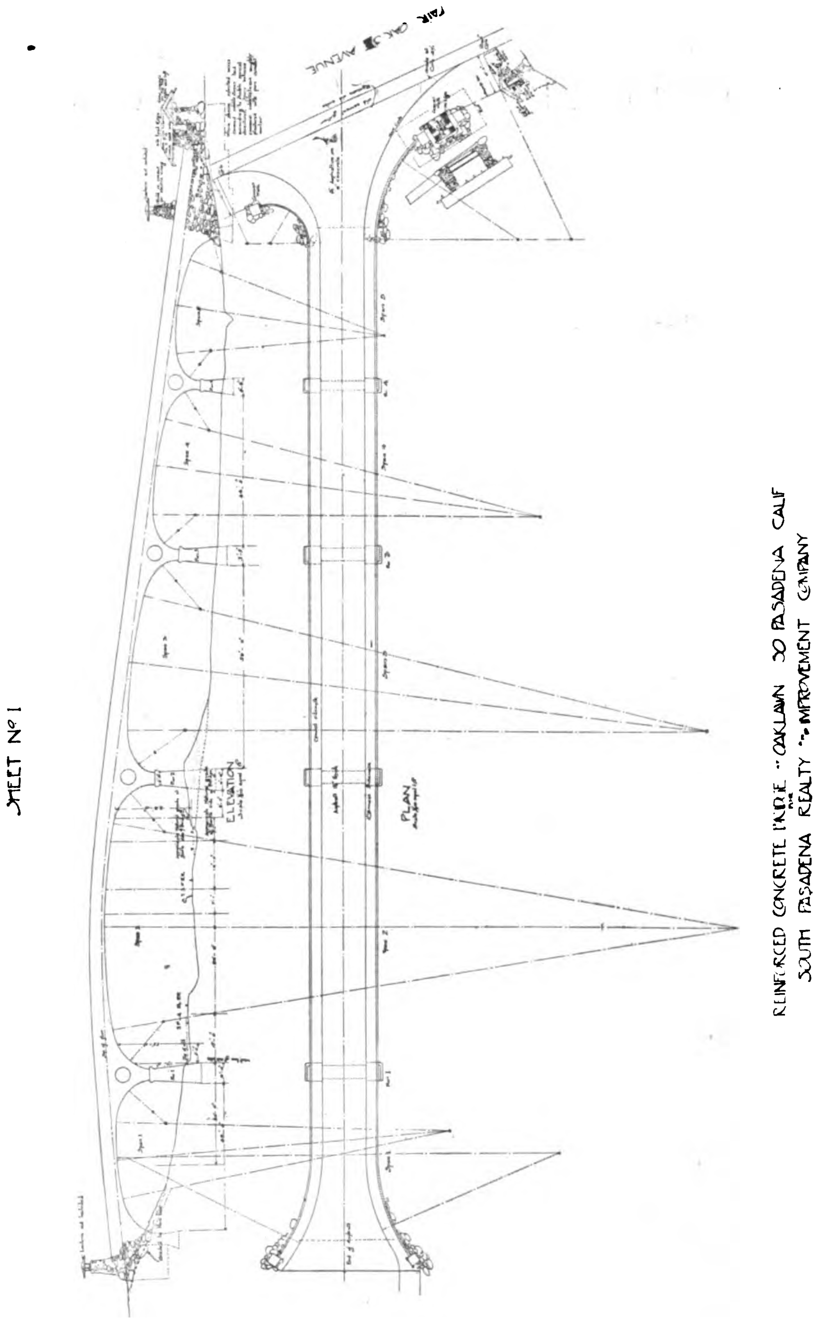
A Discussion of a Reinforced Concrete Arch

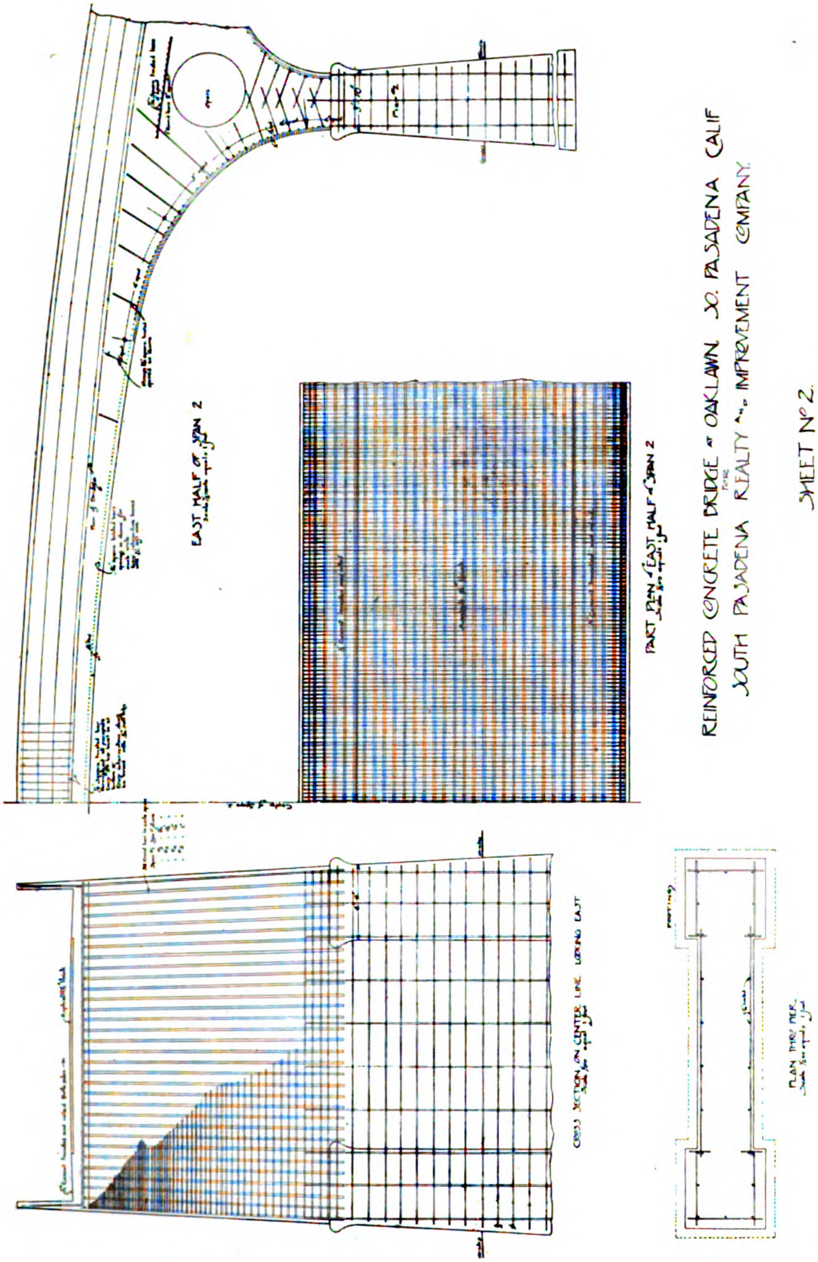
By A. V. SAPH

THE reinforced concrete arch bridge recently constructed at Oaklawn, South Pasadena, California, for the purpose of affording passage over the lines of two railroads consists of five arches of variable span and rise. Each of the arches is five-centered. The clear spans are about 45 feet, 82 feet 6 inches, 62 feet, 46 feet 6 inches, 41 feet 0 inches, and the rises are about 11 feet, 14 feet, 10 feet, 9 feet, 9 feet 6 inches for arches 1, 2, 3, 4 and 5 respectively, these figures having been scaled from the drawing, definite dimensions being absent. The depth at the crown of the arch in each case seems to be about one foot. The clear roadway is 19 feet. The reinforcement consists in each case of 32 rods placed longitudinally 2 inches from the intrados and extending down about 1 foot below the top of the coping around each pier. These rods have diameters of 1 inch, 1½ inches, 1½ inches, 1¼ inches and 1 inch for arches 1, 2, 3, 4 and 5 respectively. The piers are reinforced with vertical rods spaced 2 feet 9 inches and horizontal rods spaced about 1 foot. An elevation, plan and details of this structure are shown in this number of the journal.

The bridge is, however, particularly interesting at present on account of the partial failure which has taken place. Cracks have appeared in the arches, and these, according to late information, extend to within 6 inches of the intrados in arches 2 and 3, and to within 1 foot of the intrados in the others. The accompanying photograph shows one of these cracks, and from this photograph the nature and position of the other cracks may be judged, since other pictures not presented are very similar. These cracks are open at least ¼ inch in the morning, but are closed later in the day, and it is not going too far to anticipate that total failure may be impending from the continual hinge action on the still uncracked portions from changes in temperature and the more frequent action of passing loads. It is interesting, however, to note that since the cracking occurred, the center arch has been tested with a load of 18 tons and there occurred a deflection at the center of 3-16 of an inch.

These cracks in the arches are undoubtedly due to the setting up of tensile stresses along the extrados of the arch with no provision in the way of reinforcement made to take them. These tensile stresses may be induced either by a condition of loading or a fall in temperature, and these may act separately or simultaneously. This absence of reinforcement is a point that immediately attracts attention upon inspection of the drawing, to one who is familiar at all with the examples mentioned


SHEET No 1
FAIR OAKS AVENUE
ELEVATION
PLAN
REINFORCED CONCRETE BRIDGE • OAKLAWN SO PASADENA CALIF
FOR
SOUTH PASADENA REALTY & IMPROVEMENT COMPANY


EAST HALF OF SPAN 2
PART PLAN of EAST HALF of SPAN 2
CROSS SECTION ON CENTER LINE LOOKING EAST
PLAN THRU PIER
REINFORCED CONCRETE BRIDGE AT OAKLAWN SO. PASADENA CALIF
FOR
SOUTH PASADENA REALTY AND IMPROVEMENT COMPANY
SHEET No 2

from time to time in the engineering papers, which uniformly provide such resisting material. Usually this reinforcement extends over the whole span, even though the conditions may not demand it for such a length. There is, however, a need for reinforcement extending from a point directly over the pier to a point well toward the center. The conditions in the present case are similar to a beam at least partially fixed at the ends extending between those points where the section begins to increase rapidly.

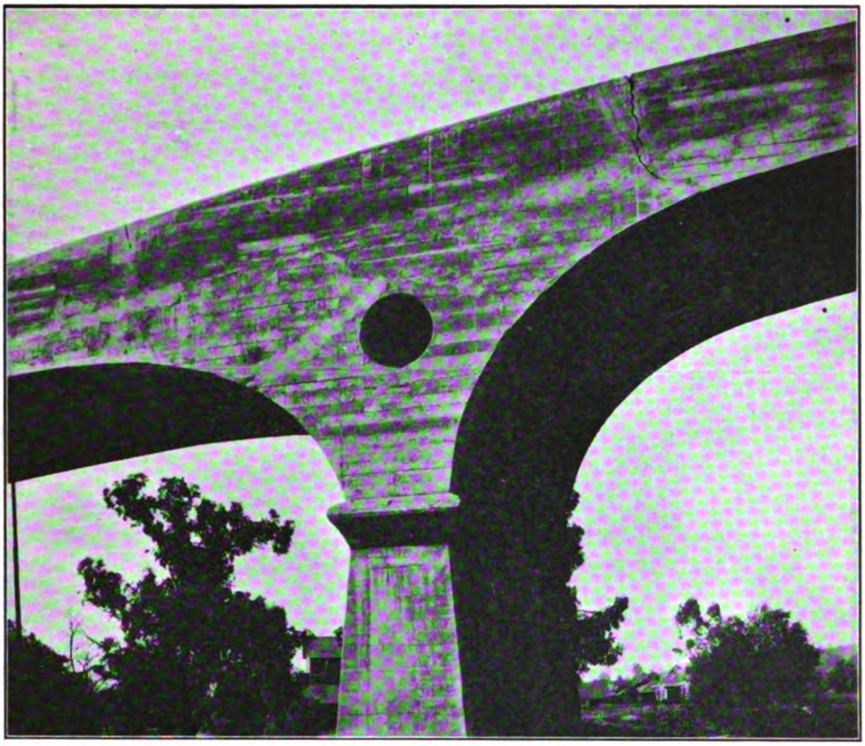
The conclusion that the reason for the partial failure is to be found in the omission of this upper reinforcement, as stated, is strengthened by the fact that not only one, but all, of the arches cracked, the cracks being similar and similarly located. Since these arches acted so consistently, the arches must each have the same inherent defect, which could have been avoided in the design by a complete analysis.

Aside from the absence of extradosal reinforcement, which is the great apparent defect in the design, several other criticisms seem to be in order. The amount of material called for in the way of rods laid transversely is decidedly excessive. The rods called for by the design are 7-16 twisted rods spaced 3 inches apart at the crown and 6 inches apart at the springing, and there is no reason why a spacing of 1½ or 2 feet would not be sufficient. Their main purpose is to prevent longitudinal cracks, and these cracks, if they occurred, need not affect the stability of the arch. They would, however, offend the eye and might cause apprehension in the minds of people unable to recognize them as possibly unimportant, and for these reasons they should be avoided. This great excess of material might have been advantageously employed where reinforcement is more urgently needed and has not been called for, that is, along the extrados.

The writer has been informed that in construction twisted rods were used longitudinally and corrugated bars transversely, and the following criticism therefore applies only to the design as shown and not to the arch as constructed. The drawings call for round rods placed longitudinally along the intrados and twisted rods placed transversely. The longitudinal rods are main rods and the transverse rods are secondary. We thus have an evidently inconsistent use of the materials, since the object in making twisted rods is to increase their holding power in the concrete and fit them to act more efficiently in doing the work. They should be placed, then, in the working position.

Over the circular openings left above the piers there is a network of reinforcement, the purpose of which is not altogether apparent. The writer cannot imagine any reason for providing bars spaced at 4 inches across the bridge and 2 feet apart parallel to the center line of the bridge. If the purpose is to provide for strength over the opening, or if it is an attempt to provide continuity over the piers, it is not a good design in either case.

The sections of the piers and abutments and their footings as called for by the drawings seem light and insufficiently reinforced, but no definite conclusion regarding the necessary sections can be arrived at without a thorough analysis of the problem. If they are light, they would make it possible for one arch under a heavy load to set up stresses in the adjacent arch as well as in the piers. The arch theory, as usually applied, has for two of its assumptions an invariable span and a fixed direction at the springing. In the design there is no sudden transformation from arch to pier, but there is a sudden change in the amount of reinforcement, which appears an item to be criticised. The reinforcement is mainly horizontal, while apparently it should be vertical.



North Face East End of Big Arch, Reinforced Concrete Bridge, South Pasadena Showing Crack on the Right

The lesson from the omission of the extrados reinforcement of the arch and the partial failure may well be borne in mind in the design of beams fixed at the ends and also continuous beams where reinforcement must be provided on the loaded side of the beam at the ends and over the supports. The neglect to provide such reinforcement may result as disastrously as in the case under consideration, since the conditions are similar.

This failure does not reflect in the least upon the concrete steel type of construction. A failure to provide against all possible contingencies may lead to serious consequences in any type of construction. The fact that so many concrete steel arches have been built with no signs of failure gives evidence that the trouble might have been avoided in this case.

Finally, the bridge failure mentioned merely emphasizes the importance of making a most careful analysis of all the conditions of a problem and making sufficient and logical provision to satisfy the demands of the case as presented by the analysis. The most satisfactory design will be that which, in addition to merely meeting the requirements, will do so most advantageously and economically.

The writer, of course, has no desire to reflect on the professional ability of anyone connected with the building of the arch, but it is certainly desirable in events of the kind we have considered that the facts should be known and a full and fair discussion invited.

Reinforced Concrete in the Pacific Northwest

By CARL E. ROESCH

IN the face of the discussion going on in San Francisco as to the relative merits of the various kinds of building material, it is interesting to note the progress being made by all the cities of the Pacific Northwest toward the adoption of reinforced concrete.

Seattle has for several years been erecting buildings of this material, one of the most notable being the Carnegie Public Library, the "Clinton" system of electric welded steel being used in the floor construction, the exterior being stone faced.

An interesting example of the absolute concrete building is found in the "Waldorf Apartments," now just reaching the second floor, plans by Architects Howles & Stokes, of New York, Mr. Ryan of Seattle supervising. The General Engineering & Construction Company is erecting the building, using the Kahn system.

Two shifts of men are being employed, the concrete men working at night and the carpenters in the day-time.

Portland, Bellingham and Spokane have recently completed several large buildings of concrete, in fact all the cities in the Northwest have demonstrated very conclusively that concrete, considered from every view point, is the type of construction which gives greatest satisfaction.

Numbers of architects and engineers with whom the writer has talked, have expressed regret that there were not more examples of absolute reinforced concrete buildings in San Francisco, from which deductions could be made as to the effect of earthquake and fire upon such structures.

It is to be hoped that those interested will see the folly of the constant opposition which has been so successfully waged against the admission of this type of construction and will see that concrete engineers are given an equal opportunity with other artisans, so that our new city may be made up of all the representative types of buildings.

* * *

Cement Sidewalk Construction

ONE of the most common and important uses of Portland cement is in the construction of cement sidewalks. Not alone is cement the most generally used material for city and park walls, but it has taken the place of boards in the smaller cities and villages. Owing to the comparative ease of making, durability and enduring smoothness it has practically eliminated stone flagging and brick from the list of walk materials. Even in the sections where stone abounds, and where Portland cement is high in price, owing to excessive freight rates, concrete takes the preference and displaces the stone. There is nothing that so fully and satisfactorily answers every requirement for sidewalks as does Portland cement concrete. As a general reply to numerous inquiries relating to cement walk building we are treating, perhaps somewhat elementarily, the subject in detail.

Essentially there are three parts to a cement sidewalk—the prepared foundation, where one is necessary, the concrete base, and the top coat or wearing surface. Each is a most important factor, the last two having particular dependence, one upon the other.

Whether a prepared foundation is at all necessary depends upon the character of the soil, and the contour of the surface of the earth where the walk is to be laid. If the soil is sandy, and the underlying strata is porous to allow good drainage, no prepared foundation is required, as the walk could be made directly upon the sand in a shallow trench sufficiently deep enough below the grade line. Should the sandy land lack the necessary drainage owing to a clay subsoil, or if the land is clay, there must be a foundation prepared of considerable thickness. The sole purpose of this prepared foundation is to provide drainage that ice and water will not cause the walk to crack and otherwise get out of order. An excavation of at least twelve inches from the grade line on the top of the wearing surface should be made. Into this shallow trench broken stone, gravel cinders, or even well-broken brick and tile should be placed and thoroughly packed down to the thickness of eight inches and leveled to make the course uniform and to conform with the grade. Upon this concrete for the body of the walk is applied.

Various experienced builders use somewhat different mixtures, but one will meet most satisfactory results if the concrete for the body is composed of one part Portland cement, 2½ parts clean sand, 5 parts gravel or broken stone, the broken stone being small enough to pass through a one-inch mesh sieve. The cement and sand should be mixed together dry and most thoroughly. The fine stone should be dampened so every part of surface is wet—when the cement and sand as mixed should be added and all thoroughly stirred with water being applied until a good wet mixture is obtained. Care should be exercised that the mixing is complete—not partial.

The concrete placed upon the foundation should be well rammed into place and as wet that when compacted a film of water shows on top, and tightly against the planks which should be placed at the sides and on line with the top of the walk at the beginning. When properly packed it should be cut into slabs about four feet square, the cuts being made through to the underlying material. In commercial construction a section is made, then a strip passed by and another section laid, which allows the workmen to get at all sides of the work. Parts of blocks should not be made to be added to, but each slab should be made continuously. Retamping should under no circircumstances be allowed. In the walk building specifications as given by the public service departments in our large cities a most conspicuous clause forbids retamping.

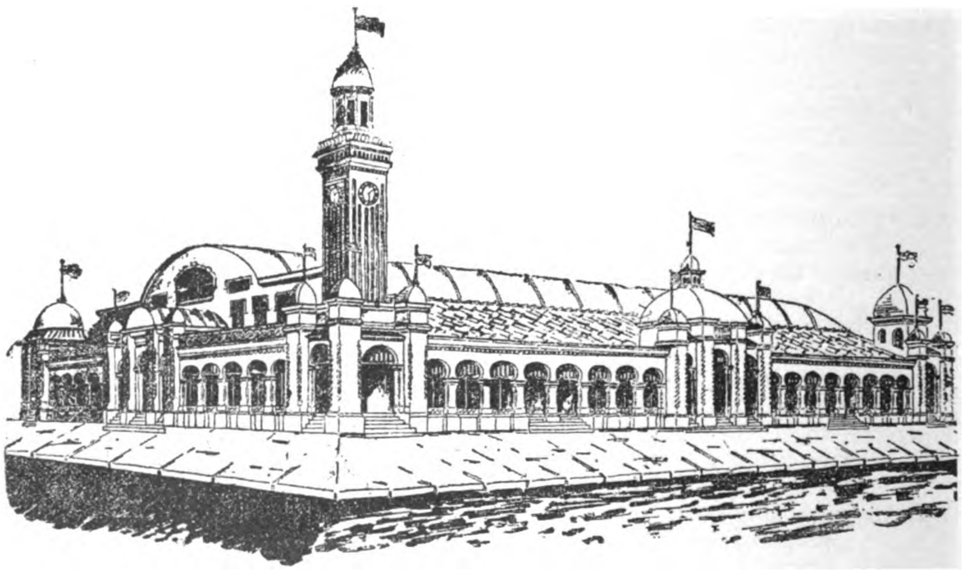
The top surface should be one inch thick. In many sections, particularly small towns and where cement is very high in price, a one-half inch coat is used. In any case this should be composed of equal parts of cement and fine sand or granite chips. This should be of the same kind of cement as the base, and should be placed as soon as possible after the body is completed so that the surface will unite properly with the base. Never try to construct a walk by using natural cement in the base and Portland cement for the top. The two cements do not unite freely, and the result is unsatisfactory. The top coat should be floated and trowelled smooth. Too much trowelling is bad, as it brings the cement to the surface, causing cracking and scaling by making one part too rich, another lacking in richness. The joints and edges should be run smooth by use of a jointing tool.

The surface should then be cut into slabs the size of and to correspond with those of the base, so that settling of the ground or changes by freezing and thawing will not crack the concrete. After it is trowelled smooth level with the top of the grade it is best to crease the surface by means of passing over it some form of light roller made for the purpose. A perfectly smooth surface causes the walk to be slippery in wet and freezing weather. It is popular to sprinkle marble dust upon the surface, which adds greatly to the appearance. Avoid sprinkling dry cement upon the top. An important element in securing the best results is keeping the new walk wet for some time after completion. As soon as the workmen are through it should be well saturated and protected by canvas or other covering from the sun. The water causes more perfect crystallization. After the first day the covering can be removed and the surface covered with sand or sawdust, which should not be removed for fully a week, during which time it should be kept sprinkled with water. The wooden strips at the side should not be removed for some time.

The cost of cement walks naturally varies, owing to cost of materials and accessibility of them to the place of construction. At the present price of Portland cement, and the prices of sand and broken stone and cinders one should not expect the work to be done at less than nine cents per square foot, especially where the earth is calcarious and the work in excavation requires considerable time. This alone often costs a cent per foot. Where the walk can be made upon a sand foundation it could probably be built at a cost price of seven cents.

In San Francisco, before the earthquake, walks of three-inch thickness, 2½-inch base and ½-inch surface, were made upon the light soil at a cost of nine cents, but here Portland cement costs $2.50 per barrel and the beach sand $1.20 per cubic yard.

Lately the tendency has been for contractors to make too low a price, the result of which is the work must be of somewhat inferior quality, or the materials must be skimped or the quality slighted. We are of the opinion that the honest walk builder should receive fully eleven cents per square foot for every foot of walk he builds, and the party having the walk built can well afford to pay twelve to fourteen cents for good work. It is worth every cent of this price.—Concrete.



Sketch for Proposed Coliseum. San Francisco
Philip Schwerdt, Architect

Heating, Lighting and Electrical Work

Fads and Fallacies in Hot Air Heating*

By R. S. THOMPSON

IN ORDER that I may not seem to claim all wisdom in this matter, I ask you to interpolate the words "it is my opinion" before each of my statements. These are my "opinions" based on study, observation and experience. Some of them will probably commend themselves to your judgment. Some may be fads of my own. Some may themselves be fallacies. I believe they are all worthy of our consideration and discussion.

It is a fallacy to suppose that a set of rules can be formulated by the observance of which any man can heat any building. In no two buildings will exactly the same conditions be found. Each building is a proposition to itself. Without an intelligent comprehension of the principles involved, an ability to closely examine conditions, ascertain causes, reason from effect to cause and from cause to remedy, a set of rules may be more of a hindrance than a help. There is no profession in which a "little learning" is more often "a dangerous thing."

Something over a year ago I was called to examine a large church, the heating of which had been a perplexing problem for more than a generation. The auditorium was always cold for at least two or three feet above the floor. I noticed that even when the church had been long heated there seemed to be downward currents of cold air.

There was unanimity of opinion that something must be done to draw the cold air off the floor. One party had suggested putting in an electric fan and pumping it out. At one time the plan had been tried of cutting off the bottoms of the doors into the vestibule and leaving open the door from the vestibule into the tower. The draft of the tower had caused a strong outward flow of cold air under the doors, but the congregation complained so bitterly of cold feet that the plan was abandoned.

After learning all I could about the plans which had failed, I proceeded to diagnose the case. I had all three furnaces fired to the limit for three hours, and then sought carefully for evidences of "back pressure." I found none. Instead I found at the bottom of every door and window a strong inward current of air. That explained the situation. The building was leaking at the top— leaking so badly that all the air the furnaces could supply was being lost by leakage, and more was being drawn in from outside, which, being cold, of course settled on the floor. Had I followed the rule "draw the cold air off the floor" (which is the correct rule when a room is "air-bound" and there is "back pressure" on the furnaces), I would simply have drawn in more cold air to settle on the floor. This explained the

* Read by R. S. Thompson at the convention of the Heating and Ventilating Engineers at Chicago in July.

failure of the plan to use the tower as a pump. This explained the downward currents of cold air.

As the leaks could not be stopped, the only remedy was to pour in hot air faster than it could leak out at the top, and so "push" the cold air off the floor.

I examined the furnaces, and found that when working up to the limit the three could deliver about 1400 cubic feet of air per minute. I took out two of them and put in two others with a combined capacity of 4000 cubic feet per minute, putting in larger pipes to allow this larger flow. With these two going I again examined the building and found air flowing out gently under all the outer doors, but not enough "back pressure" to interfere with the operation of the furnaces. The congregation have not had cold feet since.

It is a fallacy to suppose that you can determine the amount of heat needed for a room or building by ascertaining its cubical contents.

Heat once put into a building would remain there forever, and a building once heated would require no further heat to maintain the temperature were it not for leakage of hot air out and leakage of cold air in and conduction of heat through the walls. But leakage and conduction both depend entirely on wall surface, and not at all on cubic contents, so that wall surface is the only thing to be considered.

I have adopted a rough and ready rule which works well in most cases with the average house, but which, like all other rules, must be used with common sense.

"Divide the number of square feet exposed wall surface by 2. The product is the number of cubic feet of air at 140 degrees that will be required per minute to maintain a temperature of 70 degrees with the outside temperature at zero.

Of course, it is up to the engineer to determine how many cubic feet of air at 140 degrees any given furnace can supply, and how many cubic feet per minute each pipe can deliver. Rough and ready rules will not do in this estimate; an 8-inch pipe will deliver more air under some conditions than a 12-inch pipe will deliver under other conditions.

It is a fad to cover hot-air pipes with a thin sheet of asbestos paper, in order to "keep in the heat." The rough surface of the paper is a better radiator than the bright surface of tin or galvanized iron, and this more than balances the slight gain from the non-conducting power of the sheet of paper. Being spongy, it retains moisture and rots the pipes. The only good purpose I have ever known it to serve is to hide bad joints and botch work. If you must use asbestos, put on half an inch.

It is a fad to set the furnace under the northwest corner of the house with the idea that the air will travel through the pipes more readily in the direction the wind is blowing. Air, while in the pipes, does not know and does not care which way the wind is blowing. Set the furnace where you can reach all the rooms with the shortest pipes and the fewest angles.

It is a fallacy to suppose that you must put a register in the coldest part of the room in order to heat it. It is no warmer six inches away from the current of air that flows from a register than in other other part of a room. The air issuing from a register goes directly to the top of the room, and all heating with hot air is from above downward, no matter where the registers are placed. I should like to try the experiment of heating a house with all the registers in the ceilings. It would at least be a novelty, and I believe would have many advantages.

It is a fallacy to put a register near an outside door or window in order that the wind which blows in through the cracks may drive the hot air over to the back part of the room. If the furnace is working properly there will be an outflow instead of an inflow of air around doors and windows. If the hot air enters near these leaks it will flow out through them and the cold air will be pocketed in the back part of the room. Put your register as far away from the outlet as you can, and the hot air in making its way to the outlet will force the cold air out first.

It is a fallacy for a man to suppose that he can wait till his house is nearly finished before he places his furnace contract and then get good results.

The furnace contract should be let before the excavation for the foundation is begun. As soon as the contract is let the engineer should take the blue prints or tracings of them and lay off on them the entire plan. The location of the furnace, the smoke pipe, the leader pipes from the furnace to first floor register boxes and stack foot-pieces, the stacks, floor-runs, if any, and second floor registers should all be shown. The size of every pipe, stack and register should be given. Then these plans should be gone over with the owner to see that the location of the registers does not interfere with his plans for arrangement of furniture. This settled, copies of these plans should be given to the building contractor, with instructions that as the building progresses openings for pipes are to be left as shown on plans, and the plumbers, electricians and other contractors are not to use these openings nor obstruct the access thereto.

The first clause in the furnace contract should provide that the building contractor is to observe the specifications and plans of the heating engineer the same as he does the specifications and plans of the architect.

It is a fallacy for a man to suppose he can give the building contractor the contract for putting in the wall stacks and registers, and then at any time have a "furnace man" put in a furnace that will heat the house. When I am called on to put a furnace in a house where the pipes were put in by the building contractor I always agree to guarantee those rooms with which I make connections, but tell the party he must go to his building contractor for a guarantee on the rooms for which he put in the pipes.

It is a fallacy to suppose that you can put in a furnace on plans provided by the average architect and afford to guarantee the job. The shoemaker should stick to his last and the architect should stick to his architecture. Not one architect in a hundred has a thorough theoretical knowledge of heating and ventilation, and probably less than one in a thousand has any practical knowledge on the subject. Both theoretical and practical knowledge are needed to secure a successful job. When I am brought a plan on which the architect has laid out the heating work, and asked to follow his plans and specifications, I tell the party that he must go to the architect for a guarantee on the results of the architect's work.

It is a fallacy for a man to suppose that he can have his architect advertise for bids on a heating plant and let the contract to the lowest bidder, and have a properly heated house.

Where this is done the man who gets the contract is the one who has based his estimate on the smallest furnace, the smallest pipes, the cheapest material and the poorest job.

When a test is made he sends an expert fireman, who stands over the furnace with a poker and makes it come near enough to fulfilling the guarantee that the purchaser thinks it better to pay than have a lawsuit.

And from that time on the purchaser has troubles of his own. And he tells all his friends and neighbors that if they ever build they should put in steam or hot water. Hot air is a failure; he knows, for he has a hot-air furnace in his own house.

(To be concluded in the September Architect and Engineer.)

A Modern Heating System

ENGINEERS have been trying for many years to design a system of heating that would have all the advantages of the steam and hot-water systems, with none of their disadvantages or defects—a scheme that would give a wide range of temperature to meet the requirements of the sudden changes in winter and the mild weather of spring and fall. Vapor and vacuum systems in various forms have been put on the market, but—while they have many good points—they do not completely answer the purposes. A variation on them—or rather a new system which embodies all the best features of vapor, vacuum, and hot water, has now been perfected. By the use of the automatic drainage valve, which is placed in the return end of each radiator, and the automatic relief valve, which is connected to the steam and return mains in the cellar, steam can be circulated under a vacuum, at a temperature of 100 degrees F., or at any desired temperature up to 238 degrees, and the heat in any one radiator can be controlled by partially opening the radiator valve.

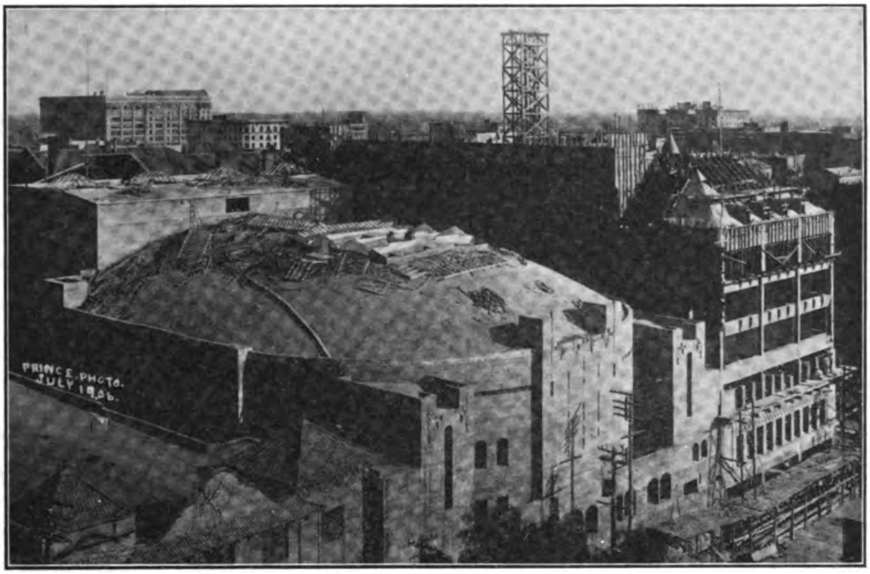
In this system, the hot-water type of radiator is usually employed, with the steam inlet at the top, and the return outlet at the bottom of the radiator. No air valves are used on the radiators, thus doing away with the most annoying and irritating of all contrivances. The system of piping is the ordinary two-pipe dry-return system, with a loop seal at the end of each steam main.

When it is desired to partially heat a radiator, the radiator valve is opened just a little. The radiator will be heated only in proportion to the amount of steam admitted.

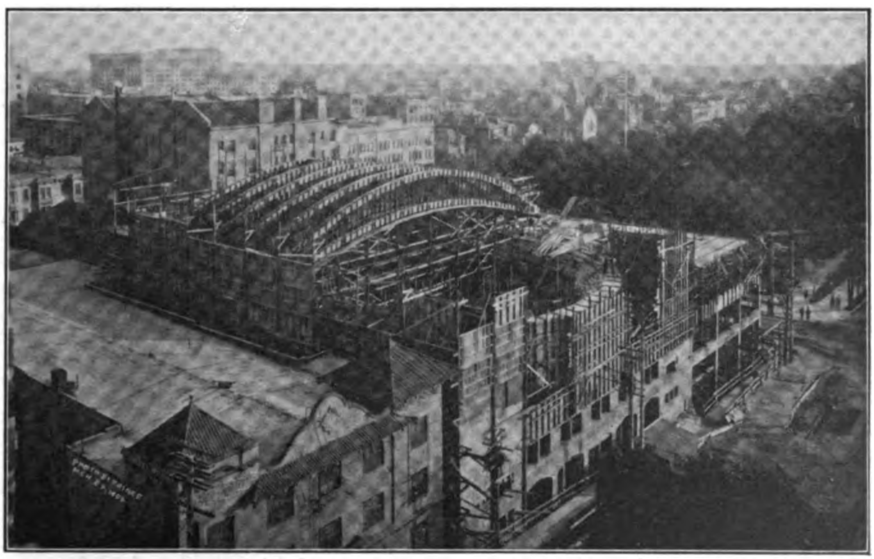
It is claimed that this is the only system of heating where steam can be circulated under such a wide range of temperatures, and the heat be controlled in any radiator. Should a room be too warm, one can partially close the radiator valve, and heat only part of the radiator. Should the room get too cold, the radiator valve can be opened fully. Thus it is possible to control the temperature in each room to suit the occupant, which is surely a great advantage.

The Lichtenstein Building. Market and Davis Streets. San Francisco. Cost $100.000

Chas. J. Rousseau. Architect



Progress Work on Reinforced Concrete Auditorium. Los Angeles. Showing the Completed Roof of Concrete
Chas. F. Whittlesey. Architect



Progress Work on Reinforced Concrete Auditorium. Los Angeles. Showing the 112-foot Roof Trusses
Chas. F. Whittlesey. Architect

Progress Work on Reinforced Concrete Auditorium, Los Angeles, Showing Office Portion of Building
Chas. F. Whittlesey, Architect

Advantages of Electrical Cookery

IN comparing electrical cooking with the other modes, the ordinary coal cook stove and gas range, certain points are noticeable in which this newer method is more sanitary, hygienic and in some sections economical. The electric cooking utensils are self-contained. Their essential feature consists in applying heat directly to the dish containing the food to be heated and in preventing heat from being transmitted to anything else but the food. The principle of the stove differs in that the food is cooked by transmission of heat from a large exposed surface, which has first to be heated, to the dish, a process which wastes much heat. The best coal, gas and oil stoves transmit only about 30 per cent of their heat to the food contained in the cooking utensil, the remainder of the heat, not lost through the chimney, is consumed in raising the temperature of the surrounding atmosphere and in heating the stove itself as well as the air space between it and the utensils. Modern coal stoves show an efficiency of only 2 per cent. Twelve per cent is partially wasted in heating the stove, 70 per cent goes up the chimney, and 16 per cent is radiated. That is, for every 100 pounds of coal bought and burned, 98 is completely wasted from the cooking standpoint. With the gas stove, 20 per cent is available for cooking purposes, while with the electric stove 90 per cent of the heat can be practically utilized.

Not only are electrical cooking utensils efficient, but, aside from the very evident advantages of the absence of smoke, flame and soot, there is no vitiation of the atmosphere. There is no labor, either, in making or maintaining the fire and no danger from fire or explosion. But the old nuisance of letting the kettle run dry is still greater in electrical cooking, for if any cooking device runs dry, it is liable to cause the vessel to leak and possibly to burn out the resistance.—Edith M. Darrow in Good Housekeeping.

* * *

Wetting Lead Pencils

THE act of putting a lead pencil to the tongue to wet it just before writing, which is habitual by many people, is one of the oddities for which it is hard to give any reason, unless it began in the days when pencils were poorer than now, and was continued by example to the next generation. A lead pencil should never be wet. It hardens the lead and ruins the pencil. This fact is known to newspaper men and stenographers. But nearly every one else does wet a pencil before using it. The fact was definitely settled by a newspaper clerk away down East. Being of a mathematical turn of mind, he ascertained by actual count that of fifty persons who came into his office to write an advertisement or a church notice, forty-nine wet a pencil in their mouths before using it. Now, this clerk always uses the best pencils, cherishing a good one with something of the pride a soldier feels in his gun or his sword, and it hurts his feelings to have his pencils spoiled. But politeness and business considerations require him to lend his pencil scores of times a day. And often, after it had been wet till it was hard and brittle and refused to mark, his feelings would overpower him. Finally he got some cheap pencils and sharpened them, and kept them to lend. The first person who took up the stock pencil was a drayman, whose breath smelt of onions and whiskey. He held the point in his mouth and soaked it several minutes, while he was torturing himself in the effort to write an advertisement for a missing bulldog. Then a sweet looking young lady came into the office, with kid gloves that buttoned half the length of her arm. She picked up the same old pencil and pressed it to her dainty lips preparatory to writing an advertisement for a lost bracelet. The clerk would have stayed her hand, even at the risk of a box of the best Dixon pencils, but he was too late. And thus that pencil passed from mouth to mouth for a week. It was sucked by people of all ranks and stations, and all degrees of cleanliness and uncleanliness. But 'twere well to forbear. Surely no one who reads this will ever again wet a lead pencil.—Graphite.

* * *

Women as Builders

THE number of women who practice the profession of architecture is very much greater than the number of women architects, anomalous as this may seem.

Most of the women who make a business of building houses have men in their offices who do the architectural part of the work for them. Usually they begin as decorators, and if they prosper they soon find that orders to build houses also come to them. Usually they have previously added an architect to their office staff, or simple efforts at decoration frequently demand the skill of a trained architect. After a while the architect builds the houses when the orders begin to come in. There are women decorators now prosperous enough to have architects in their employ. One of these now occupies a four-story building in a side street off Fifth avenue merely for her own business. She began in one room down town only a few years ago. Elsie de Wolfe has met with great success since she went in for house decoration and she has found many clients among her wealthy friends. She will probably be the next person in her line of business to undertake the building of houses.

Interior Decoration

Artificial Lighting and the Decorator's Relation to It

By C. WALTER TOZER

EVERY decorator has learned by experience the vital value of light effects, artificial or natural, upon a color scheme or upon the room proportion, or upon what, for want of a better term, we call the atmosphere of an apartment.

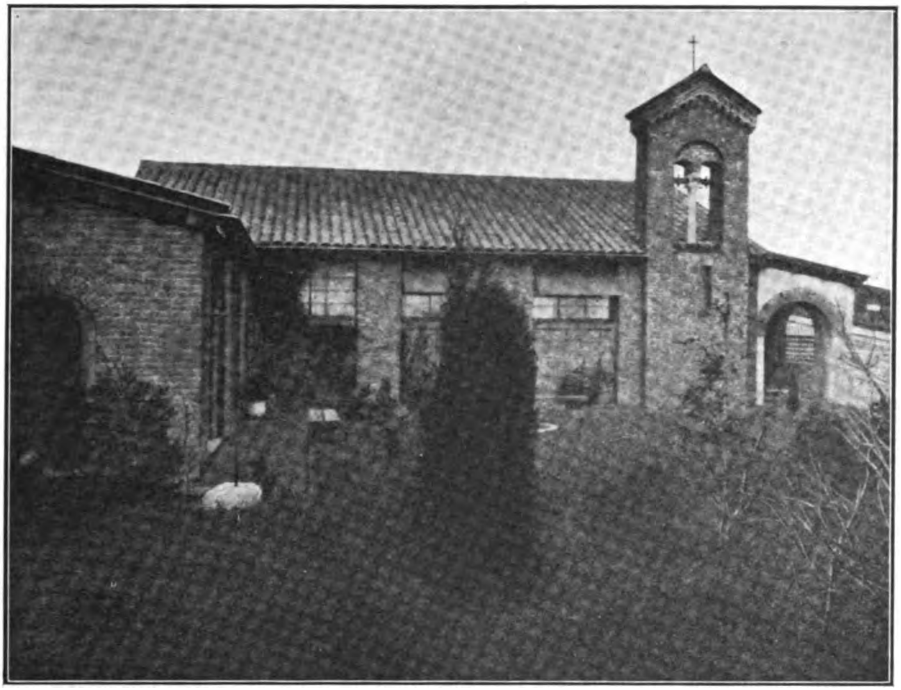
Every room in a house properly designed has been designed for a purpose. Many rooms are never used except when lighted artificially, and the problem, therefore, of light for its decorative as well as utilitarian value is one of great importance. Certain rooms, like the library, present the lighting problem from the utilitarian standpoint, other rooms call for glitter and glare, while still others call for a softly diffused light. This whole question of lighting is a very nice subject for study. Hence it will be seen that the decorator's province becomes broadened, day by day. Time was when the architect was supposed to be authoritative in the making and decorating of the house; but experience has proven upon more than one occasion that the architect's knowledge is architectural, and that in many cases he has not the experience, the training, nor the disposition to consider the furnishings or the interior decorations.

To better bring out the points involved under our heading we will quote some of the observations brought out at the first general meeting of the Illuminating Engineers' Society. L. B. Marks, the president, in his address observed:

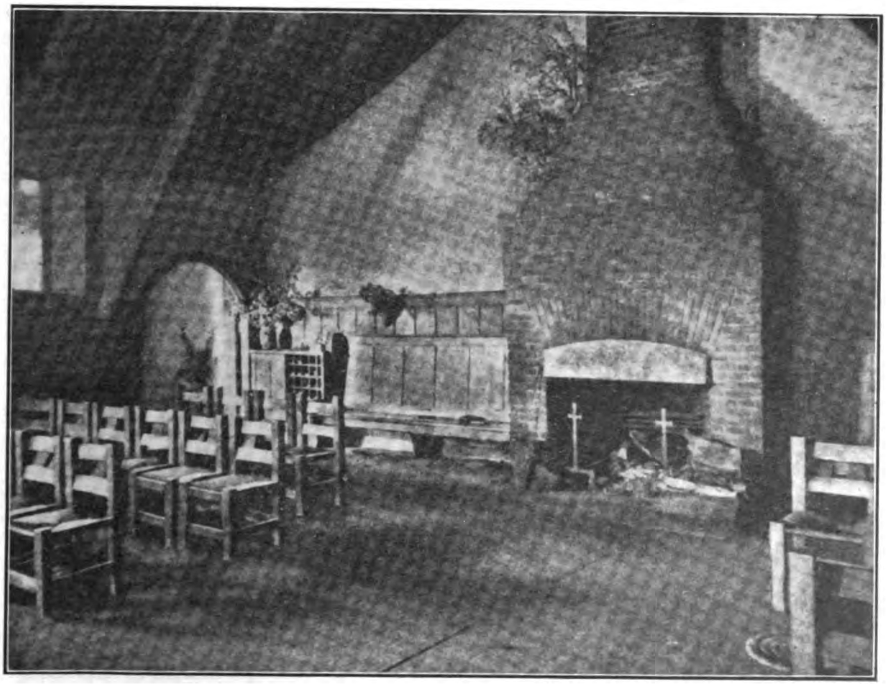
"So far as interior illumination is concerned the lighting layout has been left largely to the architect. It is he who usually prescribes the number and location of outlets for the light sources, specifies the number and candle power of the lamps, and designs or selects the lighting fixtures and accessories. Very often these specifications are completed before the color scheme of the interior has been decided upon, with the result that the degree of illumination obtained may fall short of what is needed in cases of dark-colored interiors, or be excessive in the case of light-tinted rooms.

"The natural tendency of the architect is to make the economical side of illumination subservient to the aesthetic, while on the other hand the tendency of the engineer is to consider only the question of oconomy. It is an encouraging sign of the times that the architect and the engineer are gradually drawing closer together in dealing with problems involving both the scientific and the artistic side of illumination."

Of course the walls in an unfinished building are of themselves light reflectors, and a little light will go a great way. But the minute these walls have been treated by the decorator, and deep, rich, absorbent colors, which take up light so much, are introduced in the walls, carpets, furniture and curtains, we have light considerations far remote from those which confronted the architect and his bare walls. Another engineer observed:



Exterior of New Jerusalem Church, San Francisco
Page Brown, Architect



Interior of New Jerusalem Church, San Francisco
Page Brown, Architect

"The architect works from a certain basis, the decorator from another basis, the purchaser of gas and electric current works from still another basis, and it is the province of the illuminating engineer to harmonize all these and bring them together so that the total of their efforts shall lead to a result which will be satisfactory."

There is a wide field of usefulness for the illuminatig engineer in the field of interior decoration. Millions upon millions of dollars are being spent every year, and the results of labor, skill and direct money expenditures are stultified by bad lighting.

In certain decorative periods we are compelled to utilize the fixtures of the period, but it is no anachronism in art to abandon candles in the colonial room and adopt electricity. The decorative features of the chandeliers, sconces, and candelabra must be retained in certain apartments, for they contribute to the decorative character of the room; but we must advance with science and use the most convenient forms of lighting, and in such a manner that it will serve as a neutral influence upon the color.

* * *

San Francisco the Home of Mission Type of Furniture

THERE has been considerable discussion, from time to time, as to just who originated the "Mission" style and what occasioned its inception. The real facts indicate without any question of a doubt that one of our own architects, Page Brown, designed the first examples of this now popular style. In fact we have these first examples right in our own San Francisco. It was in the little "New Jerusalem" church that the prototypes of all the "Mission" chairs were found. Page Brown was the architect of this church, and to carry out his unique scheme of the interior he designed the "Mission" chairs. From these Mr. Joseph P. McHugh, the New York decorator and furnisher, drew the inspiration that led to his creation of the "Mission" type of furniture.

In an article in the New York Evening Post of recent date a contributor says:

"Consider what an appreciative writer has said of one little church that stood far out toward the Presidio, near Jackson street. It was the little Swedenborgian church founded by Dr. Worcester: 'Within the stranger is impressed with a certain primitive quality about everything. The heavy madrono trunk rafters left in their natural state, the big open fireplace, the massive square-post, rush-bottom chairs, and the large, grave allegorical landscapes of seed time and harvest, painted with loving care by William Keith, combine with the simplicity of design and fitness of every detail to make a church which, without any straining after effect, is unique in beauty.' But this little refuge from the essential ugliness of San Francisco was by no means unique. As the same writer has pointed out, the message of the church's builder has reached its mark. Here and there through the city homes have been reared in the same simple fashion—plain straightforward, genuine homes, covered with unpainted shingles, or built of rough brick, with much natural redwood inside, in broad, unvarnished panels. The same reserve which has characterized the building of these homes has likewise been exercised in their furnishings. A few antique rugs, a few good pictures or photographs of the masters, and many good books, with plain tables and chairs, constitute the furniture. To find this spirit which would have been a delight to William Morris, so strongly rooted as to assume almost the aspect of a cult, is, I take it, one of the most remarkable features of a civilization so new as that of modern San Francisco."

Landscape Architecture

A Comparison of Planting Methods of Southern California and the East

By WILBUR DAVID COOK, JR., Landscape Architect

YOU have asked me to tell in a general way how planting on our private estates in the East differs from that in Southern California. I find little, if any, attempt made at border or massed plantations—very few broad expanses of sweeping lawn to lend dignity, repose and charm to the residence grounds. I know you are up against it on the water question but it isn't always going to be so.

If you will permit me to say so, I think too much attention is paid to the frame and too little to the picture. The eye is distracted by bright splotches of unharmonious colors in the foreground and the lawn areas broken up by too many specimen plants, all fine enough indeed, really, but more in keeping in a botanical garden.

Most of our estates are planted in rather a sombre style, running to symphonies of green in the foreground, with sweeping expanses of lawn framed or edged in with border plantations, with the high lights picked out ever so carefully to emphasize certain important details. Our border plantations are planned to form deep inlets and projecting tops for light and shade effect and by hiding existing boundaries, we add immensely to the apparent area. Our color effects are confined almost entirely to our primal gardens, thus affording a pleasing contrast of unending interest. This lack of repose and dignity I found the most noticeable feature in many of the estates in Pasadena.

I have in mind one estate which gave ample evidence of any amount of money being spent in securing lawn effects, but unfortunately the grounds had been terraced in formal slopes on what was naturally a beautiful side hill slope. Such existing trees as happened to be on the estate had been mounded up until they gave the impression of having been bodily pulled up part way and then abandoned to their fate. The general effect of this terracing is to give one the impression of a relief map. I have not noticed any systematic effort being made to screen out the harsh, hard lines of the house foundations where they meet the lawn.

Briefly summed up, I should say the principal points of difference are these: Where you strive for color effects we do not. Where you make an exhibition of individual specimens, we do not. Where we make a feature of the lawn, generally speaking, you do not. While we strive for effects as an entirety you strive for them individually, with a subsequent loss of dignity and repose. Where we make a feature of border plantations, you do not. Taken as a whole, I think our results are more pleasing. I must, however, in all fairness, say that your possibilities are practically unlimited. You can run the gamut of colors and you can grow many things that we cannot. You can secure effects which we cannot hope to equal.

Among the Architects

Oakland Builders' Exchange

The former rooms of the Builders' Exchange of Oakland are now conducted by the Master Builders' Exchange, of which D. S. Brehaut is president, Geo. C. Noll secretary and H. F. Staring acting secretary. The new officers are all well known and popular. The following announcement has been made in the form of circular letters addressed to all members:

"Your attention is called to the change in name and management of the Exchange at 425 Fifteenth street, Oakland, Cal., and you are cordially invited to continue your patronage as a box-renter or advertiser.

"Improvements in the service will be made as rapidly as possible, and if you have any suggestions to offer which may help those in charge to bring about desired results, please signify the nature thereof.

"Mr. H. F. Staring, in charge of the affairs of the Exchange for the Master Builders, is authorized to receive and receipt for moneys due the Master Builders' Exchange."

Labor Troubles

It seems a pity that San Francisco must face so many labor troubles at this critical season. The city can ill afford to have strikes on its hands to retard the very urgent building operations. Practically every branch of the building trade is receiving the benefit of unprecedented activity, and it is safe to say there is not a mechanic or laborer who is not receiving something over the union scale. Yet despite this liberality on the part of the capitalist serious interruptions of work have occurred. On August 20th about eighty-five hoisting engineers went on strike, and as a result work was suspended on as many buildings in this city, depriving several hundred mechanics in the building trades of work. The engineers demanded an increase of the minimum wage rate from $5 to $6 a day, which the employers declined to grant.

Bids for Concrete Bridge

Bids have been received by the Oakland Supervisors for the construction of a steel and concrete bridge on the county road leading from Oakland to San Leandro, from the end of the present bridge at the east line of Orchard avenue easterly to the lands of Richard Dowling in Brooklyn road district, Brooklyn township. The estimate of County Surveyor Prather as to the cost of the work was $16,499. The proposals offered were as follows: Healy-Tibbitts Construction Company, $21,000; Cotton Bros. & Co., $16,215; Burrell Construction Co., $16,240; E. B. & A. L. Stone, $16,254; New Era Construction Company, $17,833; Dunlevy & Lynch, $17,290.

The bids were referred to the county expert.

Personal Mention

Mr. Wilbur David Cook, landscape architect, is laying out a tract of land containing about 3000 acres between Sherman and Sawtell. Part of the tract includes the foothills known as the Beverley Hills, which present many difficult and interesting problems to combine both beauty and utility. A decided departure is to be made from the usual conventional lines. The plans and work, now in progress, indicate that an exceptionally harmonious and pleasing effect on broad lines will be accomplished.

To Use Roman Stone

Bids are shortly to be taken for the erection of the Luning Building, Geo. Fife owner, at the gore of Market and Drumm streets. E. J. Vogel is the architect and Couchot & O'Shaughnessy are the concrete engineers. It has been decided to make the first story and window frames of Roman stone, the remaining ten stories being reinforced concrete. The frame work will be of steel. The structure is to cost $400,000.

Hot Water, Steam Heat

A circulating hot water plant to supply 96 offices with hot water will be a feature of a seven-story reinforced concrete building to be erected at Montgomery and Sacramento streets by R. V. Kazian and William Mooser. A steam heating plant will be included. Two passenger elevators will be installed. The building will cost $125,000.

New Y. M. C. A. Building

Five hundred thousand dollars have been subscribed for the new Y. M. C. A. building. Secretary McCoy said that the building to be erected will be one of the finest in the world. The building committee has not yet been selected, but work will be begun just as soon as conditions warrant. It has not been decided whether the new building will stand on the old site or not, but it is certain that it will be as comfortable and serviceable as $500,000 expenditure can make it.

Contract Goes to Mahoney Bros.

Mahoney Bros. have taken the contract for the erection of the Magee office building, recently surrendered by the Fuller Construction Company. The plans are by Bliss & Faville, and call for a 12-story building of pressed brick and terra cotta.

Mahoney Bros. have established temporary quarters in the St. Francis hotel.

Pacific Mutual to Build

The Pacific Mutual Life Insurance Company is ready to receive bids for wrecking its seven story building at the corner of Sansome and California streets. As soon as the debris has been cleared a modern eight or ten story office building will be erected.

Hotel at Berkeley

Bids are now being taken by Architect C. M. Cook, of 1003½ Broadway, Oakland, for a five story hotel to be built by J. A. Marshall. There will be 200 rooms. A roof garden will be a feature of the building. An up-to-date hot water heating system will be installed.

Oakland Cottages

Architect Newsom of Oakland has plans for seven cottages to be built at Fiftieth and Dover streets, Oakland, for William Keifer. The cottages will cost $1800 each.

BUILDING REPORTS

Six-story pressed brick building, southwest corner of Mission and Second streets.
Owners—J. S. Morgan & Son.
Architect—E. J. Vogel.
Cost—$100,000.
This building will be of handsome pressed brick with a stone entrance and vestibule. It will be a Class B structure and will contain two fast running elevators. The cornice will be of terra cotta. The building will be used for stores and lofts.

Bank Building, Montgomery and Clay streets, San Francisco.
Owner—Bank of Italy (now in the Montgomery Block).
Cost—From $100,000 to $200,000.
Competitive plans have been submitted to the bank officials for a building to be seven or eight stories high, either of brick and terra cotta or reinforced concrete, and containing banking quarters on the ground floor and offices above.

College building, Fourteenth street, near Jessie, San Francisco.
Owner—College of Physicians and Surgeons.
Architect—E. F. Young.
Cost—$50,000.
Work on this structure will be started at once. It will be of concrete and three stories high.

Four-story reinforced concrete building, Pine and Front streets, San Francisco.
Owner—Charles A. Son.
Architect—Clinton Day.
Cost—$50,000.
This building will be one of the handsomest in design that has yet been planned of reinforced concrete. There will be a bank on the ground floor and offices above. The size of the lot is 92x60 feet. The building will have attiactive ornamentation.

Temporary structure for Paulist Fathers, on site of old residence, California street, near Dupont, San Francisco.
Owner—Paulist Fathers.
Architects—Welsh, Cary & Welsh.
Cost—$5,000.
A frame structure with a seating capacity of 600 is now in course of erection.

School building, Fell and Fillmore streets, San Francisco.
Owner—Christian Brothers.
Architects—Welsh, Cary & Welsh.
Cost—$14,000.
This frame building will be directly in the rear of the Sacred Heart Church, and will be built on a concrete foundation and classic design to harmonize with the church. There will be twelve classrooms.

Eight-story office building, San Francisco.
Owner—Mr. Lunning.
Architect—Nathaniel Blaisdell, 3243 Washington street.
Cost—$125,000.
This building will be a Class A, steel frame, pressed brick and terra cotta office building. There will be a high speed elevator, tile and marble entrance, etc. Bids are now being taken.

Two-story building, East street, between Mission and Howard streets, San Francisco.

Owners—Barneson & Hibberd.

Architects—O'Brien & Werner.

Cost—$60,000.

This building, which has been previously referred to, will cover 30,000 square feet, and will contain 100 offices and 24 stores. The structure will be known as the "Maritime Building."

Four-story brick building, Eighth and Howard streets, San Francisco.

Owner—Henry F. Bothin.

Architect—Frank Van Trees.

Cost—$60,000.

This building will be of brick with plastered exterior and hard wood interior finish. There will be five stores and 60 rooms. The entrance will have tile floors. The bay windows and cornice will be of metal and galvanized iron.

Two-story Class B building, Market near Kearny street, San Francisco.

Owners—Speck & Co., real estate agents.

Architects—Meyer & O'Brien.

Cost—$15,000.

The building will be after the mission style of architecture, two stories with plate glass and green marble. The first floor will have a 20-foot ceiling with a balcony. There will be offices on the second floor. Bronze ornaments will make the exterior attractive.

Apartment houses—Jackson street, near Leavenworth.

Owners—Drs. Clyde and Redmond Payne.

Architect—W. G. Hind.

Cost—$82,000.

There will be three buildings of frame construction and modern improvements, including steam heat and elevators There will be a total of 64 apartments of three, four, five and seven rooms each.

Fireproof office building, Pine and Leidesdorff streets, San Francisco.

Owner—Edward W. Hopkins.

Architect—S. H. Woodruff.

Contractors — Woodruff Construction Company.

Cost—$125,000.

This structure will be seven stories high, and a remarkable feature of its construction will be the absence of wood in its construction. The exterior will be of reinforced concrete, the window glass molded over steel wire net and the window sashes and door frames of bronze. The floors will be of marble, interior finishings of steel "mahogany," and there will be a heating and ventilating system installed so that the air may be changed every second.

Five-story brick apartment house, southeast corner of Post and Polk streets, San Francisco.

Owner—O. D. Baldwin.

Architects—Ross and Burgin, Bush and Laguna streets, San Francisco.

Cost—$80,000.

The foundations for this building are now being built. The general contract has not been let. The building will be five stories and will contain an up-to-date steam heating plant, tile bath rooms, marble and mosaic entrance and vestibule, dumb waiters, etc.

Five-story office building, north side of Eddy street, adjoining the old Poodle Dog restaurant.

Owner—Joseph estate.

Architects—Ross and Burgin.

Cost—$45,000.

This building will be Class B, of buff pressed brick and terra cotta; steam heat, elevator, metal window and door frames, etc.

Church, Duboce ave., near Noe street, San Francisco.

Owner—First Christian Church.

Architects—Ross and Burgin.

Cost—$35,000.

This edifice, for which plans are now being made will be of brick with plastered exterior, and will have a tile roof and a seating capacity of about 600. There will be stained glass windows.

Three-story flats, south side of McAllister street, near Laguna street, San Francisco.

Owner—Mrs. John Hayes.

Architects—Welsh, Cary & Welsh, 40 Haight street.

Cost—$10,000.

The building will be frame and in every way up to date.

Two-story building, Post and Market streets, San Francisco.

Owner—Lyon & Hoag, real estate agents.

Architect—J. F. Dunn.

Cost—$30,000.

The building will contain twenty-four offices and five stores. The facade on the Post street side will be in the French renaissance, and will be treated as a colonnade, which will permit of the use of much glass and metal between the columns. The exterior will be of brick.

Two-story store and office building, Van Ness Avenue, near Grove street.

Owners—Walsh & Prichard.

Architects—Rousseau & Son.

Cost—$40,000.

The building will be of brick and terra cotta; equipped with plate glass front and prismatic windows. There will be eleven stores and seventy-two offices. A vacuum cleaning equipment will be installed in each room, and the entire building will be modern in every respect.

Factory building, Valencia and Brosnan streets, San Francisco.

Owners—Levi Strauss & Co.
Architect—Albert Pissis.
Cost—$100,000.

The building will be three stories high and will contain over 100,000 square feet and give employment to 1500. A private electric light, heating and motive power plant will be installed.

Robinson & Gillespie have been given the contract, which calls for the completion of the building in ninety days.

Three-story hotel and store building, Post street, near Fillmore, San Francisco.

Owners—W. Baron and Alex. Mann.
Architect—W. W. Gates, 994 Haight st.
Cost—$32,000.

This building will be of concrete, the ground floor, covering 4000 square feet, will have a restaurant, and there will also be several modern stores, with sixty rooms overhead for hotel purposes.

Residence, Van Ness avenue and Clay street, San Francisco.

Owner—Claus Spreckels.
Architects—Reid Bros.
Cost—$800,000.

The magnificent Spreckels mansion which was wrecked by the fire is to be restored in all its grandeur, and the architects are now busy with the plans. The structure is to be of stone and marble.

Stores and offices, East street, between Mission and Howard, San Francisco.

Owner—Maritime Realty Co., J. Barneson, president.
Architects—O'Brien & Werner.
Cost—$110,000.

This building will cover a lot 230x137 feet and will be of brick and steel, and two stories. There will be 24 stores and 100 modern offices. It is estimated that the building can be completed in four months.

Bank building, Mission and Sixteenth streets, San Francisco.

Owner—Anglo Improvement Company.
Architect—Sylvain Schnaittacher.
Cost—$55,000.

The building wlll be four stories and will be occupied by the Anglo-Californian Bank, the ground floor being especially fitted up for that institution. There will be 42 offices above.

Warehouse, southwest corner of Front and Jackson streets, San Francisco.

Owner—O'Sullivan Estate.
Architect—Houghton Sawyer.
Cost—$30,000.

Work has already started on this building, which will cover a lot 92x137 feet and will be one story, having a clear height of 24 feet with a gallery for storage goods and a freight elevator. The private offices of the firm will be very handsomely finished in paneled work.

Apartment house, northeast corner of Hyde and Lynch streets, San Francisco.

Owner—F. J. Young.
Architect—C. H. Barrett.
Cost—$75,000.

There will be 26 apartments of two, three and four room suites, finished in natural woods and provided with gas ranges, patent beds, etc. An automatic elevator will be a feature of the building.

Hotel, Sutter and Hyde streets, San Francisco.

Owner—Dr. Julius Rosenstirn.
Cost—$200,000.

The new building will be seven stories, Class A, of reinforced concrete, and the grill room will be one of the most elaborately decorated in the city. There will be 200 rooms. Dr. Rosenstirn's agents are Harrington, Weidenmuller and Rosenstirn.

Three story building, Powell and O'Farrell streets, San Francisco.

Owner—Mrs. Minifie.
Architects—Salfield and Kohlberg.
Cost—$25,000.

Work has started on this building, which will be of brick and stone and Spanish design. The structure will contain stores and offices.

Two story warehouse, northeast corner of Brannan street and Boardman place, San Francisco.

Owner—Henry E. Bothin.
Architect—Frank Van Trees.
Cost—$30,000.

This building will follow the Mission style of architecture. Concrete with tile roof will be used.

Apartments, Bush street near Powell, San Francisco.

Owner—Mrs. L. M. Bigelow.
Architect—J. Cather Newsome.
Cost—$80,000.

This building will be eight stories high, built either of brick or concrete, and will contain apartments in every way up to date.

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OWNER TO BLAME FOR POOR BUILDINGS

One of the most prominent architects in San Francisco said the other day that the city is going back to just where it was before the fire, architecturally speaking. It hurts to make public this declaration, but if another calamity is to be avoided, now is the time to guard against it. By his statement, "going back where it was before the fire," the architect had in mind the position of the owner who wants a fire-proof building, but isn't willing to pay for fire-proof material. Right after the fire no less than half a dozen property owners whose buildings were destroyed talked to this architect about rebuilding. Each one expressed himself very emphatically in favor of sparing no expense in erecting structures that would not only stand a possible repetition of mother earth's disturbances, but would resist the fire demon as well.

"We can build you a fire-proof building if you are willing to pay for one," was the cheering information of the architect, but ere the ashes of the April conflagration had cooled the owner had changed his mind and his reply to the architect in this case, as in scores of others, has been:

"Too much money. Better cut down the expense and make the building as near fireproof as you can without too much outlay."

The architect surely did his part in trying to encourage good construction. If what he designs and builds fails, the owner, under the circumstances, is the one to blame. He is the real culprit.

* * *

NATURAL STONE WON'T STAND HEAT

What a failure granite, stone and marble have been from a fire-resistive standpoint Stone, especially, has proved its utter worthlessness, and it is safe to say architects will, in future, refrain from using it in places where fire can reach it. The stone crumbles and breaks off as soon as it becomes heated, leaving the building with which it is faced or trimmed a sorry spectacle. Only a few days ago a portion of a Colusa stone pilaster on a new San Jose building crumbled and cracked most distressingly through being heated by a fire in an adjoining stable.

* * *

DON'T STANDARDIZE CONCRETE

With the advent of reinforced concrete construction in San Francisco, has come the suggestion by many architects that the design of the material be standardized, as in the case of steel. Such a condition would, of course, be extremely valuable and a great timesaver, but the difficulties attendant upon such a procedure present themselves in great number to anyone familiar with the principles of reinforced concrete design. Much of the danger arises from the shearing condition and it is absolutely essential that he who would safely design reinforced concrete structures have a good knowledge of mechanics.

It is not enough to know that a beam of given dimensions with a given area of steel in the flange will carry a given uniform load or a given load concentrated at the center. The reinforcement is worthless unless it is properly placed and takes care of the shearing condition.

Take, for example, the case of a beam with a given span, simply supported at the ends and carrying at the center a heavy concentrated load. In steel, we double the load, consider it uniform, and obtain the necessary beam from a hand-book. Assuming that we had a similar hand-book on reinforced concrete, we would come to grief were we to use it in like manner without further provision for safety.

The foregoing is but one of numberless conditions of the same character, all of which go to prove that reinforced concrete design requires a knowledge of the fundamental principles of the mechanics of materials.

Material for Rebuilding

Surveyor of the Port Woodward calls attention to the large fleet of ships bound to this port with heavy cargoes of building material and those that are preparing to sail for here. The list is as follows:

From Antwerp, four steamers and thirteen sailing vessels have sailed, and one steamer and eight sailing vessels are on the berth; Bremen, one vessel has sailed; Calcutta, one steamer has sailed; Genoa, two vessels have sailed; Hamburg, eight steamers and eight vessels sailed, and three vessels are on the berth; Hull, two vessels have sailed; Liverpool, two vessels and one on the berth; London, three steamers sailed, five sailing vessels cleared and two on the berth; Newcastle, four vessels sailed, one on berth; Rotterdam, five vessels sailed, one on berth. This makes a total of sixty vessels and seventeen steamers. There are thirty-two vessels on the way from other ports, not including Oriental ports, whence there will be a heavy traffic.

These 109 vessels have on board 213,000 tons of cargo, mostly structural steel for the rebuilding of San Francisco, including 300,000 barrels of cement, the duty on which will be nearly $100,000. There have already arrived here 65,409 barrels of cement, the duty on which is $23,832.88.

* * *

Developing the West

The rush of settlers westward has increased the traffic on all western lines, especially those to the Far West and Pacific Coast. This means additional equipment to handle freight and passengers.

For the year 1906, the Southern Pacific Company has ordered 60 chair cars, 10 baggage cars and six diners—three of these diners being for the Southern Pacific Company and three for the Central Pacific.

There has also been ordered for the freight department 1250 box cars, of which 750 are for the use of Southern Pacific and 500 for Central Pacific; 100 flat cars, of which 60 are for the Southern Pacific and 40 for the Central Pacific; for handling meats and fruits they have ordered 300 refrigerator cars, 150 for the Southern Pacific and 100 for the Central Pacific.

In addition to the above orders, there have been ordered 11 of the Atlantic type locomotives, and six of the Pacific type; also 32 consolidation locomotives and 23 switch locomotives. Of the above locomotives, the Southern Pacific will use nine of the Atlantic, six of the Pacific, 16 of the consolidation. and 16 switchers, the balance to be used by the Central Pacific.—Sunset Magazine for August.

The Publisher's Corner

Western Iron Works Plant. One of the First to Resume Business After the Fire

Enterprising—The Western Iron Works

Few San Francisco industries have displayed greater enterprise since the big fire than the Western Iron Works, one of the pioneer steel industries on the Pacific Coast. When the conflagration swept away this company's plant its shops were running day and night in an endeavor to keep up with orders. Plans for enlarging its plant had for some time been under consideration. The fire came and, of course, took everything in its path. The president and manager, W. B. Morris, realized that if the old shop was not large enough to handle the business of the company before the fire, nothing short of a building twice the size of the one burned would suffice after the disaster, for if there is any one kind of building material now in demand more than another it is steel and iron. So the new home of the Western Iron Works was not only doubled in size, but tripled, and even with the added room thus provided the problem of taking care of the tremendous increase of business is one not easily solved.

The Western Iron Works first began business in San Francisco back in 1852, at which time the late John R. Simms was its ruling spirit. In 1889 the company was incorporated, with W. B. Morris as president and manager; H. M. Wright, vice-president, and L. T. Gates secretary. Its shops for years have been on Beale street. Immediately after the fire a lot 20x60, on the west side of Main street, south from Mission, and extending through to Beale street, was purchased, which gave the company altogether three lots, each 45x137 feet, upon which was erected a mammoth corrugated iron building, triple the size of the old structure. New machinery was installed, and to-day the Western Iron Works can honestly boast of having one of the largest and best equipped structural iron and steel shops in San Francisco. It was the Western Iron Works, by the way, that was first to establish an office in the burned district after the fire. On April 28, just ten days after the disaster, the company was comfortably housed in its then palatial office—a building that will pass into history as a typical illustration of California loyalty and business enterprise. Among the large orders which the com-

Interior of Western Iron Works Mammoth Machine Shop

pany is now filling is one for the Schilling Company, consisting of all the structural steel and iron work for this concern's new factory buildings.

* * *

Low Rates to Bring Labor West

The passenger department of the Santa Fe and Southern Pacific companies announce that, in view of the great demand in California for labor, it has been decided to put into effect low one-way rates from all points east.

From Chicago the fare will be $33; from St. Louis, $31; from Omaha and Kansas City, $25; from New Orleans, $31; from points in Indian Territory, Kansas and Nebraska, $25; from New York, $50, and corresponding rates from other points. They will remain in effect until the end of October.

There never was such a demand for labor in the history of California. Thirty thousand men, women and children are needed to gather the immense crops of hops, grapes, prunes and other fruits, and sugar beets. The men in the lumber industry can employ twice the present number in the pine forests of the Sierra Nevadas and the redwood forests of the Coast Range. The railroad companies want 15,000 men for railway construction with at least a year's work.

In the rebuilding of San Francisco thousands of carpenters, bricklayers, plumbers, and in fact all classes of skilled labor are badly needed. And this need will increase as fast as the architects and ground owners can get plans ready for the steel frame buildings that are going up; over one hundred and fifty of which have already been planned.

* * *

Mr. A. Breslauer, one of the best known cement importers of the Coast, reports sales as excellent, his only annoyance being the apparent effort to confound the well known Lion Brand, which is standard in every particular, with some of the inferior grades of cement bearing names sufficiently new to be misleading. Lion Brand of cement is made and sold on honor, meets every requirement and stands every test required of a strictly first-class Portland cement.

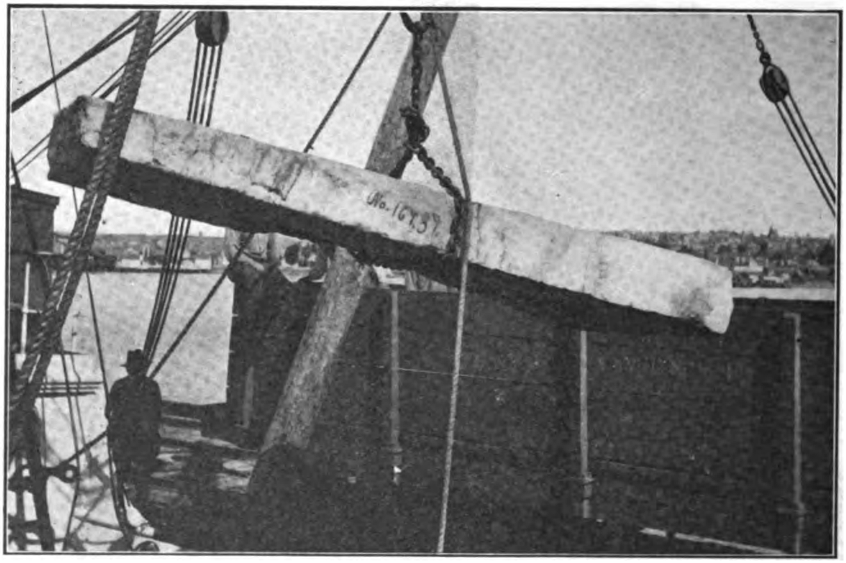
* * *

The New Peninsula Onyx

The New Pedrara Mexican Onyx Company, which has opened a branch office in Room 48, Bacon Block, Oakland, with Mr. Lew C. Black in charge, will make a strong bid for the interior finish and fixtures of the finer buildings in San Francisco and on the coast in general.

The company owns 5000 acres of land in Lower California, about two hundred miles south of San Diego, on which is located the largest deposit of the finest onyx known in the world today. The supply is practically inexhaustible, and they can furnish this beautiful onyx in as large blocks or slabs as it is possible to handle.

Up to the present time the stone has been used almost exclusively in the manufacture of soda fountains. The company is now supplying about 10,000 cubic feet a year to eastern manufacturers of this class of goods, and the fact that Peninsula Onyx is used in practically every onyx soda fountain produced in the United States today is a very great testimonial for its beauty and quality. The company has shipped sixteen carloads so far this year. The sales are continually increasing, and notwithstanding the fact that the company is working thirty men at the quarries it is having difficulty getting out the stone



Lifting a Piece of Onyx

fast enough, and plans are under way to put in additional up-to-date machinery besides increasing their working force.

One of the beauties of the Peninsula Onyx is the fact that although the stone can be selected to match in coloring, every slab is a study in itself, as no two are marked exactly alike. The marking and coloring of this stone is one of the many works of nature that cannot be imitated or equaled in beauty by the hand of man.

The first cut shown herewith will give the reader an idea as to the thickness of the ledges and the way it is found at the quarries, while the second illustration shows the onyx being transferred from the ship to the cars at San Diego. This particular block was 14 inches thick, 4 feet wide and 16 feet long, contained about 75 cubic feet and weighed 13,500 pounds, or 6¾ tons.

Onyx Quarry

Interlocking Stone Company

The Interlocking Stone Company was recently incorporated under the laws of California, for the purpose of manufacturing patented, reinforced interlocking blocks for buildings of all descriptions. In a circular recently issued the company states:

"It is gratifying to note the rapid development of the concrete building blocks in the United States. The cement block displaces about thirty bricks and a much greater number of cubic feet per hour or day can be laid with hollow blocks than with brick. The block, being hollow, saves material, at the same time producing a more desirable form of construction, making the building warmer in winter and cooler in summer.

"The fire-proofing properties of concrete is another claim which is appreciated by owners of buildings, as insurance rates are thereby reduced.

"Our reinforced interlocking blocks are the only actual interlocking blocks in the market, both economical and durable, combined with an attractive finish for the outside, while the inside is plain and smooth, and can be moulded to any design. Each wall is composed of an outer and inner parallel face. Our blocks are reinforced with steel as they are moulded and again reinforced and interlocked when the blocks are set in place.

"Each interlocking stone is moulded with dove-tail shaped keys at the rate of one-eighth to each inch, which rest upon one another, thus utilizing its own weight to fortify construction.

"Mr. G. A. Peterson, the manager of the Interlocking Stone Company, personally superintended the erection of the Wempe building, corner Fifth and Adeline streets, Oakland, Cal., which is made of concrete blocks, on made ground, formerly a swamp. No other known building stood the test of the earthquake better than this one. The proprietors of the Schmidt Lithograph Company examined the building three days after the late quake, and were so pleased with its solidity and perfect condition that they immediately purchased the property.

"The company has set aside a limited number of shares of the capital stock, to be sold for the purpose of enlarging the business and erecting a plant, in order to manufacture our interlocking stone on a more profitable basis, as the orders for building blocks are coming in fast."

The officers and directors are: J. G. Niggle, president; F. V. Schiller, vice-president; G. A. Peterson, manager; D. O. Wallace, director; A. Weimann, secretary and treasurer.

The company's offices are at 563 Ninth street, Oakland.

Fire-Proof Brick

The following from the Monterey Daily Cypress of July 14 will interest brick men in particular and the building trade in general:

"That the Monterey sand-lime brick is fire-proof is illustrated by one now on exhibition at the First National bank in this city.

"This particular brick was subjected to an intense heat in a furnace at the brick works at Seaside for two days. So hot was the heat that a piece of cast iron was melted, and the iron ran down and fused with the brick. The brick shows no sign of the fire except being roughened a little and glazed.

"The iron and brick are cemented together by the intense heat so strongly that they can not be separated.

"Fire brick in the furnace, where the sand-lime brick was, were twisted and warped under the heat. The sand-lime product is used in the place of fire brick in some of the furnaces.

"The brick on exhibition proves there would be no danger of a sand-lime brick and steel structure crumbling under the hottest fire, for the heat would merely braze the brick and steel together. It proves that besides being the best building material it is also absolutely fire-proof."

W. F. Barnes, president of the W. F. Barnes Commercial Company of San

Francisco and one of the leading promoters on the coast of the Schwartz system for the manufacture of sand-lime brick, adds to the above the following information:

"This test was not an intentional one as the lime kiln was faced with fire brick and the background was made of sand-lime brick, but the iron bars put in to support the lime rock would not stand the intense heat and fell in, and in doing so tore down the wall, thereby mixing up the sand-lime brick and fire brick, and it seems that the sand-lime brick coming in contact with the iron produced a result as described in the paper. It certainly is good evidence that sand-lime brick is quite as good as a good deal of the fire brick that is put upon the market.

"These sand-lime brick were made by the Schwarz System Brick Company's process, which is owned by the Monterey Brick & Stone Company of Seaside, California, and anyone desiring to correspond with them in reference to this matter can do so."

* * *

Make Blue Prints

During the last month, the Occidental Blue Print Company, a corporation, began business at 509 Golden Gate avenue. San Francisco, with facilities for rapid work at low rates. The company is preparing to operate an approved type of the Federal Continuous Blue Printing Machine, and will guarantee acceptable work. Phone, Special 1556.

* * *

Santa Rosa Rebuilding

Santa Rosa is making rapid strides in recovering from damage done to the city's buildings by the earthquake and fire. Nearly $1,000,000 worth of new work is under contract in that city and much of it is Class A work. Among the firms that are getting their share of the new business are Hoyt Bros., general contractors. The firm is building a beautiful stone and shingle church in Cloverdale for the Congregational Society, which will be one of the finest edifices in northern California.

* * *

Eight Pertinent Facts About the Grinnell Automatic Fire Sprinkler

1. Over 100,000 buildings in every part of the world are protected by the "Grinnells."
2. Over five thousand fires have been successfully extinguished by the Grinnell Sprinklers, with an average loss of less than $250, while same class of property not sprinkled the average loss has been $8000.
3. The Grinnell Sprinkler is opened

automatically by the heat of the fire, and confines damage, whether by fire or water, to a limited area and minimum amount.

4. The Grinnell Sprinkler has rendered it possible (depending upon the character of the property) to reduce the cost of insurance 25 per cent to 60 per cent, and with a large pecuniary gain to insurance companies.

5. The saving thus effected in the cost of insurance soon pays for the sprinkler equipment.

6. The Grinnell Sprinkler is recognized by all insurance companies as the most reliable protection against fire losses, and it is the best possible security against interruption to a prosperous business, often more serious than the actual fire loss.

7. All modern appliances for extinguishing fires aim at promptness at the point of danger. A pail of water at the beginning will extinguish any fire, pro-

vided the pail of water is there, and some one to use it.

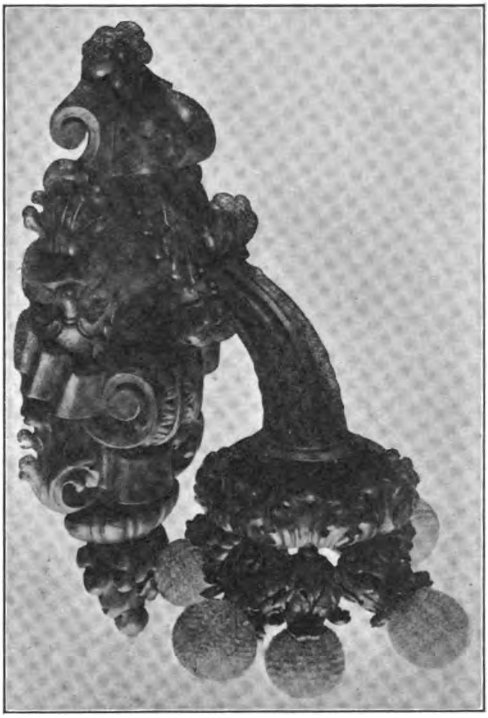
8. The Grinnell Sprinkler is itself the first pail, **but it requires no human agency to operate it.** It is on duty night and day.

The company's San Francisco agent is the Pacific Fire Extinguisher Co., 145 Howard street.

A Good Roof

W. & P. stands for Watson and Prutzman, the two men whose combined efforts have won a reputation for the products of the Pacific Refining and Roofing Company, the roofing department of which has recently been taken over and is now controlled exclusively by Mr. W. J. Watson, with offices at 314 Octavia street.

Mr. Watson is the inventor and discoverer of most of the processes and products of the company. He has been engaged in this same business for almost forty years, having established his first plant in 1867, at Erie, the center of that great manufacturing district of Western Pennsylvania and New York. Mr. Wat-



son afterwards established plants at Louisville, Kentucky, and at Nashville and Memphis, Tennessee.

W. & P. roofing is a felt made of woolen rags and saturated with coal tar—a close-woven substance entirely waterproof. This is laid shingling on the roof boards, with laps of two-thirds if three-ply and three-fourths if four-ply, and as laid the successive laps are cemented together with the distilled pitch of coal tar.

When the felt is so laid it forms one solid sheet over the whole roof surface, independent of roof boards and **without a nail** to **work loose** or **a joint to open or leak.**

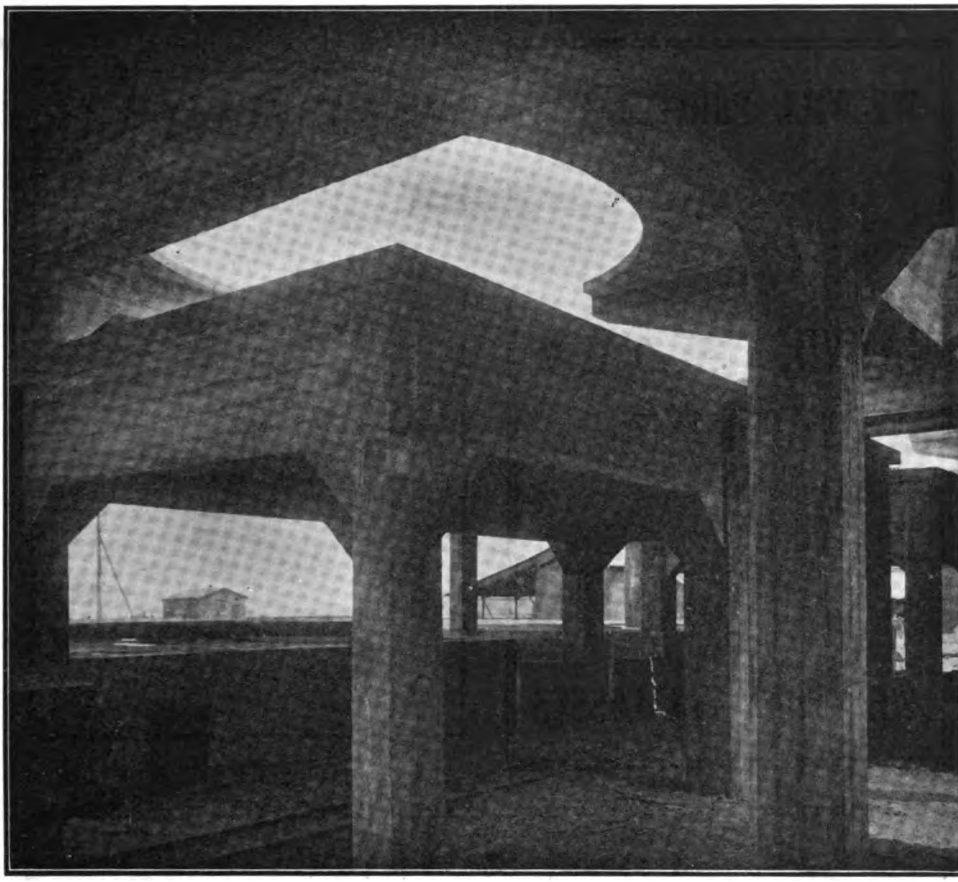
The felt is run up the fire walls and around all skylights and other openings, and is then flashed and counter-flashed with galvanized iron. After this is done the whole roof is flooded with a heavy coat of the pitch, into which, while the same is still hot and liquid, a complete covering of clean washed gravel of small and uniform size is imbedded.

It is a roof **without a seam or joint,** and therefore not subject to leaks; not fastened to roof boards except at sides of building, and thus unaffected by shrinkage of boards and timbers, impervious to dampness, and therefore not subject to rust or decay; unaffected by salt air, fumes or gases. And these are the requisites of a good roof for use anywhere and everywhere.

Architects who design bungalows will find the Angle lamp, carried by the Boesch Lamp Company, of 1135 Mission street, a satisfactory light to specify for their clients. It has many commendable features. Besides giving a light of great brilliancy, it does not throw out soot or discolor and blacken the ceiling; neither does it give a bad odor when turned low. There is a constant circulation of cool, fresh air in the globe and top. This reduces the radiation of heat to a minimum, besides assisting the combustion. The horizontal position of the wicks keeps them thoroughly saturated with oil, so that when first lighted until the last drop of oil is consumed, the light remains absolutely the same.

Mr. O. S. Sarsi has closed the contract to restore the architectural terra cotta in the immense light court of the James Flood Building. The work will be done with ornamental concrete stone. He has also closed the contract for the restoration of the terra cotta ornamentation on the front of the Telephone Building. This will be done in ornamental concrete stone also. The T. V. Galassei Mosaic Company are associated with him in these contracts.

Since the fire the C. A. Westcott Paint Company of 150 East street has had its business practically doubled. Mr. Westcott has given personal attention to the business and the result is the firm has been getting the cream of the water front work. Mr. Westcott has done all the mail dock work since the fire, and has painted both of the big sheds that were saved. All the new boats, including the Yosemite, Quinault and Svea, have been painted by him. There are few, indeed, of the big contractors for whom Mr. Westcott has not done more or less work of late. Most of the railroad, bridge, structural and boat work has been coming to him without the asking. Some idea of the volume of work done by this firm may be had when it is stated that Mr. Westcott has been doing all the painting for Mr. Spreckels, who owns a big fleet of tug boats, as well as the painting for the Healy-Tibbets Construction Company.



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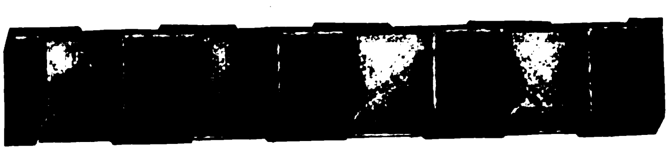

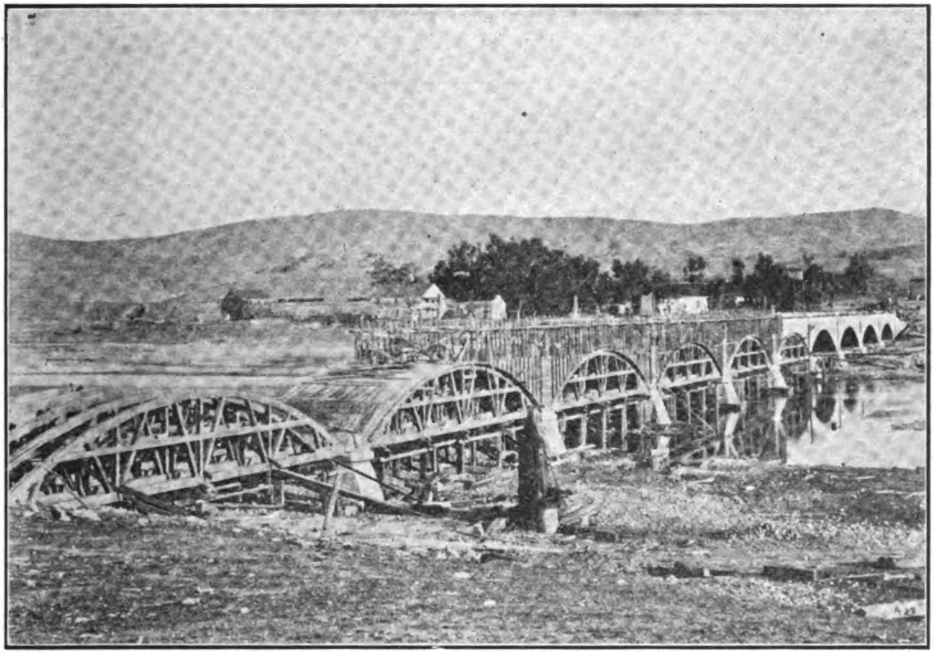

Bridge at Pollasky, Ten 75-ft. Spans. Concrete Work by Worswick Street Paving Company

SEPTEMBER
1906

VOL. VI

NO. 2

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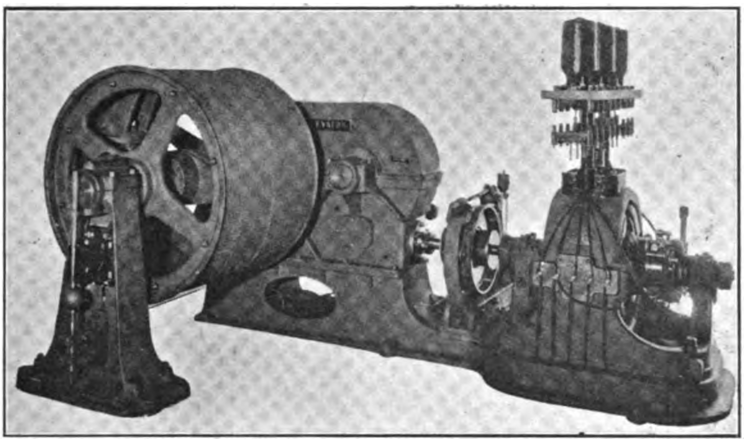

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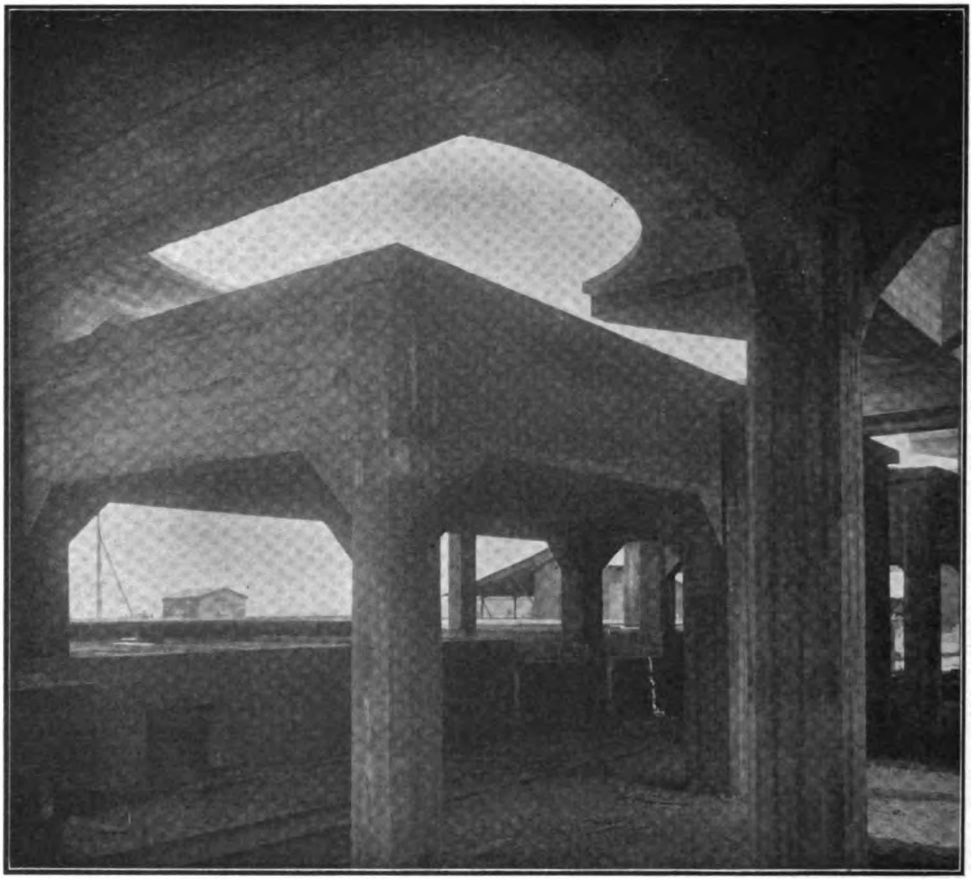

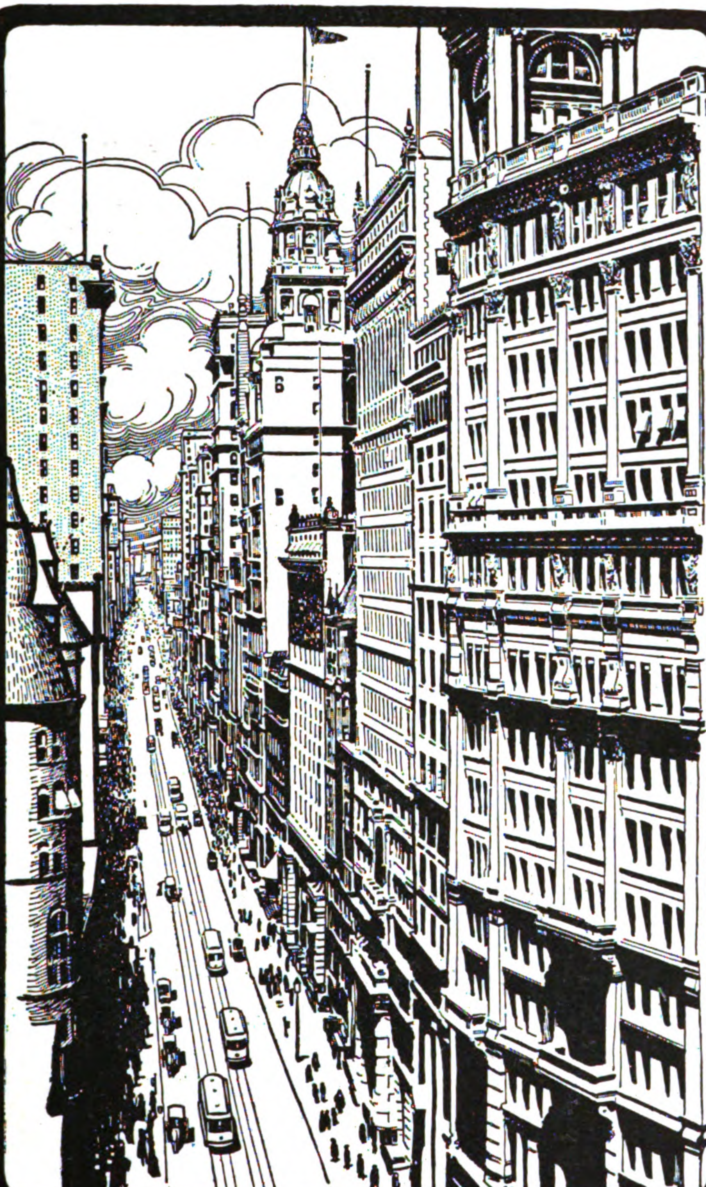

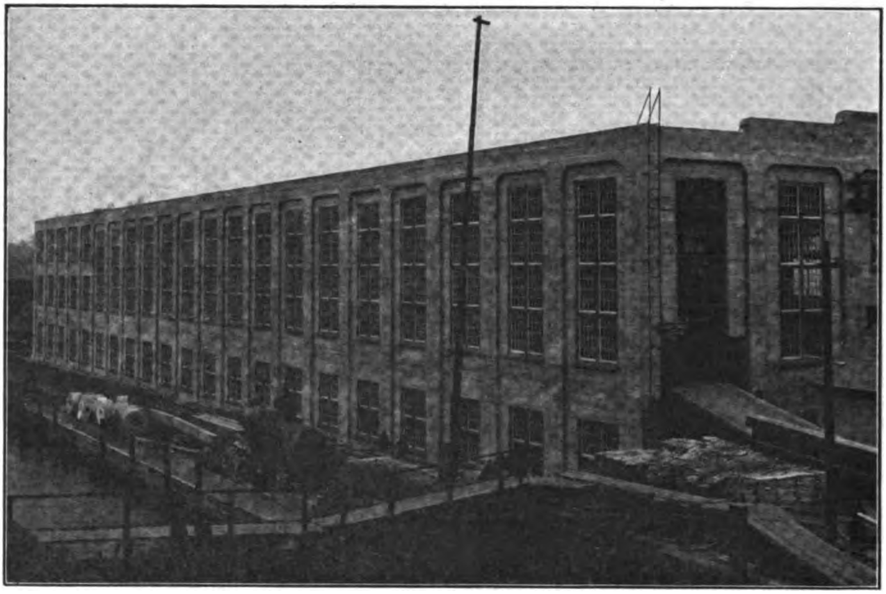

Paper Mill of Reinforced Concrete at Willamette, Or., built by Pacific Construction Co.

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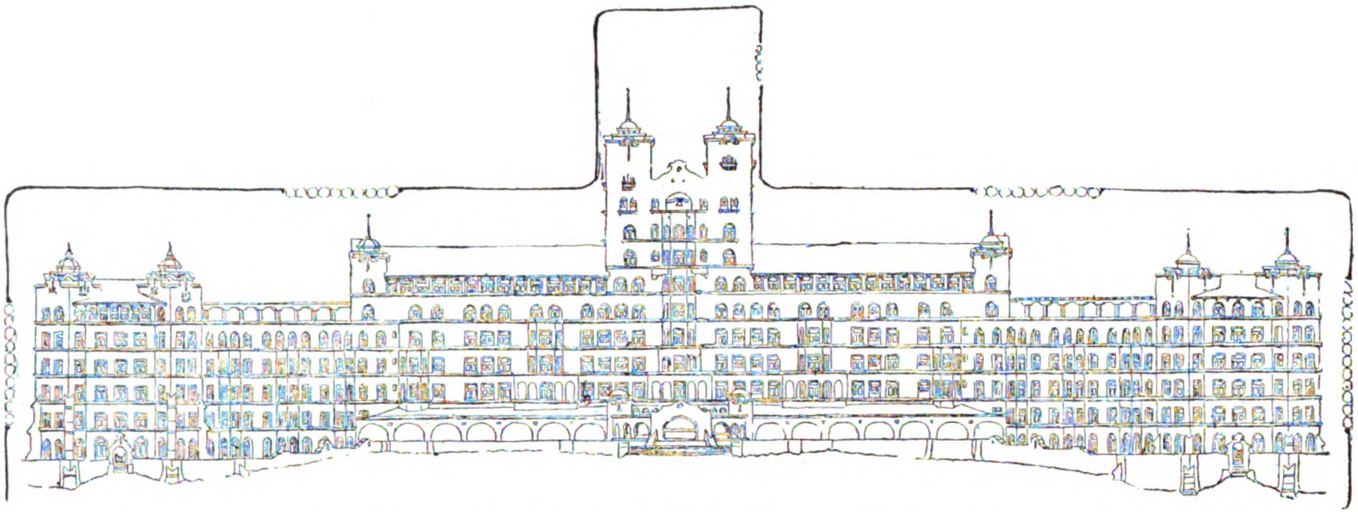


Front Elevation of New Tourist Hotel, Pasadena. Charles F. Whittlesey, Architect

The Hotel Wentworth is now in course of construction at Oak Knoll, near Pasadena, and is to be completed in December. The main building will be six stories in height and the fifty-foot square tower will contain nine stories. An idea of the immensity of the structure may be gained from the fact that the distance around the building is about three-quarters of a mile. The building will cost $500,000.

THE

Architect and Engineer

Of California

VOL. VI. SEPTEMBER, 1906. No. 2.

Reinforced Concrete Casing for the Protection of Piles in Wharf Construction

By F. A. KOETITZ

Member of the Technical Society of the Pacific Coast and Vice-President and Engineer of the Pacific Construction Company

DURING the many years of my experience in construction work I have often wondered why some good practical means for the effective protection of wooden piling against the ravages of marine life and even against general deterioration had not been found, and from time to time I have investigated many so-called "pile protections," always to find them wanting in one or another necessary essential. After giving this matter considerable study I have finally designed a system that I am certain will prove effective as a protection, which, being relatively cheap, can be used in many instances without any wooden piling, and it is the object of this paper to bring this system before the members of this Association.

The main feature of this construction is a reinforced concrete casing of practical length, or sections of such casing joined together, and with them either to encase wooden piles or to replace them entirely. When properly placed, in any of the ways in which these casings would be applicable, they are then to be filled with concrete and are ready to receive the superstructure.

The casings may be made of almost any desired diameter and with any preferred reinforcement, and for those of 18 in. to 24 in. diameter the shell need not be over 1¼ in. thick, larger diameters to be proportionately thicker, and the casings are, therefore, easily handled.

Fig. 1 shows two such sections of the casings joined by a simple sleeve that is inserted and properly connected at the place of manufacture. This connection is designed for light work only, such as protecting piles or certain portions thereof, or for repairing old piles. The bottom forms a shoe and at the same time serves as a guide in sinking the casing over the pile.

Fig. 2 shows a casing for heavier work, to be used more in the nature of a cylinder, with various sections joined together by proper cap, splices and shoe of metal, and the desired number of longitudinal rods. The shoe, if preferred, may be made of concrete similar to that in Fig. 1. In this case, the sections are assembled at the site of the work, as needed; they are supported, while being sunk in place, by rods, and when placed these rods are embedded in the concrete filling and form an additional reinforcing of the concrete and an absolute bond of the joints.

Fig. 3 shows these casings in the construction of trestle bents or

Fig. 2.

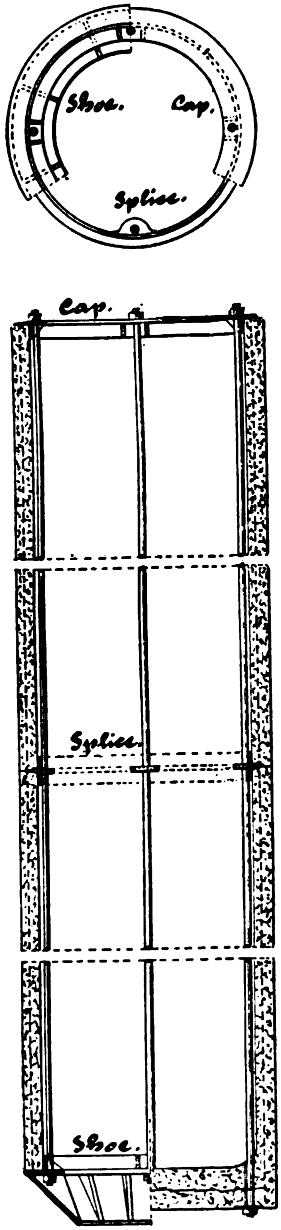
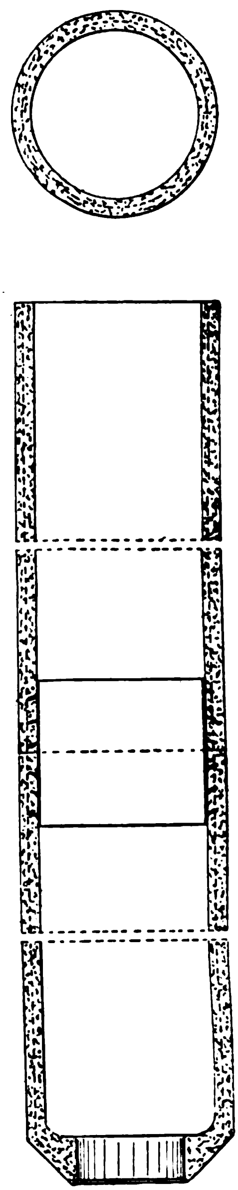


Fig. 1.



piers, with cap of wood or steel, anchored to the interior concrete, also with wood or steel bracing, attached in an approved substantial manner.

Fig. 4 shows the use of casings in conjunction with a reinforced concrete top work for piers or trestle where the head room is small and only a shallow bracing can be used. This combines the bracing and main girder all in one and will be found very rigid and durable.

Fig. 5 shows the use of the casings in the construction of wharves where they are admirably adapted to carry a reinforced concrete floor construction. Such a wharf would be almost indestructible, requiring practically no repairs, and would be entirely fireproof. It should be obvious to any builder, that such a wharf must be a better investment than a wooden one under almost any condition. Where this wharf is used for docking vessels, it should be surrounded, of course, with the usual spring lines of wooden piling.

While the upper parts of these casings are suitable for any style of superstructure, the lower parts can be constructed and adapted to fit almost any kind of foundation.

Fig. 6 shows, perhaps, the most common requirements. This consists of driving a pile to its proper bearing capacity, of cutting off the pile, thus driven, at the desired level (or of cutting off an old pile at such level), of sinking the casing over the pile to the required depth for the protection of the pile, of pumping out the casing and of filling the interior with concrete. The lower shoe, as shown, forms a guide to keep the casing always at a certain distance from the pile, so as to assure at least a certain fixed thickness of concrete between the pile and the casing. The conical shape of the shoe tends to throw the soil or mud away from the pile and will allow only a minimum amount to enter the casing. It also serves to compress the soil at the bottom, which gives additional bearing capacity to the pile. It also forms a practical seal against the ingress of water between the pile and shoe, which will allow the water to be pumped out, and also any mud which may have entered, before placing the concrete filling.

Fig. 7 shows a case where, for some reason, it is desired to sink the casing with hydraulic jet first and then drive a wooden pile with a follower to a firm bearing through and below the bottom of the casing. The jet shoe of the casing is attached so as to disconnect easily from the casing, and is shaped so as to act as a shoe for the wooden pile.

Fig. 8 presents a case where rock or other firm stratum is reached. The bottom of the casing in this case is closed except for a connection in the center for a water jet pipe, by which means it may be placed in the usual manner. When proper bottom is reached, cement grout may be forced through this water pipe, which will serve to cement the casing to the bottom and give it a firm bearing.

Fig. 9 shows how an additional connection to the bottom may be made if desired. Drive with a follower a short steel pile, or pin, through the bottom of the casing after it has been sunk to place and bottom grouted. In this case the metal plate which closes the bottom of the casing, during the process of sinking, is so constructed that it will easily disconnect from the casing when the pile is entered, and the plate is of such thickness that it will readily shape itself to conform to the point of the pile when the pile is forced down to place.

There is provision for making different lengths of piles by adjustment of the top sections. After the foundation is secured and casing built up, if the top section is found too long, this section may be removed and one of exact required length substituted. In case a section is found to be

Fig. 4.

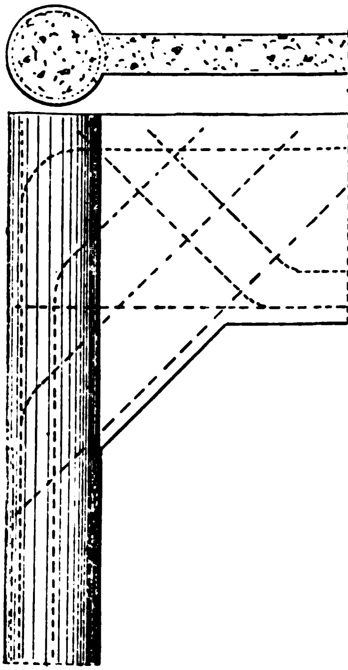


Fig. 3.

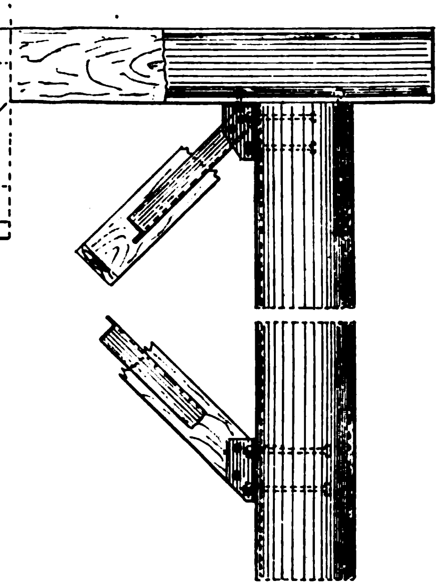


Fig. 5.

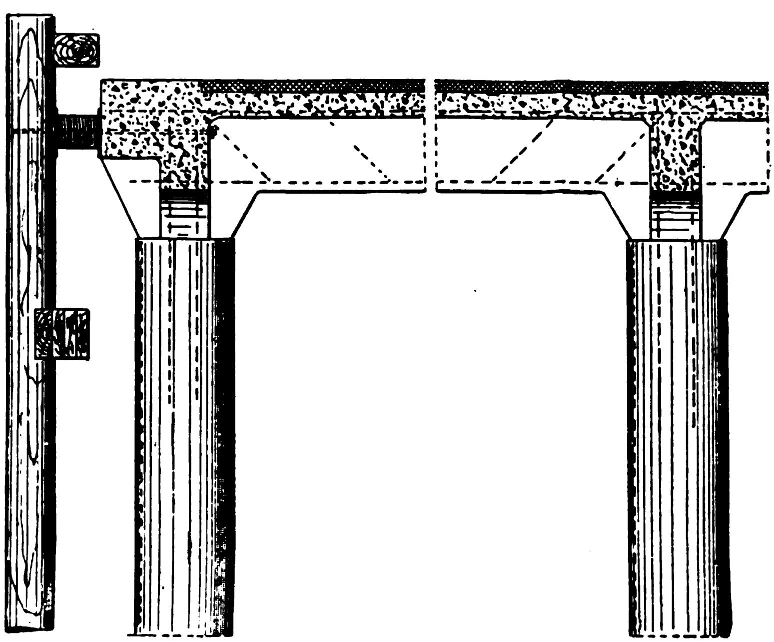


Fig. 6.

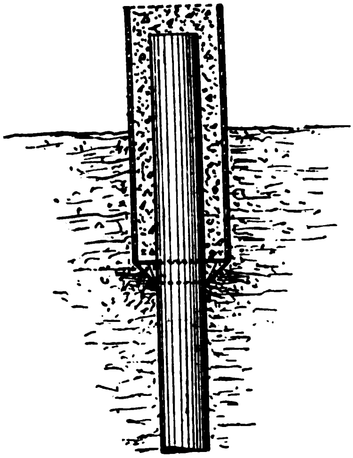


Fig. 7.

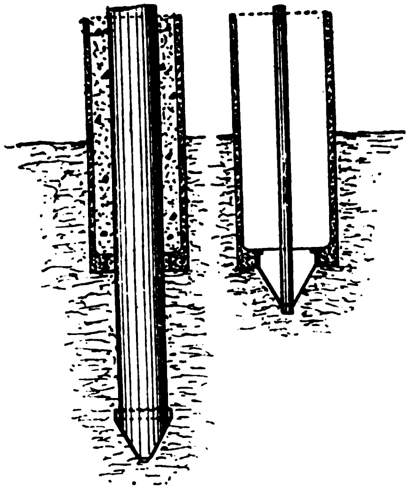


Fig. 8.

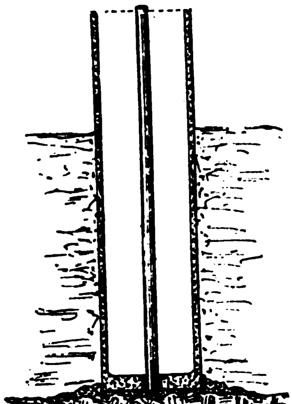


Fig. 9.

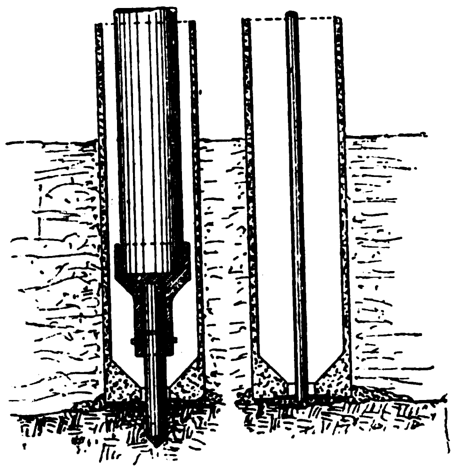
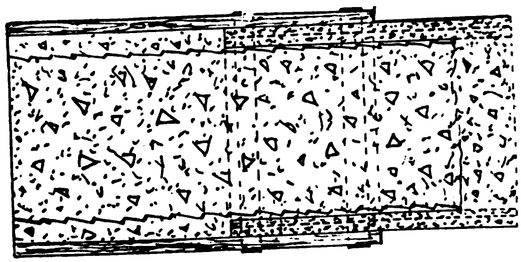


Fig. 10.



too short, or it is not convenient to remove it, when short, the pile may be lengthened, as shown by Fig. 10, by placing a circular detachable form around the outside of the casing, placing the proper amount of reinforcing inside and filling the whole space with concrete, as desired. This same method may be used in constructing the upper concrete work shown in Fig. 4.

It would seem apparent, without going further, that it is easy to apply one or another of these examples to any requirement.

In closing, I may be pardoned for mentioning some of the advantages of this system over other similar forms of construction. Concrete, no doubt, being the principal requirement for good results, it becomes simply a question of using it in the best and most economical manner. If used in steel or wooden cylinders, the outer casing, it must be admitted, should be considered as only temporary, and the size of the concrete column is so made that, when the outer shell has served its purpose as a form, after due time, this concrete must stand by itself.

It being more or less difficult to determine just how successfully concrete in cylinders has been made, and also for various other reasons, the cross section of the concrete column is usually made large which gives a correspondingly large exposed surface to the action of water or waves in the pier. With this concrete casing the best and most durable part of the column is on the outside, and the cross section may then be materially reduced and, with it, of course, the exposed surface. This naturally leads to the question of cost or rather to relative cost of this construction. It may be easily demonstrated that since the volume of the concrete, which is the most expensive item, is greatly reduced, the price, complete in place, for the same length and bearing capacity of the structure is at least no more, and probably in most cases rather less, than that of any of the other methods used, even allowing for the more expensive outer casing, and I am very certain that its superiority is apparent.

* * *

The Inventor of Reinforced Concrete

IN 1854 Mr. W. B. Wilkinson, "a plasterer and manufacturer of artificial stones," of Newcastle-on-Tyne, took out a patent for fire-resisting construction in which the fundamental principles of modern reinforced concrete construction are embodied. Not only does this patent cover the reinforcement of floor slabs with crossing iron bars, but it shows how to reinforce concrete girders or beams to sustain these floor slabs. It is plain from the patent specification that Mr. Wilkinson clearly understood the subject, and had practically investigated the principles involved. His was no blind leap in the dark, and it seems that he must be acclaimed as the real inventor of modern reinforced concrete, where the metal is only introduced to strengthen the concrete in tension, designed on a scientific basis. This patent also is the first to suggest the construction of tubular partitions with keyed joints. He founded the firm of W. B. Wilkinson & Co., Ltd., of Newcastle-on-Tyne, which is well known for its work in plain and reinforced concrete today. It is stated by this firm that some years ago a fire unfortunately occurred at their offices and destroyed all the old books and papers, so that the particulars of early contracts (of which many important ones are known to have been carried out in the sixties and seventies), executed by the firm have been lost.

Mission of San Luis Rey

The Old California Missions and Their Influence on Modern Design*

By W. L. B. JENNEY, Architect

THE story of the old missions of California dates from the establishment of the first mission at San Diego in 1769. These old missions were military posts as well as religious centers. They were directed and assisted by the old Jesuit Missions of Mexico that presented church property as well as such agricultural tools, implements, seeds and animals as they were able.

At San Diego the military and navy assembled on the site selected for a presidio, where a temporary altar was erected and bells, hung between the trees, were rung. A crowd of natives collected to witness the ceremonies. These natives were of a very low order both physically and intellectually, nearly naked and crudely armed. They spoke a very rough, barbaric language that the fathers were forced to learn before they could impart any instruction to the ignorant savage.

The order from the king to establish the San Diego Mission included a mission at Monterey. The military detail intended for Monterey halted at San Diego only for a short rest and then pushed on. They failed to find the locality and soon returned to Mexico. A year later a new expedition was more successful and established the Mission of San Carlos at Monterey. They were soon joined by a vessel, the San Antonio, which had been sent from Mexico. A chapel, work shop and dwellings were clustered along the beach, at first of a temporary character. The locality was favorable, the live stock multiplied rapidly, game was abundant. By gifts of gay calicoes and trinkets the natives were attracted and soon became attached to the fathers, who taught them not only religion but trades and agriculture, as they did at all the missions, so that large numbers soon became very useful to themselves and to the mission.

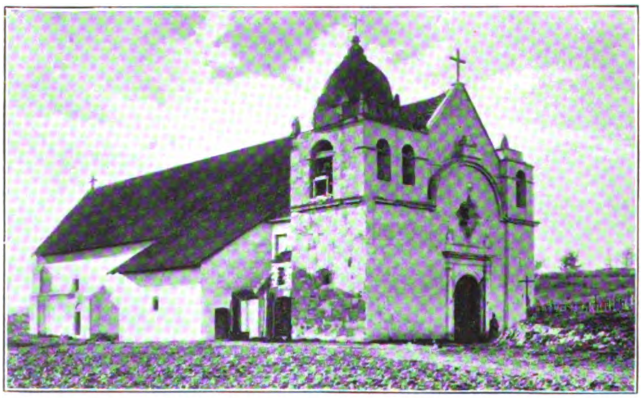
A year later the San Antonio again arrived from Mexico bringing supplies and a relay of ten priests. Now the fathers were able to establish new missions. The San Antonio July 14, and San Gabriel September 8, 1771; San Luis Obispo, September 1, 1772.

The missions suffered severely from occasional raids and other criminal violence of the natives, causing the death of several fathers and the loss of property, particularly horses, by theft. When the thieves

*Reprinted by special permission from the Inland Architect and News Record.

Church, Los Angeles
Maginnis, Walsh & Sullivan, Architects

Sketch for Residence of Mrs. Hollenbeck, Los Angeles
Morgan & Walls, Architects



Carmelo Mission

were followed closely they abandoned the horses, which ran wild, and these multiplied rapidly, resulting in herds of considerable size roaming over the country.

The Bay of San Francisco to the north had been discovered and the Mission of San Francisco founded, and shortly after the Mission of San Juan Capistrano.

San Juan was evidently the finest mission up to this time, although built almost entirely by Indian labor. It was seriously injured by the earthquake of 1812. Early in the year 1779 the Mission of Santa Clara was established upon the fertile plain of San Bernardino. The fathers had considerable trouble with the Indians stealing cattle and horses, until some of the thieves were caught and executed, and from that time they stole no more cattle. In 1812 and 1818 earthquakes almost destroyed the buildings of the missions generally, but worse than all other elements of destruction is what is called secularization, which seems to have been a general taking possession of the missions by the government, from some very short-sighted, mistaken policy, said to be political. The cattle and lands and even the buildings were sold and the poor Indians were deprived of what they had acquired by industry and long possession. The same dismal tale is told everywhere.

Of these old missions, and there are about twenty scattered along the coast from San Francisco to San Diego, the most artistic architecturally is that of San Luis Rey, founded in 1798. It is still in large part in good preservation. This mission is in progress of restoration in what the English call a "pious restoration"; that is, as near as possible to its original condition in every detail. One of the well preserved, or, rather, restored missions is Santa Barbara, located on a small bay near a large village, which was governed by a chief very friendly to the missionaries. The Indians assisted to erect the building. The church suffered much in the great earthquake, so that it was rebuilt, 1815-1820, with strong walls of huge stone with good buttresses, and a six-bell, two-story tower. There is a fine garden in the cloister or patio and a fine large fountain in front of the church.

The entire mission is well cared for and much visited by tourists. The proudest edifice of this time was San Juan Capistrano, founded in 1776, and reduced to a ruinous condition by the earthquake of 1812. Miss Powers in her admirable little book on the Missions of California, styles it the Melrose Abbey of the West, as she fancied the impression therein by moonlight closely resembled each other. Unless there is something lacking in your soul, a trifle nonsensical I think.

As the old missions of Mexico gave birth to the then new missions of California, naturally we must look to Mexico for the origin of the type, evidently derived from the Spanish Colonial Renaissance, but we must bear in mind the great difference in the environment, the lack of skilled labor in California, and that the architects were in most part the Franciscan Fathers, who were not professionals. The material at hand in California was often the "adobe," which, owing to the necessity of quick work, frequently served a good purpose for the temporary building.

Later the churches were often built in a much more substantial manner of cut stone and mortar with good buttresses.

From necessity the missions architecturally are very simple, while those of the Spanish Colonial in Mexico were exceedingly rich in decoration, often too much so. (See the Chihuahua, the best specimen, I think, in Mexico.) In the mission church the small amount of decoration used

Mission of Santa Barbara

was usually confined to the sky line of the gable end, to the principal entrance and the architectural features of the tower, which usually had two rather low upper stories provided for bells, roofed by a dome, surmounted by a small temple-like finial. The architectural details were usually of Doric Renaissance. The sky lines of the gable recall somewhat the Elizabethan. There is often a cloister of considerable dimension, sometimes, as at Santa Barbara, planted as a garden. The walls are often strengthened by buttresses.

The characteristic features of the mission buildings and the mission style when adapted to modern work, of which I have given numerous examples, the traditions of the missions preserved in our modern designs, are in large part principles rather than the reproduction of architectural features. It is true that one often sees that striking gable end cut in a stereotyped meaningless sky line, the use of which is, as I heard remarked, rather the abuse than the adaptation of the mission style. There are other architectural features that are more sensible that seem to mark the style—such as simplicity with good proportions, broad projections to the tile roof, corridors, verandas or arcades—a courtyard, often planted as a garden.

Sometimes one sees the mission-like tower and buttresses and a Doric doorway. Then again one sees a design that suggests to the mind the mission style without there being apparently any special reason.

A close study shows that the modern design bearing traditions of the mission style consists in its principles of good architecture generally, such as satisfying the requirements in the most direct manner, adaptability to the environment, the most economical use of the material, the use whenever practicable of the material at hand in the most skilful manner, the using of proper proportions in all parts with a judicious and agreeable fenestration, etc.

The station on the Santa Fe at Albuquerque is a very artistic and picturesque design that might have been designed by an old mission architect. The environment of the Indians and their adobe huts are near by.

I find this to be true that wherever I find a dwelling, or I may say a building, that suggests the mission style I always decide at once that it deserves study and usually end by admitting that it is a good design.

Mission of Santa Barbara

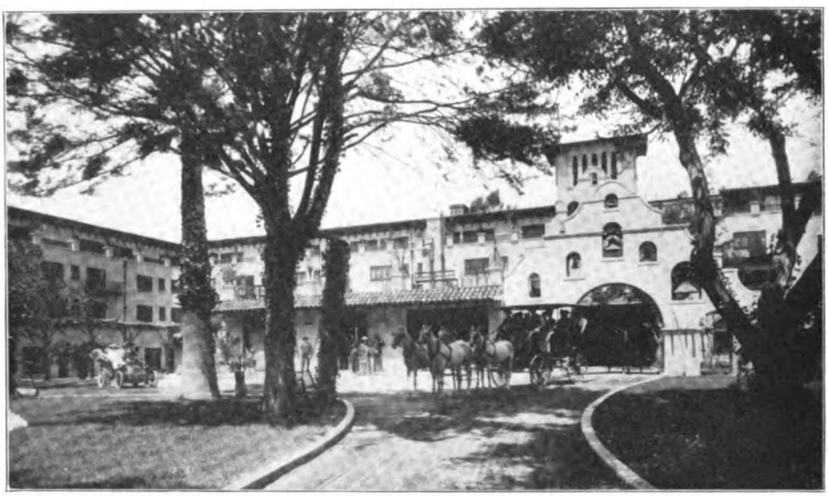
I found in the city library (Los Angeles) a very fine work entitled "Spanish Colonial in Mexico," by Sylvester Baxter, published in Boston by T. B. Willet. One folio volume of text and five volumes folio of photographs, nicely mounted. It is well worth the perusal of all interested in the subject.

Mrs. Hollenbeck's residence, near the old folk's home, she has built at Boyle Heights, Los Angeles, shows the mission influence.

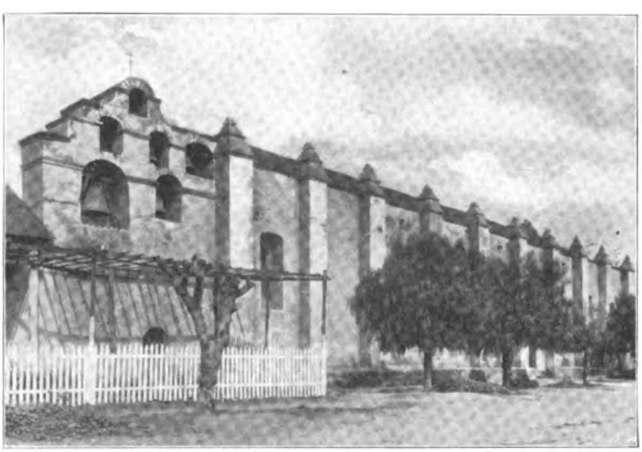
In Los Angeles and the environment there are more cottages per square mile than I think can be found elsewhere. Those of one story are called bungalows; many have a story and a half, and the majority show a mission influence, but not the church gable seen in Mrs. Hollenbeck's residence and in the typical mission residence. This belongs to the church and not to the habitations, though to many it is the characteristic of the style. The architects of Los Angeles have by degrees worked up a so-called mission style of their own, omitting, however, almost entirely the church gable, confining themselves to features of the habitations. The roofs are usually quite steep, 40 to 45 degrees, with projecting eaves, often covering the porches or verandas. Frequently, however, the verandas are behind an arcade as in the typical mission residence.

In the cottages or bungalows the chimney is usually outside, often built of brick dotted with small boulders. The habitation is set well back from the street with a lawn in front, decorated with the date palm, the royal palm, and the California fan palm, the picturesque dracena, many fine flowering small trees, and beds of tea roses and borders of flowers. When the grounds admit of it there is the characteristic pergola covered with climbing roses or vines. When the site is high it is terraced and a retaining wall built on the sidewalk line, with the ground behind the wall filled in high and sloped to the face of the wall, which is usually built of boulders laid in cement mortar with the joints kept well back from the face, the rounded face of the boulders projecting. Along the inner face the wall is planted with all of the trailing vines, of which there are so many here, which are filled with pretty daisy-like flowers in many colors. I saw one terrace wall covered with the trailing rose geranium almost covering the face of the wall with its

Mission of San Antonio de Padua



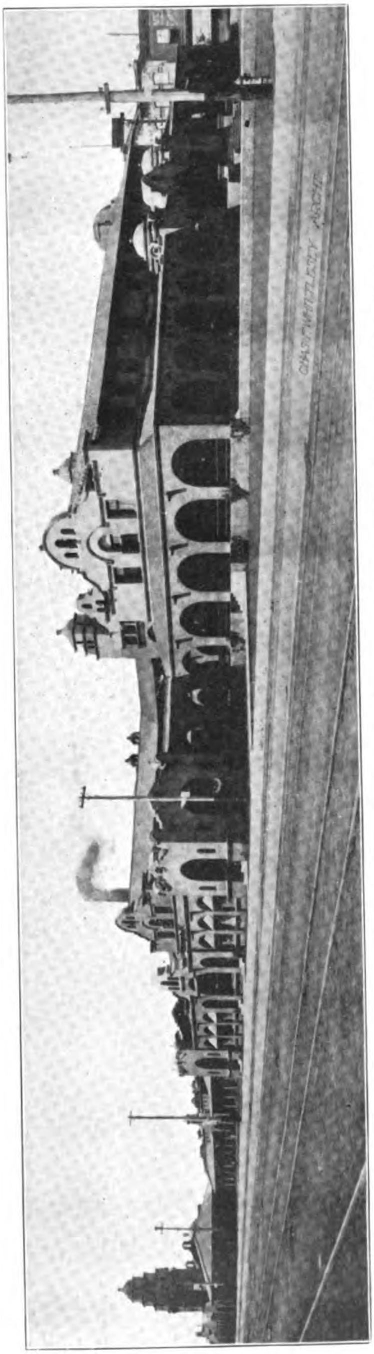
Mission Hotel, Riverside



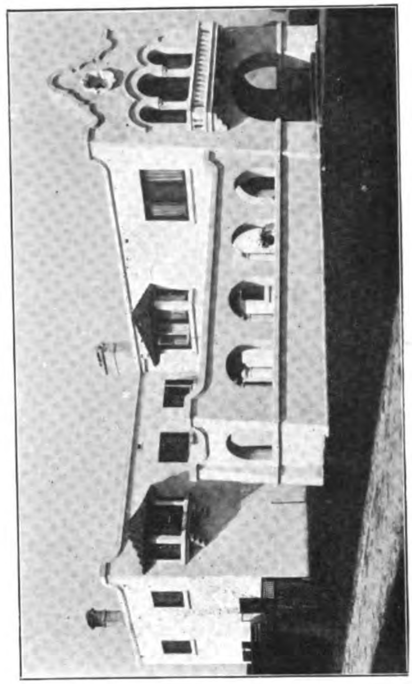
Mission of San Gabriel

A Bit of the Riverside Hotel

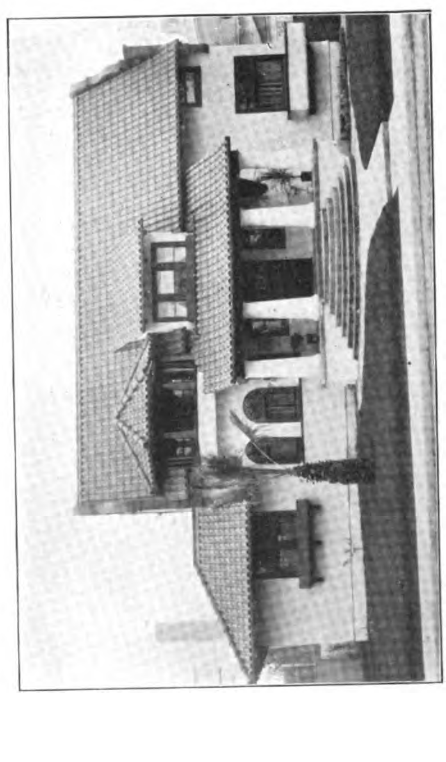
A Corner of the Riverside Hotel



Station and Hotel for Santa Fe Railway, at Albuquerque, N. M. Chas. F. Whittlesey, Architect



A Los Angeles Residence. John Parkinson, Architect



Residence of Mr. Severance, Los Angeles. J. C. Newsom, Architect

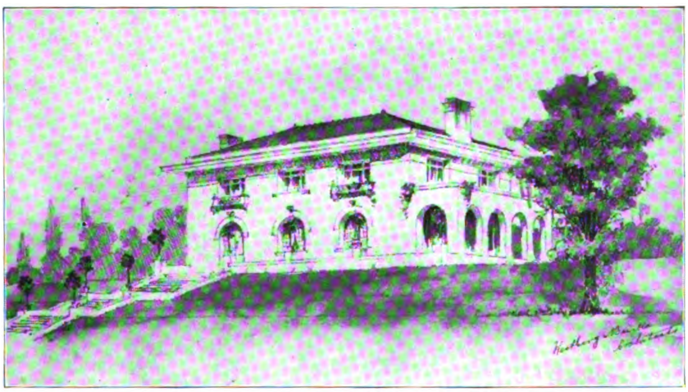
Residence of Mr. Bartlett, Los Angeles
C. F. Whittlesey, Architect

bright rose colored flowers and green leaves, making a very pleasing effect.

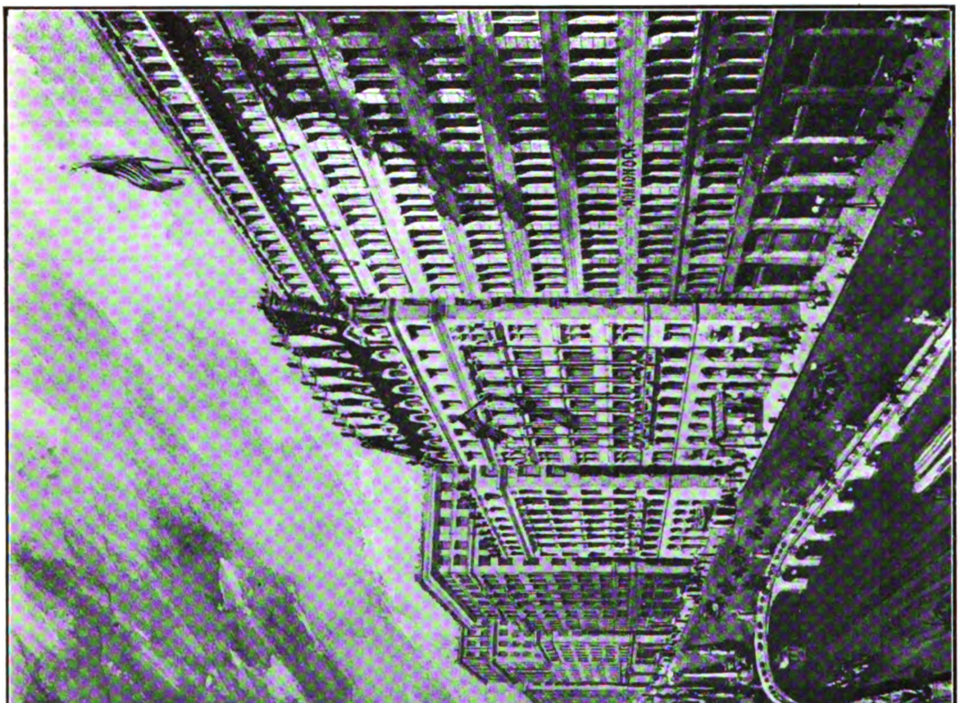
The lots are usually separated by hedges. There are many hedge plants that grow well here and are always green, and usually in flower, such as the laurestine, which is used so much in Italy; the calla lily, red geraniums, a continuous bloomer here, and many others.

Flowers here grow so easily and cost so little that every cottage, however humble, is surrounded by a garden. Most every one has also an orange tree or two and a lemon, ornamental as well as useful.

Riding near an old mission I saw an aged priest sunning himself. He looked so characteristic of his environment that the picture suggested "A Peaceful Reverie."



Sketch for a Residence
Westberg & Burke, Architects



Proposed Subway for Lower Market Street, San Francisco. Clay N. Burrell, Des. Reed & Co., Engineers

A Subway Without Excavation

By WALTER G. HOPKINS*

ABOUT once in so often some thinking but comparatively unknown engineer evolves an idea so bold and original, and withal so feasible and practical as to attract widespread attention.

Such an idea is embodied in a proposition recently made by Reed & Company to the city of San Francisco to construct a complete subway in Market street at an expense of some five and a half millions of dollars and to accept thirty-year, four per cent bonds in payment for the same, work to be completed within two years.

The plan, in brief, is to construct an elevated roadway over Market street from the Ferry building to Third street, where the boulevard intersects in the present level of Market street. The framework of this boulevard is entirely of steel and reinforced concrete, covered with glazed white tile. The roadways of the boulevard are wide and paved with asphalt, while the sidewalks are made up largely of prism glass.

The plan provides for a center park extending the whole distance with ornamental trees, shrubs and fountains. The upper boulevard level is exclusively for pedestrians and pleasure vehicles, while the electric road occupies its present position upon the lower level. A large number of circular switches are provided, however, opposite the central entrance of the Ferry building, with a dispatcher in charge, who, by the simple turning of a lever permits each car, as it arrives, to pass upon the proper switch and to stop only before a designated platform.

The heavy traffic of the water front passes either into the main subway or under it by means of a short sub-subway. At the several street crossings are entrances for the ingress and egress of passengers. Each of these corner stations is provided with lavatories and the usual requisites of modern depots.

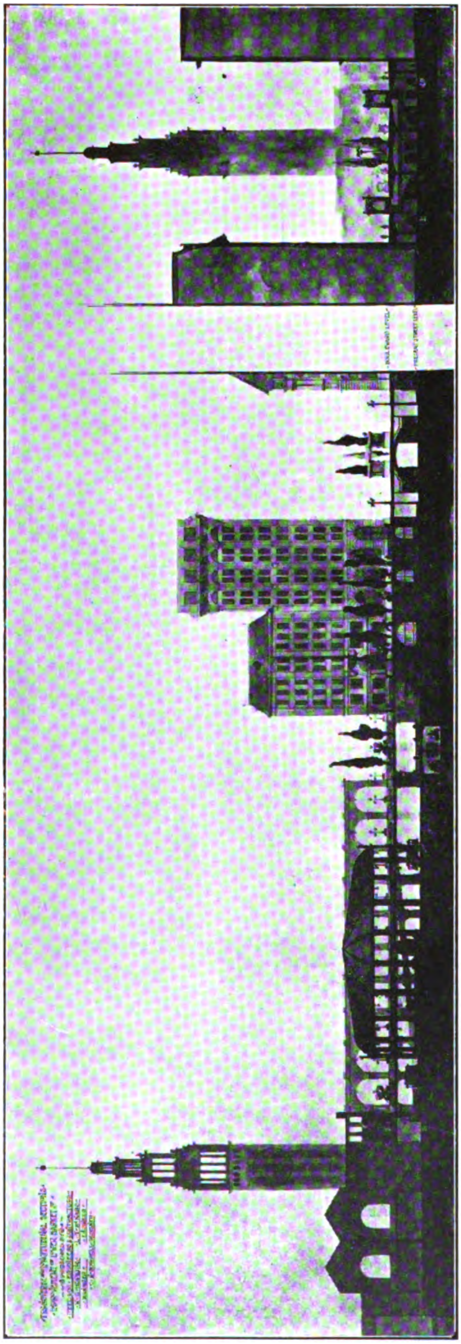
A steam railroad track having connection with all the trunk lines now or hereafter entering San Francisco is provided for in the space adjoining the electric lines on the lower level, with switches leading into business houses en route and passing out into adjacent cross streets in the wholesale and manufacturing districts, thus providing perfect freight facilities. The space adjoining these steam railroad tracks is set aside for heavy cartage, thus permitting freight and goods for local delivery to be handled from the basement of all buildings en route.

Throughout the entire length of the subway no pedestrian is permitted to cross the track at grade, thus insuring a much greater speed in safety than could be otherwise obtained. At the juncture of Third, Market, Kearny and Geary streets a short cross-subway is provided to permit the cross-town electric lines to pass under without interference with the Market street lines.

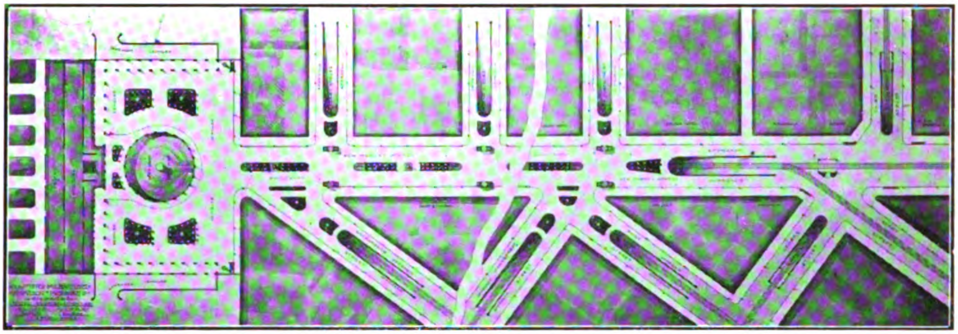
The sewer, gas, water and salt water pipes and electric wires in conduits are all provided for in an improved manner beneath the lower level.

From an engineering point of view a peculiar advantage in the construction of the subway under the Reed & Company plan and one which at this time will strongly appeal to San Francisco citizens generally, is that this steel structure is tied in a most substantial manner to the buildings upon either side of Market street, thus uniting and strengthening

*Mr. Hopkins is Vice-president and Managing Director for Reed & Company with offices in San Francisco, Chicago, Santa Fe and Los Angeles.



Transverse and Longitudinal Section, Improvement of Lower Market Street, San Francisco
Reed & Co., Engineers



Plan of Upper Boulevard Level, Improvement of Lower Market Street, San Francisco
Reed & Co., Engineers

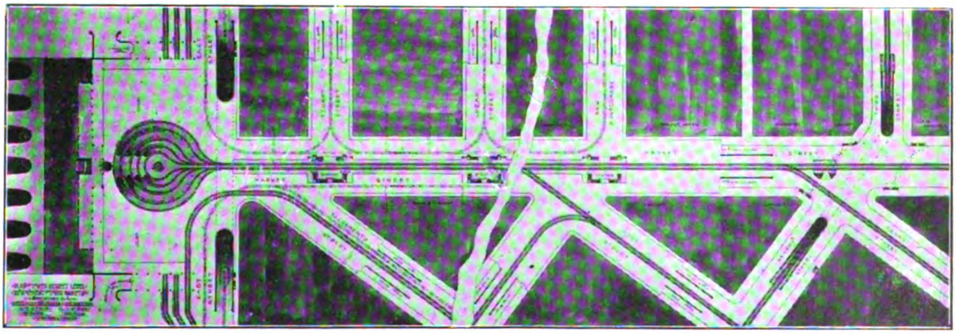
materially all buildings en route and rendering this section of the city practically impregnable to earthquakes and similar disasters.

To a person familiar with the conditions as they now exist the plan can hardly fail to call forth favorable comment. The grade of Market street from Third street to the ferry is ideal for an enterprise of this kind. By the proposed plan the boulevard intersects the Ferry building at the second floor, permitting the arched design of the building to be carried out in a magnificent Court of Honor.

Owing to the recent disaster there is not a permanent building en route which will interfere in the slightest degree with the carrying out of this plan.

In most cases, in the building of subways, millions of dollars have been expended for excavating; many millions more have necessarily been spent in caring for the existing water, gas, sewer pipes, conduits and other underground necessities, as well as insuring the safety of the overhead buildings. Under this plan all this great excavating expense is avoided.

There can be no question as to the urgent demand for something of this kind in San Francisco. Any person leaving the Ferry building must have noticed with alarm the chaotic conditions which exist in the confused mass of humanity dodging in and out among the various electric and cable cars, the trucks, the carriages, the automobiles and other vehicles, each endeavoring to discover some particular car, or reach in safety some point on the opposite curb. This plan absolutely cures that difficulty in the dividing of traffic.



Plan of Lower Street Level, Improvement of Lower Market Street, San Francisco
Reed & Co., Engineers

Subways, in spite of their great cost, have universally proved a most satisfactory and profitable investment financially; in the saving of life and limb and in the wonderful shortening of distances. It is difficult to estimate the many advantages or the wonderful beauty of this plan if carried out in its entirety; all that can in any way be construed as objectionable to the eye is cared for conveniently in the subway, while all that is pleasing is brought out in a most elaborate manner upon the boulevard. The architectural beauty of the grand court, with its heavy arch border carrying out the design of the present Ferry building, of which San Francisco has so long been justly proud; the magnificent dome over the street car platforms; the abundance of space in the plaza with its display of fountains, monuments, grass plots, trees, shrubs and flowers; the highly ornamental electric light fixtures and hydrants; the uniformity of all lines; the sidewalks; the curbs; the potted palms and other decorations; the wide and imposing roadways occupied entirely by pleasure vehicles—all are features which combine to mark San Francisco as the most up-to-date city in America, if not in the world.

The expense of this vast improvement is, we feel, almost insignificant when compared with its many advantages and can, under the terms suggested, be easily cared for without hardship to any individual.

Whether San Francisco, in her stricken condition, will feel that she can grasp this opportunity remains to be seen—we sincerely hope that she may.

The drawings shown herewith were prepared under the writer's personal direction by Mr. Clay N. Burrell, the well-known architect of Oakland, while the actual surveys and estimates were prepared under the supervision of Mr. L. T. McNabb, the building superintendent for Reed & Company.

* * *

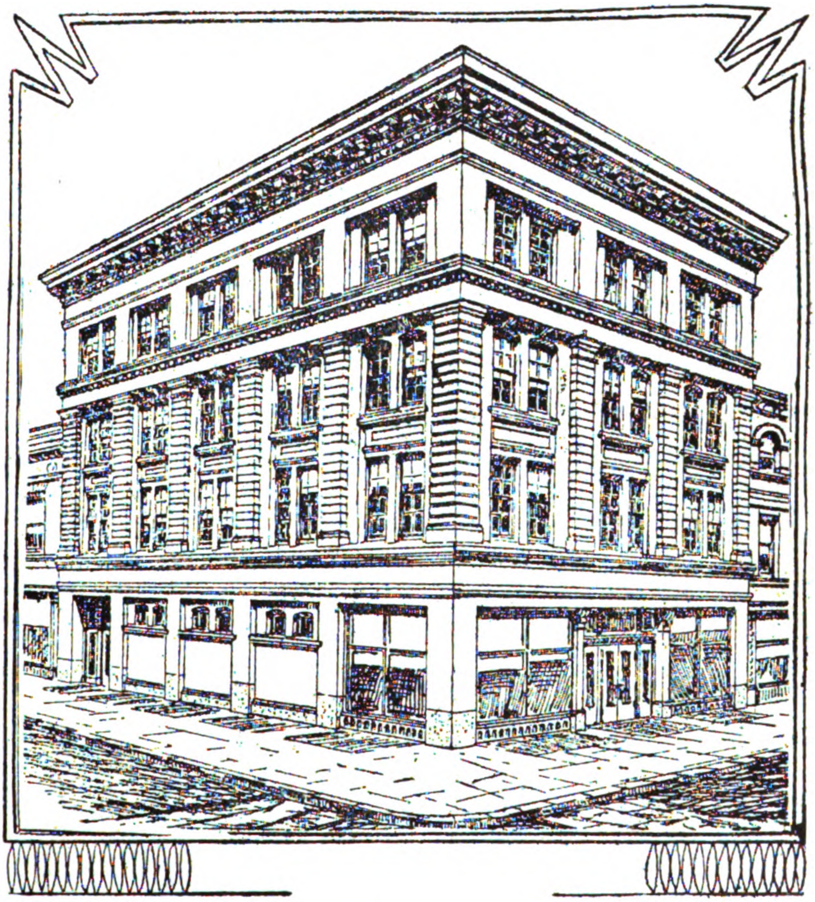
Houses Built While You Wait

MR. THOS. A. EDISON'S latest role is that of a benefactor to mankind, and best of all it is the working man who will derive the most benefit. His latest step consists in molding houses out of concrete in a single casting, complete in every detail, in four days. The method of procedure is described briefly as follows:

An architect will be employed to design dwelling houses of different designs; metallic molds will be made to correspond. The mold for each house will be made in detachable parts that can be screwed together easily to form an entire house. The mold for the whole house is set up, and concrete pumped into every nook and cranny. After four days the parts of the mold will be unscrewed and removed and the solid concrete house will remain.

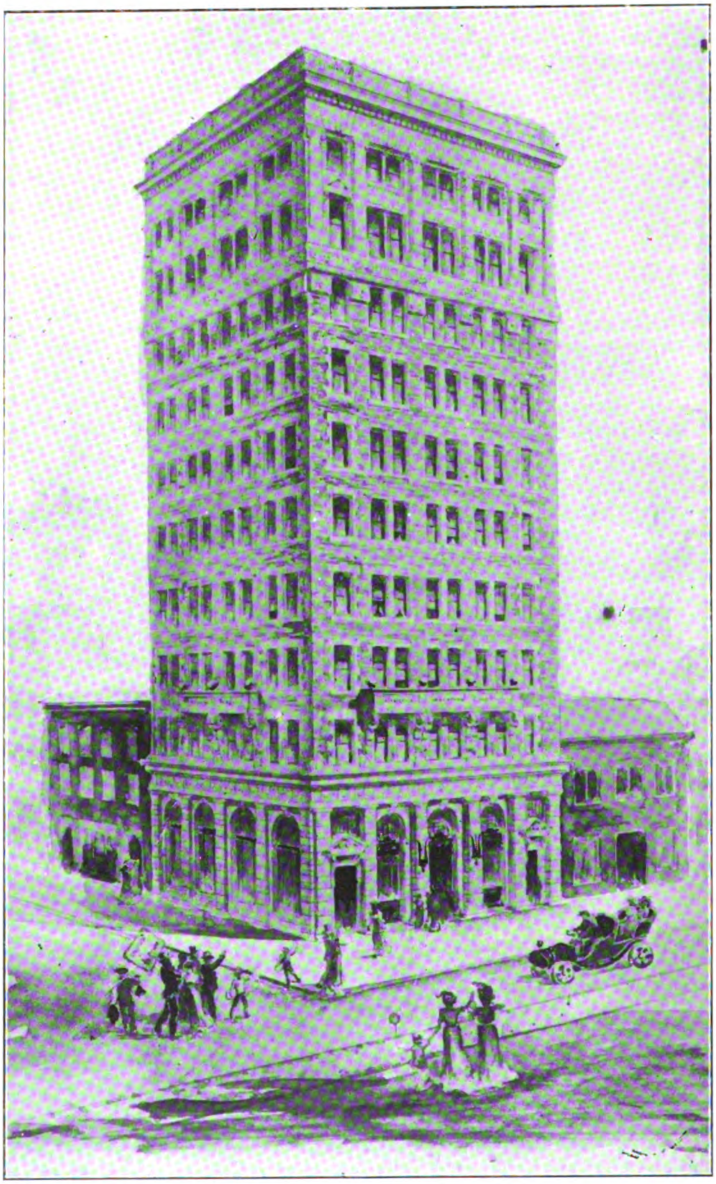
Mr. Edison claims that the house will be so complete that dormer windows, chimneys, spouts, inside cupboards, banisters, mantel pieces and even bath tubs will be formed in the cast in which the house proper will be made. Even the plumbing and gas piping will be of concrete and molded in the original cast. From each mold, the first cost of which with all its parts, is estimated at $25,000.00, an unlimited number of houses may be produced, because the parts of the mold may be detachable. It will be portable and one mold may be sent with little difficulty from town to town. It is claimed that about ninety houses could be built in one year by the use of a single mold, at a cost of $500.00 to $600.00 apiece.—Rock Products.

For The New San Francisco



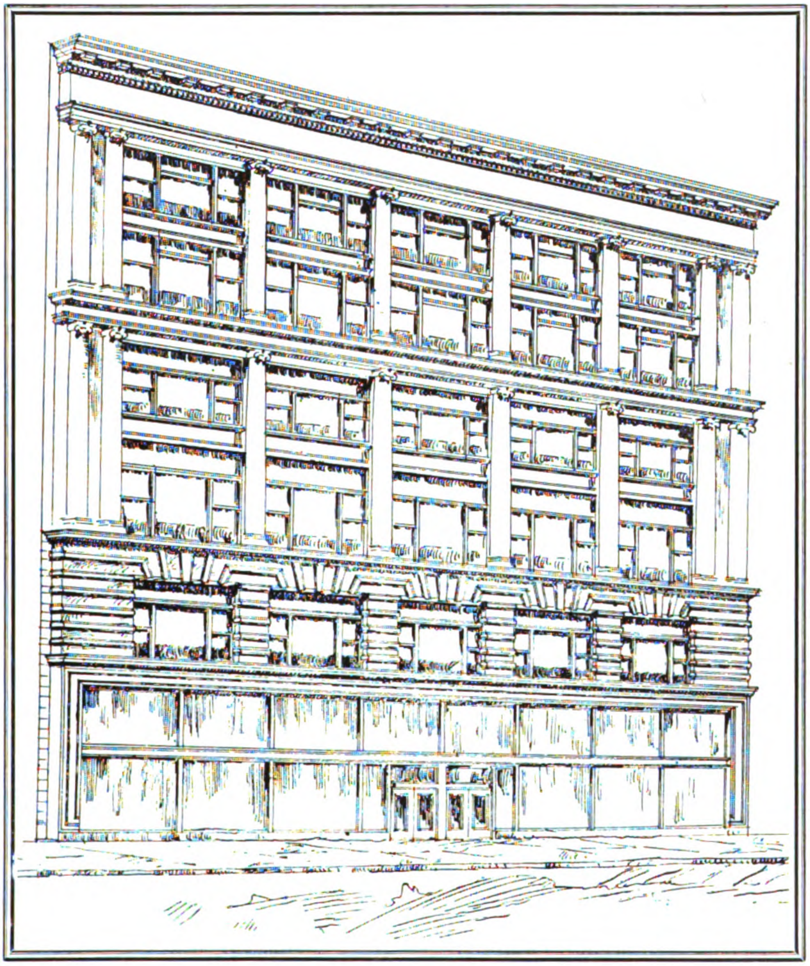
Bank and Office Building for Chas. A. Son, San Francisco
Clinton Day, Architect

For The New San Francisco



Accepted Design for Bank of Italy, San Francisco
Frank T. Shea, Architect

For The New San Francisco



The Hale Building, San Francisco
Reed Bros., Architects

The Macdonough Building of Reinforced Concrete, San Francisco
William Curlett, Architect

Change San Francisco Fire Districts

By P. H. BOSWORTH

THE history of all fires, both large and small, where the class A construction has been involved, has proved that fireproof buildings will burn, and burn readily, and all the fire-resisting qualities that architects and engineers can devise will prove ineffective so long as the building laws will permit a wooden building to be erected adjacent to or even across the widest street from a fireproof structure.

By a wooden building is meant a class C structure, which, to all intent and purposes, is a wooden building, being, as it is, merely a brick shell filled with wood. It is most certainly possible to add more fireproofing qualities to class A buildings than they now possess, but only at the expense of comfort and elegance and architectural beauty. This is not a condition to be desired if it can possibly be avoided, and it can be avoided by some such arrangement of the fire limits suggested in the following: To make the class A building as it stands today absolutely fireproof it will be necessary to divide the fire limits into districts: Class A district, class B district and class C district.

This does not change the boundary of the fire limits in any respect; it merely means that in a class A district no class B or C buildings can be built; in class B district no class C buildings can be built; however, this does not prevent class A buildings being built in class B and C districts, or class B buildings in class C district.

The district should be arranged something as follows: Class A district, both sides of Market street, from First to Ninth; both sides of each street branching into Market street for varying districts to be decided later on, and no one or both sides of streets parallel to Market and intersecting the streets branching into Market street where these streets are in the class A district for one or more blocks.

Class B construction should surround the above formation one or more blocks deep as a barrier against fire from the class C district. The class B district should have more stringent regulations, making the buildings at least semi-fireproof.

The balance of the fire limits could be given over to class C construction, with this exception, that no business or manufacture of a hazardous nature be allowed within the fire limits.

In effect this arrangement would mean that no fire could possibly start in the district given over to class A construction. Any danger from fire therefore would have to come in from the outside through the class B district. The danger of fires gaining headway in the class B district is slight, as the semi-fireproof construction is a great retardent; therefore the only danger from fire to the class A and B districts would come from the class C district.

A fire starting in the class C district would have very little chance, even under the worst conditions, as there would be no all-frame structures to spread the flames, and if enough solid walls were interposed between buildings, each building in class C district to have at least one or two solid walls as necessary from top to bottom of building without an opening, as a fire check, the flames could be confined, without water, to one or two buildings or at the most to one block, but allow that a fire gained enough headway in the class C district to reach the class B district it would have to burn through two or more blocks of semi-fireproof construction before it could reach the class A district, which is a practical impossibility; but stretching the imagination to the utmost, if a fire did work its way through the class B district it would necessarily be so weak that it would have absolutely no effect on the class A construction, even as it is now built.

This plan then would obviate the necessity of disfiguring class A buildings with wire glass, fireproof shutters and metal-encased doors, casings, window frames, etc., which at the best are extremely ugly, and would make it possible to continue finishing the finest buildings with the handsomest materials as formerly.

In the class A district would probably concentrate the wealth and business of the city, raising real estate values and rent accordingly, which fact would tend to compensate the property owners for being compelled to erect the most expensive type of building on their present holdings.

It would also be advisable to segregate certain businesses and manufactures of an extra hazardous nature to certain districts where additional safeguards could be thrown around them and where the damage they might do in case of fire would be confined to their own properties. By allowing them to mix promiscuously with other businesses and habitations they stand as a constant menace to adjoining property and have the effect of raising insurance rates on all property in their immediate neighborhood.

This plan would probably have the effect of lowering insurance rates in the fire districts and might have a tendency to keep the insurance rates down throughout the entire city.

* * *

The Man Behind the Pick

There has been all kinds of gush about the man who is "behind"—
And the man behind the cannon has been toasted, wined and dined.
There's the man behind the musket and the man behind the fence,
And the man behind his whiskers and the man behind his rents;
And thé man behind the plow and the man behind the hoe;
And the man behind the ballot and the man behind the dough;
And the man behind the counter and the man behind the bill;
And the man behind the pestle and the man behind the pill;
And the man behind the jimmy and the man behind the bars;
And the Johnny that goes suping on the stage behind the stars;
And the man behind the kisser and the man behind the fist;
And the girl behind the man behind the gun is on the list;
And the man behind the bottle, and when they were short of men,
There was some small rhymster warbled of the man behind the pen;
But they missed the honest fellow, and I'm raising of a kick,
That they didn't make a mention of the man behind the pick.
The man behind the pickax is the one we seldom know;
He's the only man in Christendom who never has a show.
You will find him in the brickyard, you may find him picking bricks,
But you fail to see him hold a job controlled by politics,
For he's the man that's always behind, behind, behind,
The pickax builds his muscle, while the shyster steals his mind;
He's the man that just a-coming; we can see he's learning fast,
For he's going to teach the grafter that his days are near the last.

—The Clay Worker.

Notes on the Construction of Steel Frames for Buildings *

By J. D. GALLOWAY

IT IS my intention to enter into only a few of the various matters pertaining to the design of a steel frame. The ordinary requirements for the design of the steel frame for a building are matters of common knowledge, and need not be dwelt upon here. The thing that we have to talk about is as to whether or not we have learned anything from the earthquake. However, a few other points might be mentioned, as indicating my preferences in this line of work.

I never use beams less than six inches in depth.

I do not use any metal less than 5-16ths of an inch in thickness. This applies particularly to the webs of channels. In my opinion anything less than 5-16ths of an inch in thickness is entirely too light. This is especially true when it comes to the riveting of brackets to the columns as there, in the case of thin metal, the bearing of rivets governs instead of the shear. Upon examining some of the wrecked buildings in the city, one will notice how columns made up of thin iron have torn apart like paper. Another reason for using metal not less than 5-16ths of an inch in thickness is that such thin metal usually occurs in small sizes and members near the top of a building. On such floors, the floor beams are of the same size as below; hence such things might come about as the attempt to fasten a fifteen-inch or a twenty-inch I beam to a six-inch channel column. The web of a six-inch, eight-pound channel is 2-10ths of an inch in thickness or about midway between 3-16ths and 1-4 of an inch. In my judgment this would be entirely wrong.

Personally, I have no use for cast iron columns. With proper safety factors they are not as cheap as steel. It is impossible to design brackets for beam supports of more than 40 per cent of the column strength and it is impossible to provide any form of connection that provides adequate bracing.

Another point which I might mention as indicating my line of practice, is the size of columns in the upper stories of buildings; theoretically, one should be allowed to diminish the size of columns as the upper stories of the building are approached. I do not do this for a number of reasons. There will, of course, be a slight saving of material should smaller members be introduced, but the connection of heavy beams to small sized columns is generally a very difficult matter. Again, in the wall columns of buildings, especially those in the fronts, there is generally a heavy eccentric load in the upper stories, due to the cornices and belt courses. I have had a number of cases where by properly considering the eccentric load of a stone cornice the area of the columns required for the eccentric load was as much as from three to four times the area required for the dead load alone.

The principal thing which engineers should learn from the earthquake is the absolute necessity of a thorough bracing of buildings. I will own up to some cases where I have designed buildings in which the proper consideration of bracing was not taken. However, in buildings in which the height was much over the least horizontal dimension, I have always introduced bracing.

In the Mutual Savings Bank there are two lines of portal bracing

*Paper read before the Structural Association of San Francisco.

Buckled Column in the Hotel Alexander, San Francisco

and two lines of cross bracing carried from the top of the building into the basement.

In the Shreve Building, which is not so high, in respect to its base, there are two lines of portal bracing.

In the Atlas Building, ten stories high, sixty feet wide on the front, the wall girders are connected at top and bottom to the columns, and the interior girders all have knee braces.

None of these buildings were found out of plumb after the earthquake.

In the St. Francis Hotel, where the height is not a very large multiple of the breadth, it was thought sufficient to depend upon the stiffness of the floors, and in the new portion bracing was introduced in a number of places. It remained vertical during the earthquake.

Other engineers have recognized the necessity of portal bracing in early days in San Francisco, the most notable evidence of which is that of the Claus Spreckels Building. In this building there are eight lines of diagonal bracing, made of adjustable eye bars, carried from the sixteenth floor to the foundations. Above the sixteenth floor, there are three sets of this bracing carried into the dome. In addition, from the third floor down, portal braces are introduced on each side at the four corners. In addition to this bracing, all of the main beams connecting the columns are fastened with knee braces.

The subject of wind bracing is one on which the engineer always clashes with the architect. The architect endeavors to secure as many openings as possible, both on the exterior and interior of the building, and this renders it extremely difficult to introduce diagonal bracing. However, in the light of recent experience, engineers should insist upon having wind bracing in buildings of even moderate height. I believe that if diagonal bracing be introduced, running from floor to floor much good could be done by the use of deep girders in the spandrel sections, connected to the columns by knee braces as large as the architectural features will allow for.

There are no means of calculating the stresses in a structure due to an earthquake, but, judging from the behavior of buildings such as the Shreve Building or the Claus Spreckels Building, I would say that if a building is properly designed for a wind pressure of thirty pounds

Showing Steel Girders on the Fifth Floor, Kamm Building, San Francisco per square foot on its superficial area, that it would be sufficient to withstand an earthquake of an intensity equal to that of April 18th.

I am inclined to think that in San Francisco this question of bracing is the most important one with which structural engineers must deal. They should examine critically all of their connections with an endeavor to make them as rigid as possible. Columns should be broken at every other story and should extend through at least two stories. They should be anchored to the foundations. The wind bracing should extend from top to bottom and should not be cut in two at the first story in order to make a store look attractive. If the wind bracing is left out of the first story, it might as well be left out of the entire building. It is an attempt to sustain a weight by a chain, one of the links of which is removed.

I regard the introduction of concrete floors in buildings as a very efficient means of bracing them. Terra cotta tile does not possess the rigidity of concrete, and hence does not add that factor of safety.

In conclusion, I would urge upon engineers the necessity of making all parts of a structure strong enough. I can see no reason why engineers are called upon to shave the amount of steel in a building. In all my experiences with architects I must say that I never was required in any way to cut down the amount of steel. Very little is saved by thinning out the metal or by reducing the size of columns in upper stories. Very little is saved by the omission of adequate bracing. If the engineer is not called upon to do this by some exterior influence, he should by all means endeavor to make the structure rigid. I do not mean by this to use steel indiscriminately, but to wisely proportion the structure, and above all things to pay attention to the joints.

Kappa Alpha Fraternity House, Stanford University
Chas. E. Hodges, Architect

Heating, Lighting and Electrical Work

An Improved Application of Hot Air Heating*

By A. O. JONES

AN improved warm-air heating system which has rendered modern furnace work less complicated—an ever increasing number of practical and perfectly working heating plans—make it possible to describe a thoroughly tested and practical heating system; a system insuring the greatest amount of heat from a given quantity of fuel, and one enabling the operator to control the supply of warm air, directing it at will into the rooms to be heated, securing ventilation at a small expense and reducing the cost of installing warm-air furnaces, at the same time increasing their efficiency, is, in the writer's estimation, and in the face of rapidly disappearing prejudices, a system worthy of universal adoption.

The system under consideration differs from those in common use in that ventilation is secured in all rooms and the basement is not filled with warm-air pipes, but consists of the placing of any modern warm-air furnace of the correct size in an ordinary basement of reasonable height. The furnace to be centrally located and supplied with fresh air of an amount equal to at least 90 per cent of the combined area of the basement pipes, and the warm-air chamber connected by one-half the number of warm-air pipes ordinarily used to improved warm-air registers placed in the wall of each room on the first floor, with a wall pipe continuing from the top of each register box to the rooms on the second floor, using for heating each two rooms—one on the first floor and one on the second—a basement pipe with capacity equal to the capacity of two pipes necessary for heating these two rooms separately. The manner of connecting the wall pipe to the top of the improved side wall register is shown in the illustration; also the method of pipe construction in the basement.

The advantages to be gained are that ventilation is secured in all the rooms, as these registers are provided with a double metal box, arranged with an air space between the inner and outer casing, and a ventilating opening, where air is drawn out of the rooms being heated and is conducted through the air space upwards, around the wall pipe—it single wall pipes are used—or through the space between the two casings of a double wall pipe when the latter are used.

The heat of the wall pipe causing an upward current insures a rapid movement of the foul air to a point in the attic directly above the reg-

*Read at the semi-annual meeting of the Heating and Ventilating Engineers on July 20th.

isters, where it should be conducted through vent pipes to a chimney flue not used for any other purpose.

It will be seen that cellar air—as ordinarily used for protection when double wall pipes are used—is not allowed to enter the space between the two casings of the wall pipe, but, instead, air is drawn from the rooms; therefore, coal dust and fine ashes are not found escaping through the registers, as is sometimes the case with the systems that have been in use before the introduction of this system, which has been adopted by a great many furnace dealers who testify to the practicability of the system described.

The advantages of being able to utilize all of the warm air from the furnace in the first floor rooms when the second floor rooms are not in use should not be overlooked, for as is well known—with the old plan of installation—the closing of the second floor registers or the dampers in the pipes leading to the second floor registers, does not increase the amount of air delivered to the first floor rooms, but simply causes the air to be overheated, which is very objectionable—often giving rise to the argument which is advanced regarding vitiated air. While with this improved system the full amount of the air supply is constantly moving, and when the second floor rooms are not in use the fire in the furnace must necessarily be checked and a larger amount of air is supplied at a lower temperature.

When the second floor rooms are in use the increased velocity of the air in the perpendicular or wall pipes makes it possible to heat rooms on the first floor located some distance from the furnace, which is difficult without the assistance of the suction caused by the wall pipe.

The reduced number of warm-air pipes in the basement makes it possible to connect the larger warm-air conductor at a point on the bonnet of the casings where it can run straight to the register. This makes angles unnecessary, excepting in rare cases, and as a straight line is the shortest distance between two given points, the least possible amount of piping is used with very few angles; therefore, the friction and radiation is reduced to a minimum, which means cooler basements and warmer living rooms, to say nothing of the reduction of cost in installation.

The system, therefore, renders modern furnace work less complicated, insures perfectly working warm-air heating plants, securing the greatest possible amount of warm air from a given quantity of fuel, reduces the cost of installing furnaces, and makes failure almost impossible.

* * *

Vigilant Fido

In the barber shop the scissors clicked merrily away, and the barber's dog lay on the floor close beside the chair, looking up intently all the time at the occupant who was having his hair cut.

"Nice dog, that," said the customer.

"He is, sir," said the barber.

"He seems very fond of watching you cut hair."

"It ain't that, sir," explained the barber, smiling. "Sometimes I make a mistake and take a little piece off a customer's ear!"—Ladies' Home Journal.

A Primary School at Palo Alto
Chas. E. Hodges, Architect

Some Stanford University Residences

By CHARLES EDWARD HODGES, Architect*

THE accompanying photographs partially illustrate the residential portion of the Stanford University campus. The houses are built on lots leased from the University at a ground rent of $100 per annum on a lease of ten years, which, by the sanction of the Board of Trustees, can be extended indefinitely.

The minimum cost of residences to fraternities has to be $6000 and to members of the faculty $4000. Two thousand dollars has to be raised, in addition to money borrowed, by all fraternities before any lot can be leased. The fraternity is then incorporated, and an association formed for the disposal of the shares to private individuals willing to loan the money.

The principal features of a Fraternity House are a commodious reception hall, large dining room, library, and combined den and billiard room. All these rooms are so planned as to admit of good dancing space when thrown open, porches which can be enclosed with burlap, can also be made available for dancing. Each house usually contains nine or ten bedrooms on the second floor, eighteen members being about the average number of each sorority. A large chapter room, otherwise known as the "mystery of mysteries," is located either in the basement or attic. Two large bathrooms are sufficient as the "shower" is now most favored. Wainscoted walls are used plentifully, as they have proved a saving on the "wear and tear."

The Freshman at Stanford usually passes his first year in the large Dormitory, otherwise known as Encina Hall, where the old-time initiation of the Bathtub is still indulged in. The second year the Sophomore is considered eligible to be counted as a Fraternity man, and being duly elected, he is initiated with the various stunts usually performed on the public highway for the benefit of his fellow students, so that the student soon learns that sojourn under the red tile roofs is not all hard work.

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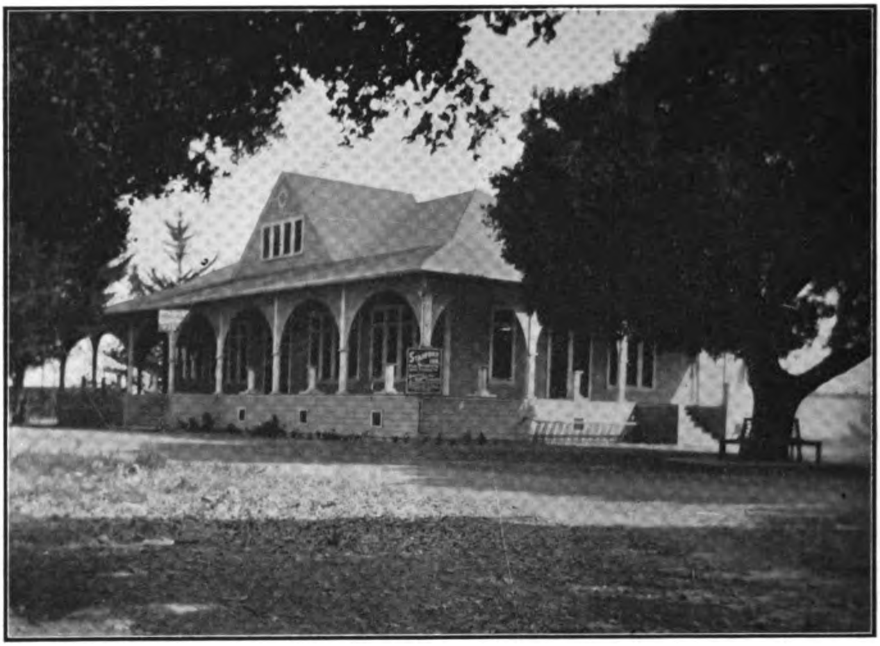
*Mr. Hodges was formerly resident architect at the Leland Stanford University.



University Inn, Stanford
Chas. E. Hodges, Architect

A Professor's Residence, Stanford
Chas. E. Hodges, Architect

Residence of O. W. Dunn, Stanford
Chas. E. Hodges, Architect

Beta Psi Fraternity House, Stanford
Chas. E. Hodges, Architect

Beta Theta Phi Fraternity House, Stanford
Chas. E. Hodges, Architect

Faculty Row was erected for the professors by Senator Stanford in the pioneer days of the University, and as I recall the same it bore a strong resemblance to the refugees' camps in San Francisco. Palo Alto was in its infancy, the depot a freight car, and when reached by a "long road which has no turning," barely furnished the necessities of life. Year by year the Fraternities sprang up in Palo Alto, and finally came over to the Campus, so that now there are only two left where the family tree started.

Residence of Lieutenant J. S. Oyster, Stanford
Chas. E. Hodges, Architect

Terra Cotta and Brick

Structural Terra Cotta as an Exterior Fire Wall

By GEORGE E. WALSH

THE great public value of a tall fireproof building in checking the spread of a fire is being more generally recognized today than ever before, and architects and construction companies are studying more intimately the technical problem of the exposure hazard. The use of structural terra cotta for the exterior finish of tall buildings has enabled architects to secure results in this direction which are worthy of special mention. The employment of terra cotta blocks for protecting the steel framework of the modern tall building requires no description, for the best architects and engineers consider this feature of the work as essential as the foundations and framework, but the use of structural terra cotta for exterior facings has more recently attracted attention.

The modern high office building or skyscraper must have an exterior coating of fireproof material to make it of avail in a great fire to check the onward rush of the flames. Moreover, this fireproof material must be securely anchored to the steel frame to prevent the building from shedding its masonry work during fires. It is the common opinion of engineers that had the San Francisco buildings been constructed of fireproof walls anchored to the steel framework, as commonly done in New York and Chicago, neither the earthquake nor the subsequent fire could have seriously damaged them. They would have acted as great fire barriers to give the fire-fighters a chance to have stopped the conflagration.

The construction of walls offers a more difficult problem the higher they go up. Each extra story increases the weight and taxes the carrying capacity of the steel work. An exterior coating of stone or granite fifteen or twenty stories above the street makes the problem of construction a matter of great technical skill. The great weight of the stone and the necessarily unwieldy size of the blocks makes construction work slow and difficult. Owing to these difficulties structural terra cotta has come into considerable general use in the past few years as a substitute for nearly all other materials.

Terra cotta, either for structural or ornamental purposes, is the lightest building material to be had, and it satisfies all the requirements of the modern office building. It is manufactured in convenient sizes and shapes, so that it can be quickly and easily handled. Time is a great factor in the construction of modern buildings. Any material that can be placed in position in less time than another without affecting the results must eventually prove more popular, for even days and hours count in putting up expensive buildings. Terra cotta for external and interior use can be put up at the rate of a story a day on some buildings, and the money saved by time alone is an important item in the final computation of cost.

A building covered with structural terra cotta is the most fireproof wall that can be placed in the path of a conflagration. It not only protects the building from outside flames, but it virtually saves other structures located to the windward. The light weight of the terra cotta enables the architect to fireproof the upper stories of his structure with comparative ease and inexpensively. In twenty and thirty story skyscrapers the terra cotta has become almost a necessity.

One of the most conspicuous illustrations of the employment of terra cotta for exterior walls is in the new West Street building, designed by Mr. Cass Gilbert. This is a twenty-seven-story structure and is being built on a plot of ground 100 by 200 feet. The entire front and side walls of the building will be constructed of terra cotta. The walls will be of buff terra cotta relieved by ornamental colored terra cotta. This extensive use of terra cotta in a tall building of this character indicates the developments in fireproofing exterior walls to protect them from outside fires.

From the architectural point of view, a building material must possess points of beauty and harmony of coloring, as well as such virtues as strength, durability, lightness and great fire resistance. In too many cases in the past fireproof qualities and durability have been sacrificed for the sake of artistic effects. In the effort to relieve our tall skyscrapers of their ugliness, a few years ago, architects resorted to elaborate ornamentation of stone and metal cornices, but there is a distinct reaction to this tendency to overornament in the best tall buildings of today. Simpler outlines are preferred, and most of the best skyscrapers in New York of recent years show a simple, screen-like treatment, in which monotony is avoided by terra cotta ornaments or plain terra cotta in different colors. This plain treatment in terra cotta, which tends to emphasize the strength and massiveness of the buildings is well illustrated in the new Wanamaker building, published in the Fireproof Magazine of recent date, and in the New York Times building and other similar structures. In the Times building the terra cotta ornament is conspicuous above the eleventh story, but below that the treatment is plain and flat.

The combination of the ornamental with the plain structural terra cotta gives to architects sufficient material to work out lines of beauty equal to that obtained in carved stone. This will be emphasized to an unusual degree in the new West Street building, which promises to be one of the most beautiful, as well as the most thorough, fireproof structures in New York. The terra cotta in buff for the exterior walls will be relieved from any monotony by the extensive employment of finely modeled and colored ornamental terra cotta.

The tendency to use terra cotta more extensively for exterior walls of tall structures is further emphasized in the new Plaza Hotel, which is rapidly going up on the site of the old structure, facing Central Park and Fifth avenue. The three fronts of this structure above the second story will be composed of enameled terra cotta brick and ornamental terra cotta almost marble-like in its finish. Upward of half a million terra cotta bricks will be used in the walls. When completed the structure will present on its three sides fireproof walls which would stop almost any fire sweeping across the city.

The use of terra cotta for exterior trim and ornamental purposes has been more popular than for general outside coating for fire-resisting purposes, but the value of structural terra cotta as a fire-retardent and its unusual lightness is rapidly securing for it a comparatively unique recognition as an essential part of every tall building. In the new Board of Education Hall at Fifty-ninth street and Park avenue the use of ornamental and structural terra cotta has been carried to a happy climax. The walls of the six upper stories are practically rendered fireproof from an outside conflagration by a combination of terra cotta bricks and ornamental terra cotta. No attempt has been made to overornament the upper stories, and the plain, flat treatment gives a perfect finish and a strong, durable effect.

The upper stories of the huge building at 42 Broadway show the effect of structural terra cotta when employed with the double purpose of securing effective details of ornament and a strong fireproof exterior. The six upper stories are finished in terra cotta, forming a fireproof veneer to the front, so that a hot fire could not warp or twist the steel work. The fireproof terra cotta veneer is bolted or anchored to the steel frame, so that there is no danger of the building shedding its coat. Even in the event of an earthquake shock it is doubtful if this terra cotta protection would be loosened from its anchorage.

The triumph of terra cotta for fireproofing is co-extensive with the development and success of the steel frame buildings. Without terra cotta the steel-cage buildings could never have reached their present stage of growth. There is no material light and fire-resisting enough to be used as a substitute for terra cotta for protecting the upper stories of high buildings. The load carried by the steel frame would become so great if reliance was to be had solely upon concrete or other building materials of this character that a building twenty or more stories high would have to be constructed of massive steel columns, girders and beams. The increase in the size and weight of the steel work would seriously involve the practical value and usefulness of really tall buildings.

The improvements in the manufacture of terra cotta blocks for interior fireproofing were made as the direct result of the demands of the day. Had not manufacturers of the hollow blocks brought their products up to the requirements of the builders a twenty and thirty story fireproof structure would be a novelty today instead of a common sight. Realizing the strides made in the manufacture of terra cotta for walls, floors and partitions to suit the needs of modern building conditions, the makers of exterior structural and ornamental terra cotta have within the past half dozen years exerted themselves to achieve like results. Perfect technical processes, and the adaptation of the material to architects' needs, have given a general impetus to the use of terra cotta for a wide class of buildings that were formerly built entirely of bricks and stones. Cheap artificial stones formerly composed the front walls of many of our commercial houses. Inferior terra cotta was also employed at first. But the architects, realizing the value of terra cotta, sought to give it direction and purpose, even before the manufacturers worked out their details of finish and manufacture. No attempt was made to imitate stone in the new designs of terra cotta, but the intrinsic merit of the terra cotta was brought out and emphasized. New colors were secured and new designs and technical methods of applying it to the exterior walls were adopted. The clumsy methods in vogue ten years ago have yielded to better and more economical methods, so that today it is not only the most serviceable and most fireproof building material for walls, but the most economical. When used in place of carved stone it produces equally durable and effective results, and is far more economical.

The blending of harmonious colors and texture of terra cotta for solid faces of walls has added greatly to the use of this building material. The tooling and molding of the surface blocks to produce striking effects have been developed to such an extent that more variety of designs can be given than with bricks. The adaptability of structural and ornamental terra cotta to different building conditions of the day is one of its chief features. For figure ornament and decorative treatment of massive wall surfaces it has no superior, and where the material is not used primarily as a fireproof coating it is often popular for the former.

The better architects are adopting terra cotta building material for their exterior walls more and more, and this is particularly true in the designing of skyscrapers and tall massive walls of commercial structures. The absolutely fireproof character of the material makes it of special importance in this age, when builders and architects are being called upon to construct buildings which will limit the spread of any conflagration. A dozen tall buildings with their exterior walls coated with terra cotta located in the business section of a city would offer more protection to the spread of a fire than half a dozen fire engines. They would prove effective fire barriers, across which the flames could not spread. Had San Francisco's business section been divided into districts by a few blocks of such structures the recent disastrous fire could never have reached its fearful climax.

The use of face-enameled terra cotta for both exterior and interior ornament is another feature of modern architectural development that is of value to one interested in fireproofing matters. The technical methods of manufacturing handsome fireproof, face-enameled terra cotta have greatly improved in recent years, and the result of this is that the architect can give wider scope to his expressions without introducing anything but fireproof material in his designs. Both the Hotel Gotham and the new Wanamaker building in New York have been largely finished off with dull enameled white terra cotta, and in the new College of the City of New York and the New Amsterdam Theater the enameled terra cotta is employed both for interior and exterior effect. The employment of durable colored glazed terra cotta has given new artistic effect to many of our public buildings, and the future of this form of terra cotta must be intimately interwoven with the character and development of our national architecture. Every improvement which tends to increase the fireproof character of our large buildings should be welcomed and the development of terra cotta in its different forms and composition is worthy of all consideration given to it by architects and builders. Even the ornaments of a tall building prove important factors in the situation when a hot fire is raging around it, for falling stones, metal cornices and other materials that are disintegrated and crumbled by fire frequently keep firemen from performing their duty properly. Fireproof ornaments that are anchored to the steel structure so that they become an integral part of the building are not so likely to be dislodged and made dangerous to fire-fighters when a conflagration attacks the outside walls.

* * *

Of course you know a lot of bores, but you would no doubt be surprised to learn that there are people who consider you in the same class.

Cement and Concrete

Cement Block Architecture

By LOUIS H. GIBSON, Architect

IN A paper which I prepared for the convention of the National Association of Cement Users at Milwaukee I said: "I could never have hesitated long in accepting the cement block idea. I have hesitated long, however, in agreeing to accept cement blocks as at present manufactured. I have recognized the inherent merits of concrete construction and from the beginning have felt that making concrete in block form was a worthy building and commercial enterprise; but as one interested in architectural work the actual results of concrete block manufacture have been such that, until recently, I have felt that I could not afford to encourage and foster this industry. I do this now in this way, not because of any decided encouragement through specific results, but on account of what I recognize as a possibility. I know that a worthy cement block can be made commercially."

This statement was made because I recognized the merits of concrete as a building material and because it is desirable to fabricate concrete into block form. I knew that the block machine was a logical former of concrete for building material. I did say, at the Milwaukee convention, that I had never seen an artistically successful structure executed with cement blocks. In this number I am pleased to present a number of pictures of successful structures erected in block form. They are not the ordinary hollow block, turned out on a machine in the ordinary way, but that does not stand for any large material difference. Here are cement blocks, cast of concrete, made with a properly formed aggregate and a proper proportion of cement, properly finished and presenting wonderfully artistic results. Had I seen the pictures of these buildings before the Milwaukee convention, I should not have modified the general sense of my expression, but would have been pleased to illustrate what could be done with cement block. I was pleased to know that Mr. Charles D. Watson's paper followed mine, with illustrations by stereopticon. The cement block is an ideal form of building material, and cement stone can be made on a machine certainly as well and probably better on the average than it can be made monolithically within forms in the ordinary way, and certainly at much less expense.

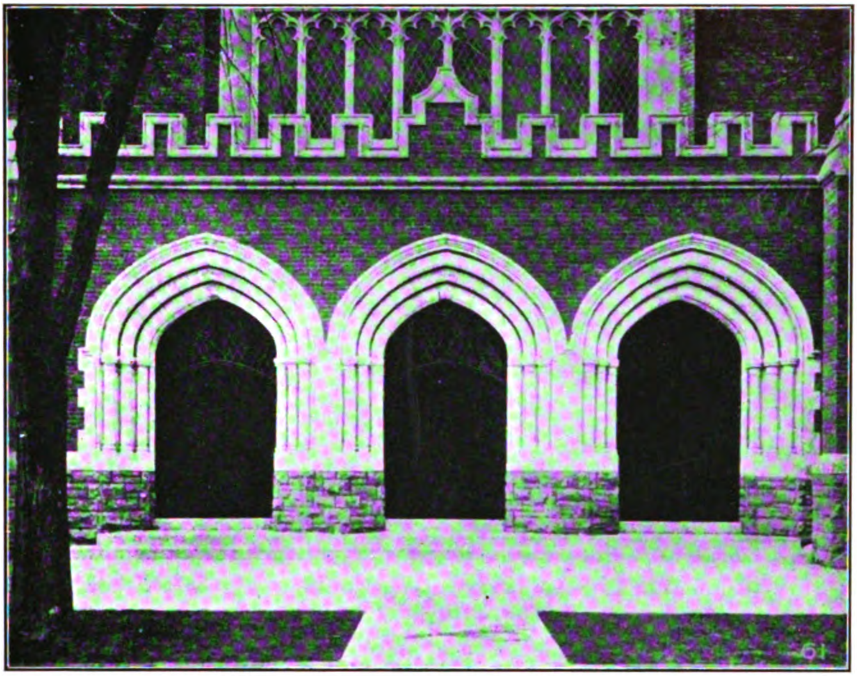
The pictures in connection with this article should serve as a stimulus and inspiration to every man who is in the cement block business. The building of the Canadian Bank of Commerce of London, Ont., is a splendid structure, splendidly conceived and wonderfully well executed. It is built of cement blocks. Every molding, every bit of decoration and the structural parts of this building, as we see them, are of concrete. Here is a splendid example of what may be done. It requires a quality of intent, a quality of mind and a high ideal to develop this kind of material result. Idealization is all right, so far as it goes. It is measurably valuable only in the expressed materialization. In the actual work it has to go from the heart of the artist, through the mind of the builder and the hands of the workman, and every step and detail of the process must carry along the same high quality of intent, sincerity and integrity. This may sound a little highflown to be expressed in connection with so prosaic a subject as an ordinary building operation, or to present to the ordinary, every-day worker, but it is the difference between the prosaic, common, low-down view and the view of the idealist that makes the difference between the ordinary ugly cement block work and the splendid expression which we see in these buildings. People are successful in business and commerce through their ability to render practical their best thoughts and bring them into material form to the people. A high ideal expressed in concrete is a cash asset. This has been done in connection with this work.

The building of the power house at Niagara Falls is a chaste, clean, dignified design, executed in a chaste, clean, dignified manner. The builder has absorbed the spirit of the architect and given it permanent and material form. After seeing this design as here executed, who will ever again question the possibilities of cement block? There need be no doubts or difficulties in the way. One need not say that these are cast stone, or that they are not made on a machine. Machine-made blocks are cast stone, and a high grade of blocks may be made on a machine. That these blocks were cast in sand or in any other way, by hand or by machine, cuts no figure. It is concrete, and the buildings are executed through the medium of blocks.

These pictures present an opportunity of estimating the commercial value of mere design. What is it that causes one bit of dress goods, one piece of furniture, one bit of tapestry, one house, to be far more valuable than another with the same amount of material in it and the same amount of labor expended in making it? It is the design which originated in the brain and heart of the artist. It was the artist who developed the great furniture factories of Grand Rapids. The manufacturer and workmen were but vehicles for the man with the pencil who made the designs for the products. It is the artist who gives value to the raw material.

The church details show a delicacy of conception and of mechanical execution which is not so clearly represented in the other pictures, though it exists in the others, nevertheless. This print shows the fine tracery in the windows, which is of concrete, and the delicate moldings in the doorways. On the other hand, if one were able to look at the larger photographs of the other designs it would be shown that there is the same quality of refinement and sensitive expression running through all of them.

Another valuable lesson in connection with this work comes through the rational consideration of the methods of construction employed. The work of building with cement blocks, stone, brick or terra cotta is essentially a block construction, and in principle there is no relative difference in the actual constructive employment of these materials. It consists of piling one block on another or one block against another,



Central Methodist Church, Toronto. Artificial Stone Trimmings

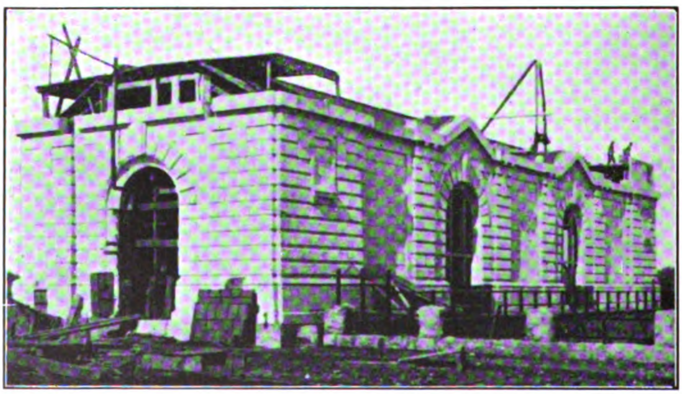
and does not and should not assume to be a monolithic construction. It involves the recognition and exhibition of all joints and does not allow of their concealment. On general principles the system of construction by brick, stone, terra cotta and cement block is essentially the same. The pictures indicate that these designs are an honest expression of structural methods. The joints are a part of the design.

The structural forms which will naturally come out of reinforced concrete construction will be essentially different. Structural concrete methods, as expressed through the use of concrete and steel together, develop a monolithic structure—that is, a building which is practically in one piece. The design becomes a matter of external form and not an absolute expression of method used. Reinforced concrete buildings are built with a mixing machine, the wheelbarrow, the shovel, hoe, tamping tools and trowel, and their proper ornamentation will be developed through the use of molds or such forms as can be fashioned in and made a part of the structural work. Reinforced concrete construction is a casting or pouring process, and not a piling up or building up of block material. This affects the external form of the design, and, should one undertake to imitate block forms by monolithic methods, the result would be disastrous artistically. Try as we will, experiment as often as we please, and the result is all pronouncedly a failure if we consider other than an honest expression. Honesty is the best policy, surely, in art as in the commercial walks of life. Mr. Watson's work is successful because the methods employed are frankly indicated in the structural work.

Anyone who considers the work here pictured as seriously as it

Canadian Bank of Commerce, London, Ontario. Artificial Stone Block Construction

deserves and in its full significance must realize what this demonstration means to the concrete, the cement and the cement-block industry. Who is it that would hesitate in the use of concrete in block form of the character that is herein pictured, in competition with or in substitution for any other building material? Anyone would give it place, certainly, in preference to stone. It has a texture and structure certainly as good, possibly better and more determinable even than the oolitic limestone, than which there is no better natural stone for building purposes in the world. It is structurally fireproof, which stone is not. Certainly it would be esteemed more highly than terra cotta in its design quality. It is certainly more expressive, it has a sharper, cleaner appearance. It is structurally more stable. It certainly has a superior design value to brick. No intelligent or studious observer will hesitate in the selection of this material for any building, no matter what his ideas may be as to artistic or structural value. After seeing this work we need not feel



Gate House of Ontario Power Company. Artificial Stone Block Facing that it is necessary to make any apology for cement blocks as a building material. We may apologize for or feel ashamed of the man who makes the common, ugly, lead-colored, badly conceived block which we see on every hand, but we may now realize that there is no excuse for his existence as a manufacturer. Any intelligent man can do this quality of work if he has the will to do. Work of the kind we have pictured is the expression, not only of artistic, but of commercial integrity. Manufacturers who enter into this cement block work in the same spirit will realize commercial results in dollars and cents.

One who travels and observes must have noticed that the people generally are especially anxious to use cement block and that they are more anxious to use them than are people to manufacture a high-grade block. One would imagine that there had been enough bad work done in the name of cement block to have killed the business. This is not true. It appears to go on apace as though a universally high grade of building material had been presented to the public. The architect in general practice has clients coming to him all the time who insist on using a common unworthy material of the every-day cement block maker. The architect almost has to fight to keep them from being used. With anything approaching the quality of Mr. Watson's work, there is not a self-respecting architect in the country who would be not only willing, but pleased, to use this material. He would know that he could express himself adequately and permanently.

The question of dressing blocks is destined to become a very simple matter. Pneumatically or electrically driven machinery would be readily devised for this purpose as soon as there is a demand for it and as soon as the material of a worthy character for building purposes is generally produced. By this means the cost would be reduced to a minimum. The time is not far distant when people will be willing to pay quite as much for cement block for building purposes as any other structural substance. It depends on the block maker.

* * *

Concrete from a Brick Man's Standpoint

By W. F. BARNES

WITH pleasure I read the article in your recent issue entitled "Terra Cotta and Brick" contributed by the "Clay Worker." This paper seems to have an unprejudiced way of looking at things; although devoted to the clay interests it does not abuse rival materials but concedes fairly that there are merits in all.

I think the men who will put money into new buildings should be treated honestly and not misled by fallacious arguments in the public papers. I do criticise the methods of some of the reinforced-concrete-building advocates. Their essential argument is this and nothing more —"some brick buildings failed in San Francisco; hence a reinforced concrete building will never fail."

Why has not someone already stated the facts of the case? Before the fire every building of importance in San Francisco, save one or two government buildings maybe, was constructed of brick or of brick and steel. Some of them had a facing of stone on the street side, as the St. Francis Hotel or the Kohl building, but they were all essentially brick and steel structures. The victory of these noble buildings over earthquake and fire has been the salvation of San Francisco and they are the pride of the city now.

In reply to this will the advocates of universal concrete buildings give us the names and descriptions of the reinforced concrete buildings in San Francisco that have survived the earthquake and fire? What is the truth of this matter? Were there really any buildings of this type in the city? Where were they, of how many stories, how large, what was the thickness of the walls, who was the architect and who was the builder? Can they not let us visit the buildings or give us photographs showing the "before" and "after"?

How do these people support their claims of the peculiar fitness of reinforced concrete for San Francisco when the material has never been put to the test of actual San Francisco conditions? Their claim is a theory; a great many other theories, plausible before the recent fire, have been discarded since.

The general condition of reinforced floors throughout the city does *not,* to my mind, support the contentions of the reinforced concrete men. I know some floors that have stood well; I know many others that exist as dust in the basements and still others that while maintaining an appearance of strength are really rotten through and through and must be torn down. This is true of concrete column protection in most cases; while it may have saved the steel it is utterly ruined by the fire itself. That is negative praise for a "fireproof" material.

Let us forget for the time all the newspaper talk of the last five months about concrete and, going back to the substance itself, inquire what its right to consideration as a fireproof material really is. For great engineering works, for subaqueous works, for foundations and in a certain class of buildings where there is little conflagration risk, it has incomparable advantages; but is it fireproof and does it not lose its valuable properties at a much lower temperature than would injure common, well-burned red brick?

And why should it not do this? Is Portland cement some new, irreducible mineral, or is it our familiar lime-rock and our familiar clay, crushed, pulverized, mixed and roasted sufficiently to expel the chemically retained water? Could not this roasting or burning proceed until from the lime-rock we have pure lime? Could not the same clay be burnt into an altogether different product? How then, in reason, can the mixing of these two half-burnt materials—either of which would be absolutely destroyed for the purpose in hand by a further application of heat—produce a fireproof material? I am absolutely convinced myself that the best concrete will disintegrate at a comparatively low temperature: I have witnessed the tests and better than that, I have studied the remains of concrete in burned San Francisco.

However, as I said in the beginning, I do not want to make a long article of this, because my purpose is too simple. What I do want is to see the public dealt with honestly in the discussions of this building material question. The business man of the city who is interested in building should be treated to a reason once in a while and not be fed entirely upon opinions.

* * *

People have time to stop and listen to the story of your success, but they are in an awful hurry when you attempt to explain why you failed.—Clay Worker.

Fads and Fallacies in Hot Air Heating

By R. S. THOMPSON

(Continued from the August Architect and Engineer.)

It is a fallacy to suppose that any old pipe of any old size put together in any old way will carry hot air. The force that carries hot air through a pipe is not sufficient to overcome any considerable resistance. Every care should be taken to reduce friction to the lowest point, to avoid eddies and prevent rebound from having the air strike a surface at right angles to its course. When the pipe is long greater size must be given to make up for the lower velocity. Two 45-degree angles are better than one 90 degree elbow, especially if put at a considerable distance apart. In the language of Gladstone, modified to fit the case, it is the province of the heating engineer to make it as easy as possible for the air to pass through the pipes and as difficult as possible for it to refuse to do so.

It is a fad for people in furnace-heated houses to open windows in order to get fresh air. People have an idea that air is not pure unless it is cold, and that unless they can feel a cold draft on the back of their necks they are not getting ventilation. I once overheard a lady remark in church:

"No, I don't think the church is too warm, but there is not a window open, and we shall die for want of air."

And I knew that at that very minute the furnaces were pumping in over three thousand cubic feet a minute of fresh air from out of doors.

These people remind me of the traveler, who, when stopping at a hotel, woke up nearly suffocated, but who slept sweetly till morning after he had broken a window—into a bookcase—in order to get fresh air.

A house heated by hot air needs no ventilation but what the furnace gives it. If the house is too warm, cut down the fire.

It is a fad to talk about furnace heat as a "dry heat." Heat not being a substance is never either wet or dry. Air when heated becomes "drier," that is, its capacity to absorb moisture is increased. But it is the heating of the air that makes it drier and not the method by which it is heated. It makes no difference in this respect whether the air is heated by contact with the iron in a furnace, or the iron in a radiator, or the iron of a stove.

If people want moist air make provision for moistening it, but I always wonder why the wise physicians who talk about the injury to the lungs from the "dry air of furnace-heated houses" send their patients with lung trouble to recover in "the pure, dry air of Colorado and Arizona."

It is a fallacy to suppose that if a furnace heats a house it is necessarily a good furnace, and if it does not it is necessarily a bad furnace. Given two furnaces which can each deliver at the casing top the same number of cubic feet of air per minute, at the same temperature, one may be a good furnace and the other a bad one, but one will heat a house as well as the other. They may differ in fuel consumption, in cleanliness, in ease of management, in durability, and in many other points, but in the ability to heat the house there will be no difference.

A furnace is a machine for the manufacture of hot air. That is all it is made to do and all it can do. The problem of manufacturing this hot air with the least expenditure of fuel, the problem of producing a machine for the manufacture of hot air which shall be cleanly, easy of management and durable are problems for the furnace manufacturer. But the problem of getting this hot air equally distributed through the various rooms of a house, and so properly heating the house, is a problem that rests solely with the heating and ventilating engineer. Given a furnace, good or bad, which can produce the requisite quantity of hot air at the requisite temperature and the proper heating of the house depends *wholly* on the hot-air pipes and ventilating arrangements.

The poorest furnace ever built, if large enough to furnish the requisite quantity of hot air, will heat any house if the engineering work is properly done.

The best furnace ever built will not heat two rooms if the engineering work has not been properly done.

It is the proposition of the man behind the gun.

This accounts for the fact that you will often find two men, using the same make of furnace, one of whom will declare it is the best in the world and the other is equally sure it is the worst. One is giving the furnace credit that belongs to the engineer; the other is placing on it blame which is due to the engineer.

It is a fallacy to suppose that leader pipes in the basement must have an inclination or "pitch" of one inch to the foot in order that the hot air may flow through them.

The ascensional force of hot air (if I may be allowed to coin a word) depends on the difference in elevation between the starting point and point of delivery. It will make no difference whether the air is carried six feet perpendicularly and twelve feet horizontally, or five feet perpendicularly and twelve feet at an inclination of one inch to the foot. What you gain in the pitch you lose in the riser. If I *had* to take my pipes off the side of the casing I would carry the casing up to within a few inches of the joists and carry the pipes horizontally under the joists. I would get the same total elevation by this plan as with a low casing and pipes inclined, but the elevation in the casing would be more efficient than in the pipes, because freer from friction.

But in practice I always use a flat-topped casing and take the pipes off the top, because in this way I can make straight lines from furnace to register boxes and foot-pieces, something it is rarely possible to do where you take pipes from the side of the casing.

By running the leader pipes horizontally and close to the joists you leave plenty of head room in the cellar, if it is of reasonable depth, and they who manage the furnace or use the cellar will rise up and call you blessed.

As in this statement I am flying in the face of all tradition and precedent, I feel that I must back my assertion with a practical example.

Last year in putting in a large job I was compelled, in order to reach a certain room, to carry the air through 88 feet of pipe. Sixty-nine feet of this pipe was horizontal and 19 feet perpendicular. The lay-out was as follows:

I started with a 22-inch pipe, which I carried five feet perpendicularly up from casing top. Then a 22-inch 90-degree elbow. Then five feet horizontally to the right. Then another 22-inch 90-degree elbow. Then 42 feet horizontally through a long hallway and out into a "Social Room." Here the 22-inch line ended and the pipe was capped. A few feet before the end I tapped this line with a 9-inch round pipe which heated two rooms in the second story and a 3½ by 12-inch pipe which heated one room on first floor. Close to the end of the 22-inch line I put in a 16-inch tee collar for a 16 by 20-inch register on first floor. In the cap on end of the 22-inch pipe I put a 9-inch collar; on this a 9-inch 90-degree elbow, with six feet of 9-inch pipe running horizontally to the left, where by a reducer and 8-inch round elbow I entered a perpendicular 8-inch round stack twelve feet high. This entered the bottom of an 8 by 10-inch square pipe, which ran sixteen feet to the right horizontally between the joints. The end of this pipe was closed, and I cut into the top a 3½ by 14-inch pipe with a 12x15-inch register just above the baseboard.

The long run of 22-inch pipe being all exposed was leveled with a spirit level. You will notice that in addition to the sixty-nine feet of absolutely horizontal pipe I had six 90-degree elbows, not counting the change in direction of air made as it came through the register.

You will notice also that the 16 by 20-inch first floor register was at the end of a 47-foot line of absolutely horizontal pipe.

In laying out this job I made the following calculations:

1. That the 5-foot rise from the top of the furnace would give sufficient force to carry the air to the end of the 22-inch horizontal line.

2. That as the capacity of the 22-inch line was considerably in excess of that of the three tappings, that the momentum of the air would, when it struck the closed end, drive a considerable amount around the 9-inch elbow, and through the 9-inch horizontal pipe, on the principle of the hydraulic ram.

3. That the 8-inch perpendicular pipe would take care of itself and give the air a good push to start it through the sixteen feet of 8 and 10-inch horizontal pipe.

4. That by giving this 8 by 10-inch horizontal pipe a capacity 60 per cent greater than that of the riser by which it was fed I would make up for the loss of velocity.

All the five registers on this system worked well, and equally well, and none better than the one at the end of 88 feet of pipe.

In my own justification I must say that I did not in this case send the air around Robin Hood's barn and back again simply to give it exercise, but because in this case the line followed was the most direct which the construction of the building permitted.

I could give plenty of other instances, and in fact every job I put in is an instance.

I freely admit that if by the use of "pitch" angles can be *materially* reduced or distances *materially* shortened there is an advantage, but claim it is due to reduction of angles and distance, and that this will rarely justify spoiling the head room in a basement.

But my time and your patience would fail should I attempt to give all the fads and fallacies which in my opinion have been connected with hot-air heating. The business has been far too largely left to unscientific men. Every man who has ever lived in a furnace-heated house thinks he knows all about heating with hot air. Every man who can handle a hammer and a pair of snips thinks he is competent to put in a furnace. The popular impression has been that science and skill were not needed, and if the house were not heated it was the fault of the furnace or the system.

* * *

How much common weal is sacrificed upon the altar of selfish individualism.

* * *

It is too often found more convenient to quote a maxim than to practice a principle.

* * *

Experience proves that those who gain money rapidly by speculation almost never keep it; and when they have lost it they are infinitely worse off than they were before.—Success Magazine.

Greater San Francisco Construction Association

THE Greater San Francisco Construction Association, composed of prominent engineers, architects, contractors, material men and property owners, has organized permanently to counteract the labor troubles which seriously threaten to retard the reconstruction of San Francisco, and adopted the following resolution:

"That whereas, We believe the permanent reconstruction of our city is being seriously, if not fatally, retarded by continuous labor demands which have threatened to further force the labor cost in construction beyond fair and reasonable limits and surround the building industry with working conditions which tend to produce continual increasing industrial instability, and whereas, these conditions are largely maintained by restricted labor supply; and whereas, the city's greatest industrial need is a large amount of labor of a character that will replenish its depleted citizenship and give force to the work of rebuilding our ruins, be it

"Resolved, That this Association declares that it will exert every influence it possesses, and will co-operate with every other organization that displays a willingness to do so to invite, secure and guarantee permanent employment and protection with fair wages and hours to all competent labor that can by organized force be invited to come to this city."

The officers are: W. J. Wayte, President; Max Goldsmith, First Vice-president; W. W. Thurston, Second Vice-president; Richard Jones, Secretary; D. Franklin Oliver, Treasurer.

Relative to the sentiment that the building trades are demanding too high wages it may be said to the credit of the Associated Council of Carpenters that they have on two separate occasions voted down a proposition to increase the carpenters' minimum wage above $4.00 a day for eight hours. The demand for workmen, however, has brought the actual wages paid to $4.50 a day for first class men, and a few are receiving as high as $5.00 per day, the latter wage being paid to the best men and as a temporary bonus by contractors who have interior bank fixtures and other similar work to execute.

It is reported that there are hundreds of workmen engaged with non-union men under open-shop conditions, the unions, realizing that if they are unable to provide enough men they cannot, in fairness to the contractors, exclude others from employment. The union wages for bricklayers is $6.00 a day, but shortly after the fire in April wages went up to $7.00 a day. Plumbers have been granted an increase of $1.00 a day, making their wages now $6.00.

According to estimates made September 1st there were at that time 35,000 men employed in building operations in San Francisco as against 13,350 on January 1, 1906.

* * *

Propitious

An English daily had the following advertisement: "Wanted—A gentleman to undertake the sale of a patent medicine. The advertiser guarantees it will be profitable to the undertaker."—Christian Register.

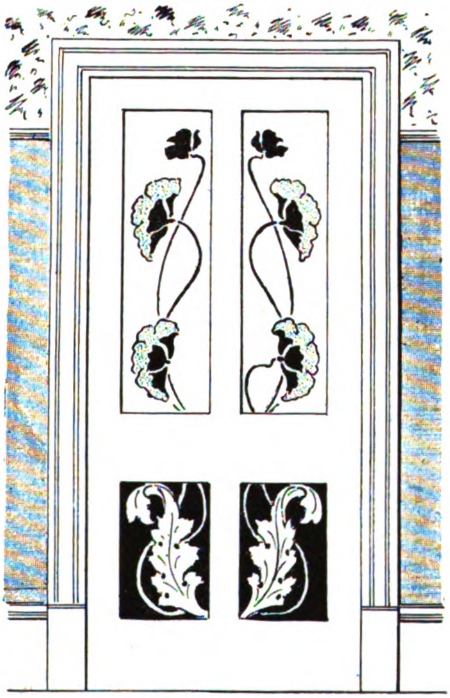
* * *

Some people seem to think that they can purchase friends just the same as they do groceries and drugs.

Novel Idea in Interior Decoration

By SIDNEY PHILLIPS

THERE is one part of the wall space of almost every room that is neglected by the decorator, and often cuts into an agreeable decorative scheme with a rectangular piece of bald panel work entirely out of harmony with the general effect. That is the door. Open or shut it obtrudes itself on the vision as a space filled with painted or varnished woodwork, deriving some little interest from the arrangement of the paneling—though in the case of the usual four panel door this interest must be very slight and relieved only by the slight shadows cast by shallow moldings, or perhaps by the grain of the wood, if it is finished in the natural. And if, as it frequently happens, there are several doors in the room, a large portion of the wall space is entirely uninteresting from the decorative standpoint. Some of the early Gothic doors were made attractive by the great wrought iron hinges, elaborately designed and exhibiting the cunning work of the smith, that served to bind the door together, as well as to hang it. Again, many front and vestibule doors are made with glazed upper panels, affording opportunity for bright colors and effective design. The value of these glazed doors as an attractive adjunct to a house has long been recognized by speculative builders. But there is no reason whatever why decorations upon doors should be confined to leaded glass.



The panels of the door afford an opportunity for decoration, either with stenciled, painted or burned-in designs, or combinations of one or more of these methods. And it may be well to add that whatever decorative scheme is employed for a door, should be confined, as a rule, to the panels, since the stiles and rails are the elements of strength which bind the panels together and support them, and hence should be free from decoration. If any ornament is to be used upon the framework it should be a simple geometrical treatment that would not take away from the structural character of the door. Besides the methods of decoration above suggested, there are, of course, others that are available, such as inlay, applied metal work or relief ornaments, or tapestry, or even wall paper can be used.

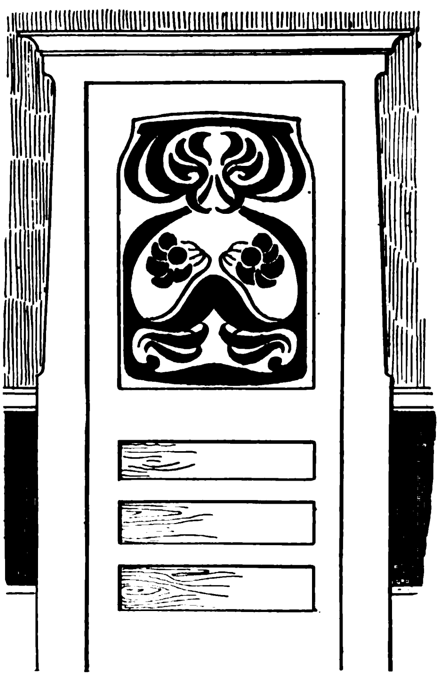
In the latter case, the hard prints, many of which are very beautiful, and the imitation leathers, some of which are close imitations of old Spanish tooled leather, would be very appropriate for a door panel decoration. The imitation leathers, such as are used for furniture coverings might also be used.

When fabrics or wall papers are used for decorating a door, the moldings should be first removed and the fabric stretched in position and tacked closely around the edges with small tacks, and the moldings should then be replaced, covering the rough edges.

In order to protect ordinary wall paper from being soiled by handling, it may be varnished after it has been pasted on the door panel. This is done by first sizing the paper with a glue size, prepared by boiling the best glue (gelatine in flakes) in sufficient water to make a size that can be applied smoothly and evenly, and after this has stood for at least twenty-four hours, applying a thin coat of white damar varnish. A second thin coat of varnish can be given if desired, but, as a rule, one coat will be sufficient.

Painted or stenciled decorations look well either on painted woodwork or on wood that is finished in the natural or is stained. In the latter case the decoration should be done after the work is filled and given a thin coat of shellac, which should be lightly rubbed with fine steel wool to bring it to a smooth even surface. In coloring the design, the effect of the varnish should be considered. An ordinary varnish gives a brown or yellow cast to the colors beneath it, changing blues to a greenish cast and considerably dulling the reds, greens and yellows. Where bright colors are desired to carry out the decorative scheme, care should be taken to use only such varnishes as are specially prepared for use with white enamel work. These are made from selected gum and are nearly colorless.

For pyrography or burnt wood effects which are particularly adapted to panel decoration, selected poplar or white wood is the best lumber to use, although straight grained oak (not quarter sawed) that is fine and uniform in grain, or cherry, may be used if desired. Maple is also well adapted for burning. In this case the burning should be done before the wood is filled.



For the purpose of illustration, two designs for decorated doors are given. In each case the Art Nouveau style has been used, since it is capable of so much variation and freedom of treatment. Of course, the Empire torch, the Colonial swag or garland, or the heavy laurel leaf festoon, as well as almost any decorative style can be employed.

The first door illustrated is an ordinary four-panel door, the design being a conventionalized poppy. On the bottom panels are large leaves with twisted stems that run on up to the upper panels, as though passing back of the lock rail, each supporting a large flower.

The leaves are of dull green, against a black or dark brown or blue ground. The flowers are bright red, or dull yellow against the natural color of the wood, the stems being green. The background of the lower panels may be darkened by burning.

But it is when the door is designed with a special view to decoration that the most novel effects and the best results can be obtained.

The second design is an odd one, the decoration being suited for painting rather than for burning. The color should be pale blue or green, or at any rate, should be light in tone. The flowers should be red or yellow. This design would look well in pink or pale green on a white or ivory enamel finish door.

The illustrations are intended merely to suggest some ideas of the possibility of painted decorations for doors. Many others should suggest themselves to the wide-awake decorator.—American Carpenter and Builder.

* * *

Wall Paper For Gloomy Rooms

WHEN choosing paper for the walls of bedrooms and sitting-rooms, it is well to remember there is another consideration than artistic design and harmonizing color.

A scientist tells us, says an exchange, that in these "nervy" days the color of one's surroundings is not a mere esthetic consideration. This is not as far-fetched as it may appear. When there is blue sky above, who is not happier and more cheerful than when mist and fog obscure the light of the sun? If we love the outside world beautiful, it is quite reasonable to make our homes so.

Here are some rules by which to go. The most restful wall paper is of one tint, without any pattern; this is good for nervous people. Have you ever, when ill in bed, reduced yourself to a state of nervous irritation by trying to join a big sunflower, or something, to its stalk which has wandered away in the pattern? Red is supposed to be rather bad for nerves, but is warm and cosy, especially if patternless. Dark browns and drabs depress sensitive folk, while a rich, clear brown is said to be quieting and soothing. Green is splendid for the eyes, and ought to be in writing-rooms and libraries. Clear, but not too vivid, yellow, we are told, produces exhilaration and self-confidence.

* * *

Portland Architectural Club

By C. H. KABLE

THE majority of the larger cities throughout our country support very active and influential clubs, the records of which show a constant gain in membership and professional standing. All have proved a great benefit to all members and to the community in general. It was a club of a similar nature which the five architects and draughtsmen had in view when they met to discuss the possibilities of an organization at a meeting last May. These five men were quite enthusiastic, and got others interested, so that, at its third meeting, held May 28, 1906, the following officers were elected to hold office for the ensuing year: E. B. MacNaughton, President; John G. Wilson, Vice-president; C. H. Kable, Secretary; H. A. Whitney, Treasurer.

During the organization of this club, all were interested in the work of other architectural clubs of similar nature, and especial interest was given the San Francisco Architectural Club on account of its nearness to us, also its good success since its organization a few years ago.

Among the Architects

State Board of Architecture

President .... HENRY A. SCHULZE
Secretary-Treasurer .... LIONEL DEAN
Asst. Sec.-Treas .... FRED H. ROEHRIG

Northern District

HENRY A. SCHULZE, LIONEL DEAN, SETH BABSON, WILLIAM CURLETT, CLINTON DAY.

Southern District

JOHN P. KREMPEL, FRED H. ROEHRIG, OCTAVIUS MORGAN, SUMNER P. HUNT, W. S. HIBBARD.

San Francisco Chapter of American Institute of Architects

President .... HENRY A. SCHULZE
Sec.-Treas .... WILLIAM CURLETT
Vice-Pres .... WILLIAM MOOSER
Trustees .... JAS. W. REED and CLINTON DAY

Regular meetings, the second Friday in January, April, July and October.

Bank of Italy Building

Much interest has been manifested by San Francisco architects in the competition for plans for a modern fire-proof bank building for the Bank of Italy. Several of the leading architects in the city prepared sketches and some of the best plans ever brought out in a local competition was the result. The final selection was made by the bank directors from four names selected out of a dozen or more by a committee of three. The successful one was Architect Frank T. Shea, brother of City Architect Shea. Mr. Shea's plans, according to the bank officials, were elaborately executed, and were accompanied by estimates of actual cost which gave the bank people something tangible to work upon. The plans as accepted call for a ten-story building, having a granite base with a pink rose pressed brick front for six and one-half stories, the remaining three and one-half stories being of terra cotta. The floors will be of reinforced concrete as will the foundations. The windows and doors will have metal sash and frames. There will be two high speed passenger elevators and one freight elevator. The ground floor will be elaborately finished for banking purposes. The estimated cost of the building, which will occupy a commanding site at Clay and Montgomery streets, is $200,000.

The following architects and designers participated in the competition: Sutton & Weeks, Loring P. Rixford, William Curlett, Mooser & Milwain, Ralph W. Hart, Frank T. Shea, L. Mastropasqua, Italo Zanolini, John C. Pelton, C. R. Wilson, Charles Paff & Co., Stone & Smith and Gordon, Tracy & Swartout of New York.

Cuthbertson's Suggestions

Architect W. J. Cuthbertson of 1231 O'Farrell street, formerly city architect, has filed a communication with the Board of Supervisors setting forth his idea of how fires in the city might be checked. His suggestion is that the front space of all lots fronting on business streets shall be utilized for one-story fire proof structures to be devoted to business purposes, and upon the roofs of which shall be constructed sidewalks for foot passengers, the higher structures on the lots to rise back of these walks. In front of the fire proof structures on the street level he would cut narrower sidewalks, covered by arcades supporting street car tracks, one on each side of the street.

Gets Three Good Contracts

The Thompson-Starrett Company has taken the contract for the erection of an eight-story building on the southwest corner of Kearny street and Union Square avenue, for the Luning estate. The building will be class A and will cost $250,000. Nathaniel Blaisdell is the architect. The Thompson-Starrett Company has also been awarded the contract for reconstructing the Sherman & Clay building at Kearny and Sutter streets at an outlay of $175,000, and the erection of the Hotel Alexander on Geary street.

New Partnership

Charles Edward Hodges, the architect of various buildings at Palo Alto University, and Kenneth McDonald, Jr., recently from the office of Hunt & Hunt, in New York city, have become associated in business at 871 Eddy street.

Senator Perkins' Building

Plans for Senator George C. Perkins' new building on the southeasterly corner of Kearny and Bush streets have been completed by M. J. Lyon, the architect, and figures are now being taken on the handsome $100,000 structure which will be begun within thirty days. The building will be an exact duplicate of the former building, erected on the same ground, is designed by the same architect, and, as formerly, will be strictly Class A. The Senator has determined also to maintain its name, the Alto building. It will consist of eight stories and basement.

Bids for Claremont Hotel

Architect C. W. Dickey, with offices in the Macdonough building, Oakland, announces that he is ready to take bids for the heating, plumbing and electrical work in the new Claremont hotel at Berkeley. The building is now under way and is to cost $500,000. An elaborate heating and ventilating plant is to be installed as well as a private fire sprinkler system.

Will be Handsome Structure

One of the handsomest office buildings in the city will be the new Dana building, which will face Union square on the site of the old structure, the ground floor of which was occupied by the Peacock restaurant. Oliver & Foulkes are busy on the plans which call for a twelve-story building of steel, reinforced concrete and metal. The structure will cost $350,000 and the architects will be ready to receive bids in two or three weeks.

New Library Building

The trustees of the San Francisco Public Library, James D. Phelan, chairman, will shortly call for competitive plans for a library building to cost upwards of $1,000,000. It is planned to make the structure one of the most beautiful and imposing public buildings in San Francisco. Andrew Carnegie has donated $750,000 towards the new structure.

Odd Fellows' Building

Oakland is to be the home of the state officers of the Odd Fellows' lodge of California and plans have just been finished by Architect Samuel B. Zimmer of the Bacon Block, Oakland, for a $250,000 building of handsome French renaissance design. The structure will be nine stories high and will be constructed of concrete, stone and terra cotta. The committee has under consideration some added details to the plans, including marble pillars to extend from the first to the third floors. This would entail an extra expense of about $30,000.

The building company is capitalized for $100,000. The company has purchased the northeast corner of Nineteenth and Grove streets, the lot being 90x131 feet. The directors of the company are Jesse A. Jackson, president of the Phoenix Planing Mills; George W. Schmidt, B. F. Edwards, Thomas Gilbert, John E. Henderson, F. J. Wentworth, W. F. Woods.

Brick and Terra Cotta

Granite, gray brick and terra cotta will be used in the exterior construction of a ten-story brick building to be erected by the International Savings Bank in Los Angeles from plans by Architect H. Alban Reeves. The plans call for footings and cantilevers of reinforced concrete to support a riveted steel frame. Contracts for the brick and stone work will be let in a few days. The building will have a basement and sub-basement and will occupy the corner at Spring, Temple and New High streets.

Reinforced Brick for Whittell Building

Architect Frank Shea is at work on plans for a $250,000 hotel to be called the Langham. It will be eight stories and one of the finest equipped hostelries on the coast.

It has been decided to use brick instead of metal sheets on the Whittell building, the steel frame of which is finished. The brick will be wired so that it will stay in position in case of a severe shock or strain. Work on this skyscraper is to be rushed without further delay.

Los Angeles Architectural Club

The Los Angeles Architectural Club has been recently organized and at a meeting held in rooms on the second floor of the Tajo building, which the club will now occupy permanently, officers were elected as follows: President, H. F. Whitney; Vice-president, E. R. Jeffery; Secretary, A. R. Walker; Treasurer, P. J. Van Tress; Chairman of the House Committee, Walter Erkes; Chairman of the Library Committee, Albert Crowder; Chairman of the Auditing Committee, George H. Brown.

Buys Lot for Hotel

J. A. Marshall has just purchased the Seneca Gale property on the corner of Bancroft and Telegraph avenues, Berkeley, for $17,500, on which he will erect a four-story hostelry. C. M. Cook of Oakland is the architect. The building will contain 150 rooms.

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ARCHITECTS MUST HAVE LICENSE

The State Board of Architecture is doing the right thing in bringing to task practicing members of the profession who have neglected or failed to secure the necessary State license. It has been known to the Board for some time that a large number of Easterners were practicing in San Francisco without the required permit, but it has been an extremely difficult task to secure evidence against the offenders that would insure conviction in court. Some who would evade prosecution have been practicing as "architectural draftsmen" or "architectural engineers." The penalty for practicing as an architect in this State without a license is $500 fine and one year's imprisonment, and the court can inflict both. Registered architects are glad to see the move of the State Board, as it is no more than right that those who pay into the State coffers a license fee should be protected while the fellow who would evade payment should have meted out to him the full penalty of the law.

* * *

DEPARTMENT OF ARCHITECTURE

Today on this Coast the demand for competent architectural assistance has never been equaled. Architects are seeking those who are properly qualified, and the increased remuneration offered has led many young men to inquire how they may prepare to advance in this field of work.

But few persons comparatively, outside of the students themselves, are aware of the advantages offered by the Department of Architecture of the University of California at Berkeley, and a word of explanation may not be amiss.

The Architectural building is located in one of those pleasant wooded spots in the University grounds overlooking the Golden Gate, and here a little group of earnest workers is taking its first steps in this great avenue of human endeavor, in the spirit, as well as in the letter—in all that the word "architecture" means—in charge of one eminently fitted for the position, both by nature, education and experience, aided by thoroughly competent assistants. Here are being formed ideals and conceptions which will be visibly impressed upon the greater San Francisco of tomorrow.

Space will not permit of a detailed description of the courses of instruction given, which include theory and history of architecture, architectural design, water color, modeling, pen and ink rendering, graphostatics, stereotomy, freehand drawing, perspective, etc.

The State has liberally supplied, and private generosity has assisted in providing, these advantages for all those prepared to receive them. Special students are permitted, under the regulations of the University, who show conscientious efforts to advance in these branches, and the writer will vouch for the fact that no ambitious aspirant will regret the time he may devote here. The days are far too short, and many a late passer-by sees the lights still burning, while with unabated enthusiasm this little band works on in the night.

Probably the finest library of architecture in the State is at the command of each student, who is encouraged to take deep draughts at the fountain which metaphorically is filled to overflowing with treasures of the rarest architectural value.

The problems given the advanced classes are in line with those of the Ecole des Beaux-Arts, at Paris.

A society of architectural students of the University has been formed, and it is the intention to hold an exhibition in December to be participated in by all students and graduates, when an opportunity will be given to all who desire to observe the high standard of work required by the University.

WILLIAM A. NEWMAN.

WHAT CONSTITUTES A FIRE-PROOF BUILDING

We hear much nowadays as to what really constitutes a strictly fire-proof building. A great deal has been written in favor of this and that material but we have failed to observe any article that has presented a practical instance of the complete effectiveness of perfect fire proofing. The building that has been destroyed has always been a building with something lacking to make it immune from fire. How are we going to know when we get a perfect fire-proof structure? It will take a mighty warm fire to give it the proper test.

While in some particulars we do not agree with F. W. Fitzpatrick, the Washington architect who writes quite logically on fire-proofing—Mr. Fitzpatrick is not a reinforced concrete enthusiast—he believes in its use only in a modified form—still we think he has gotten together some excellent ideas of what a perfect fire-proof building should be and the substance of his conclusions are reprinted herewith. He admits that even in San Francisco there have been features enough about the several structures that, if assembled in one building would have made that an ideal building.

"Let the foundation," says Mr. Fitzpatrick, "be sufficient in extent and on good bottom, or carried down to good bottom by concrete piers or reinforced concrete piles. Build a framework of steel; let the factor of safety be a most liberal one. Don't try to save rivets; use gusset plates at connections; wind-brace your frame thoroughly; tie it laterally, and where possible, cross-tie your verticals. Paint your steel if you wish, but certainly be sure and cover it all, bed it thoroughly in cement. Then protect it in every part.

"Fill in the voids of your columns with brick or concrete or tile and incase the whole in four-inch blocks or fire-proof tile, the parts of which are at least one inch thick. Bond this tile together and tie it into the column and to the frame; make it a homogeneous mass; do the work as were fire-proofed the Chicago post-office columns and no earthquake nor fire will ever affect your vertical supports.

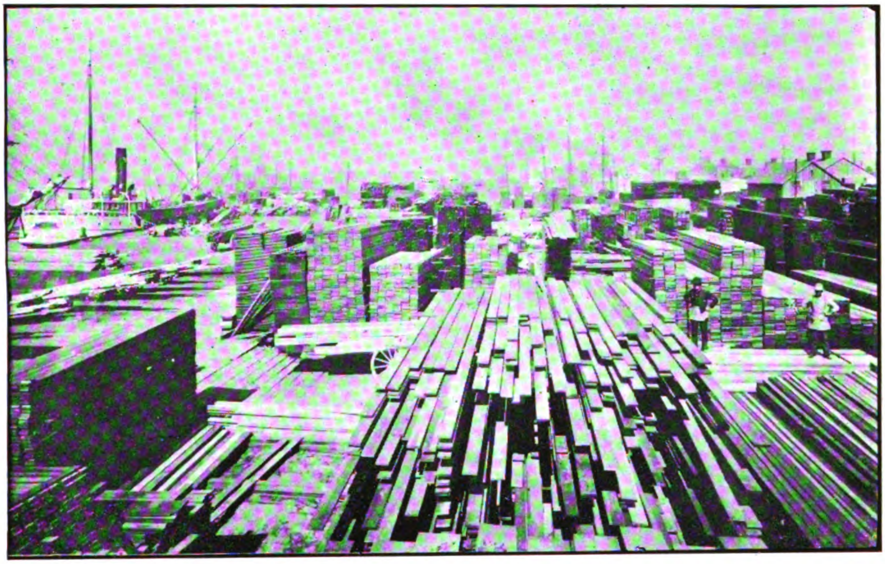
"Make your floor construction of narrow span and rigidly tie your frame; stiff angles are preferable to tie-rods and floor spans of seven feet and eight feet between twenty-foot long beams, without tie-rods or brace, in an earthquake region, should never again be used. Fill your floor spans with deep, flat arches of porous tile, the deeper the better; or, if great weight is no disadvantage, then use deep arches of concrete, but let there be a tile protecting ceiling surface to the latter, or well below the arches a suspended ceiling of metal lath and plaster. In every case have the soffits and projecting members of your floor frame covered with fire-proof tile of two thicknesses.

"Build your outer walls from story to story of brick or concrete, but face it internally with hollow brick and externally with a good quality of well-burned brick. Where ornament is desired use well made terra cotta. Don't be afraid of the *quantity* of the material; it is only the thin, sharp angles and uneven, poorly baked surfaces that scabble off in a fire. With an even thickness in ornament and plain, plenty of ribs, and properly burned, terra cotta will stand any fire you expose it to. The use of granite, stone and marble, wherever fire can get at them, will hardly be looked upon with much favor by San Franciscans. Use good cement mortar in your walls. Tie them and bond them thoroughl y and make them close kin to the frame, not mere distant relatives. Don't be afraid of using plenty of steel in your terra cotta cornices, tie them in, anchor them and make them part of your building, not merely an easily dislodged, removable lid.

"Use wire glass and metal or asbestos frame wherever your windows expose your building to external fire —and remember that in San Francisco buildings ignited that were a hundred feet from the source of fire. Where there is much danger from narrow alleys and adjacent buildings use *double* wire glass; don't put a wooden roof on an otherwise good building; make that roof as invulnerable as any floor. And if there are taller buildings than yours alongside of you, make it stiff and strong enough to withstand the shock of falling walls. Build your partitions of at least four-inch hollow porous tile, not on top of a finished wood floor nor on the concrete filling and wood strips, as was done in San Francisco and alas, so many other places, but on the solid bearing of steel and floor construction.

"Use good mortar with your tile; bond and lap the surface with metal fabric and clinch it with a good wall plaster. Don't, in Heaven's name, insert wood jambs and lintels for the finish; use metal members. The efficacy of metal trim has been amply demonstrated there and elsewhere. What is the use of filling your building with tinder? Metal or asbestos cement doors and trim are not prohibitive in cost, they are cheap at any price, and their advantages are manifold. Cut up the interior of the building into units that make a fire in their contents easy to handle and confined to small space. Make each story a unit by absolutely closing off elevator and stair wells, accessible only through self-closing fire-proof doors in either solid partitions or wire glass inclosures. Carry out the idea of small units by making, in an office building, each office independent by means of wire glass in the corridor divisions. Provide tanks or other sources of local water supply that will be of incalculable benefit to you or your neighbors in case of accident to the municipal supply. Accustom your employes to using judgment, coolness and skill in dealing with an incipient blaze that may occur in any one room or in fighting fires in adjacent buildings."

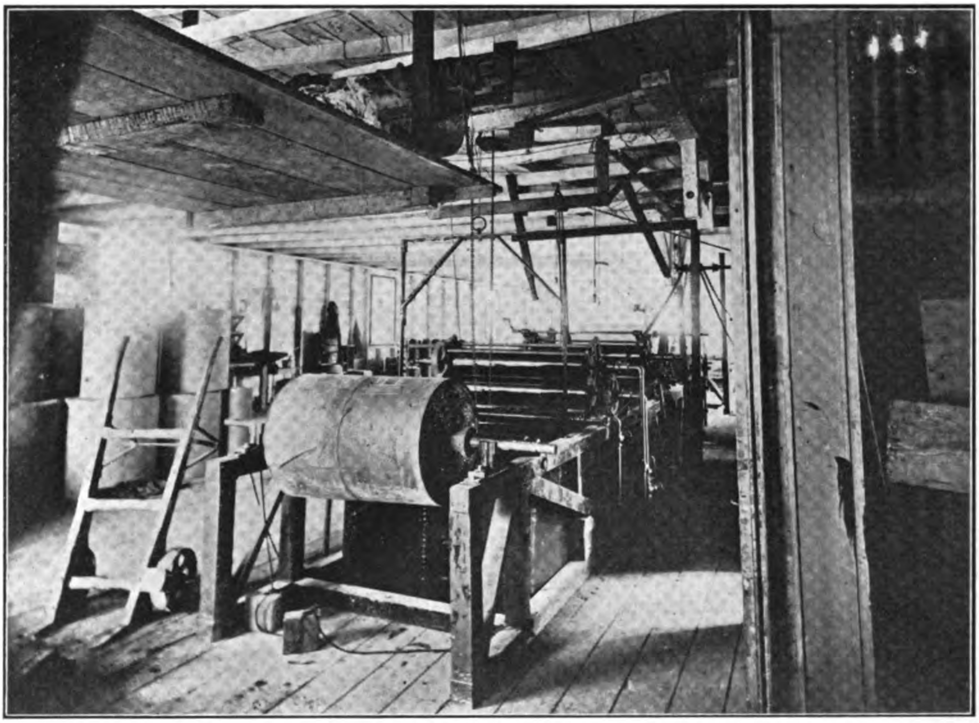
The Publisher's Corner



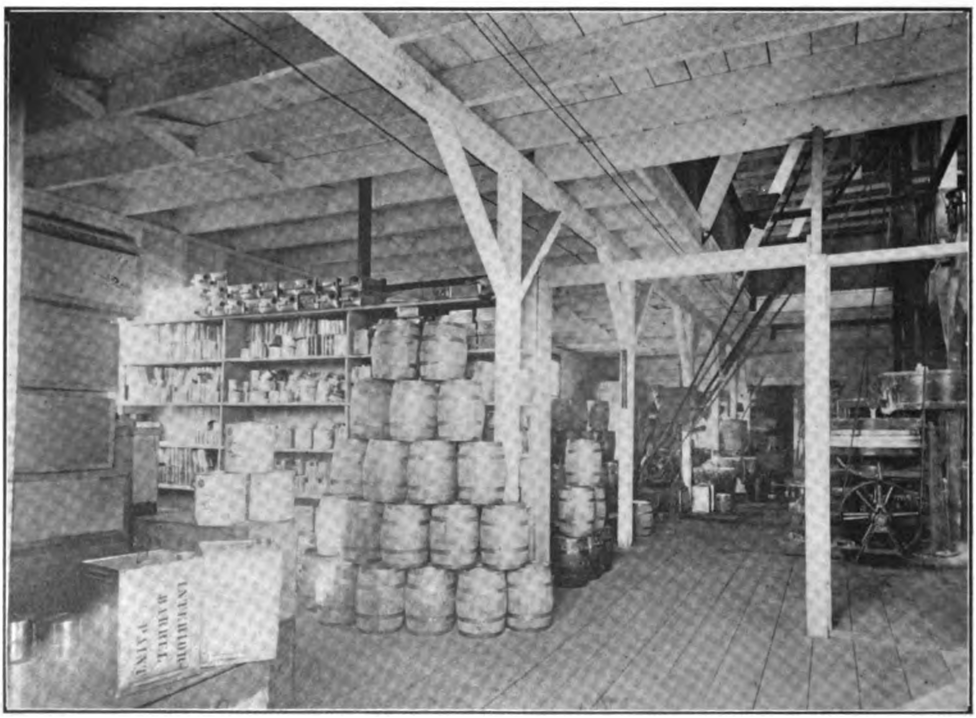
Unloading a Lumber Schooner at Oakland

The illustration shows one of the big lumber schooners which ply between San Francisco and the Washington coast, unloading at the great wharf of the Sunset Lumber Company in Oakland. This company has one of the most extensive lumber yards on the coast and its superior water front facilities enable it to keep the yard well stocked with redwood and pine, although the demand for lumber since the earthquake has exceeded all previous records.

Three boats are unloaded every week at the Sunset Company's wharf alone, which gives one some idea of the vast quantities of timber used in new construction work in the cities across the bay.



One of the Flexo Machines



Lead Grinding Room

Flexo—A Fire-Proof Roofing Paper

The Flexo Building Paper Company succeeds the Continental Paint and Varnish Company of 918 to 924 East Twelfth street, Oakland, and has moved into its new offices which have been handsomely fitted up. W. J. Piatt, well known as the President of the Bayside Manufacturing Company, is President of the new enterprise which should be sufficient guarantee for the success of the Flexo Company. Mr. Piatt has made the Bayside Company one of the strongest enterprises of the kind on the coast and the secret of his success is enterprise. Mr. Piatt never lets the grass grow beneath his feet. He works early and late and employs a staff of assistants who are known by the trade as hustlers. Although the Bayside Company is little more than a year old it has a run of ten mills of grinding lead, oil colors and mixed paints, which means the second largest plant of the kind on the coast. Business has trebled since the earthquake and in a few days the stockholders are to receive a surprise in the shape of a handsome dividend. The Flexo Building Paper Company will be given the same attention that brought success for the Bayside Company. J. W. Zollars, Vice-president, has been East, where he purchased machinery and a large stock of goods to complete the company's plant. Flexo building paper is for roofs and among its commendable qualities is extreme durability, as the name implies. It is said to be one of the best fire-proof roofs yet placed on the market. Fires can be built on any roof covered with Flexo Building paper without the slightest danger of burning any part of the covering. The company has machines for turning out its own patent processes so that it may be truthfully called "home industry," no part of the paper being made outside the State.

New Hardwall Plaster Company

The Pacific-Plymouth Plaster Company is a new San Francisco enterprise, organized since the fire. The company has the exclusive handling of the famous Plymouth Rock hard-wall plaster. Its office and salesroom are at 1083 Howard street, near the postoffice. The following announcement is made by the company:

"To the Trade—We are carrying a full stock of hard-wall cement plaster, stucco, plaster paris, wood fibre plaster, together with especially prepared goods for expanded metal, wire, lath, brick and stone work, and will have constantly on hand the highest grade goods in these lines ever placed on this market—and the price is right, too.

"We are handling the product of the Plymouth Gypsum Company of Fort Dodge, Iowa, admittedly the **best** hard wall plaster in the United States, if not in the world.

"Ours is a gypsum plaster running 99.2 per cent pure, according to government report, and is as much superior to ordinary lime plaster as steel is superior to cast iron.

"Hard-wall plaster has practically displaced lime plaster in the Eastern markets, owing to its superior qualities.

"The recent earthquake has fully demonstrated the difference between the two, as the lime plaster almost invariably came off either wholly or in part, while the hard-wall plaster almost without exception remained intact.

"We would call especial attention to our celebrated wood fibre plaster, which is mixed with wood fibre instead of sand, being a better "binder," making the plaster very much lighter and it is of such high quality after it has thoroughly set, holds so tight that one almost has to use a hatchet to get it off.

"We challenge comparison of our goods with any other hard-wall plaster on this market, with the full assurance that there is **none** that is equal to it in quality.

"This is a California enterprise run by San Francisco men, and we trust that

you will kindly give our goods the consideration that their merits warrant, and favor us with your trade, as we are confident that it is distinctly to your advantage to do so.

"It may be oi interest to the San Francisco trade to know that the government supervising architect recommends the use of the Plymouth Rock plaster in Federal buildings."

Pacific Mantel Company

A great deal of the pleasure of living in a house depends on the interior details. Nowadays people like artistic things. The day of the old wooden floor, smoky grate and clumsy mantel has passed, and instead the modern building, whether it be for home or business, is fitted with artistic mantels, grates, pretty tiling on floors and also on walls where desirable.

The Pacific Mantel and Tile Company, of 175 Telegraph avenue, Oakland, has on hand a good variety of the most up-to-date mantels and tiles, and it is prepared to make these articles in the particular manner and according to the exact design which harmonizes with individual taste. The Pacific Mantel and

Tile Company has assisted in furnishing not a few of Oakland's newest buildings, and its work is spoken of in pleasant terms by owners and architects.

The Pacific Mantel and Tile Company is fully prepared to install mantels and tile work in hotels and restaurants on a large scale. It also has facilities for installing hot water and steam heating apparatus in homes, hotels and buildings of every description.

Metal Fireproofing

John McGuigan & Co., the sidewalk light men, who also do metal fireproofing, etc., advise us that they have permanently located at 1913 Mission street, this city, and that they are now able to handle anything in that line with promptness and despatch. This firm certainly is deserving of consideration and lots of business.

A Square Furnace

When people say "Furnace" they usually mean a round iron concern with a dome, from which, when it is red-hot, the air is led off to the various registers. "Furnace," as ordinarily taken, means something which only a capitalist can own and keep going; something which, because it's built of galvanized iron, keeps the basement hot, while the frost gathers on the registers up stairs. That's not the Klein Furnace.

The Klein Furnace, though patented August 8, 1905, has required years of work to bring it to its present state of perfection. It's a tried furnace. It's been tested. It is NOT an experiment. It's a revolution in furnace making. The Klein Furnace is "built square." That's the first thing to remember.

Each Klein Furnace is built separately, to suit a particular case. That's the second point. They are not turned out wholesale. Your furnace is built by experts, to suit your particular needs, and no one else's.

The exterior of the furnace is of brick. Galvanized iron does not hold the heat. The Klein Furnace is made in sizes to heat any structure from the smallest three-room cottage to the largest church or school. The radiating surface of the Klein Furnace is between two and three times as great as that of any round furnace on the market. The Klein Furnace will cut in two the fuel bill of the most economical round furnace made.

Mr. Klein, the patentee and builder, will sell state or county rights and would like representatives in all cities on the Coast. The factory is at 53 South Second street, San Jose.

Asbestos Packings

The tendency of modern steam plants to use higher steam pressure than heretofore has called for a better class of steam packings than has hitherto been necessary. The use of packings made of rubber or organic materials is not advisable, as such packings will not satisfactorily withstand the high pressures and high temperatures to which they are subjected.

Packings made of Asbestos fibre, on the other hand, have been found to meet all requirements of this service. The well-known firm of H. W. Johns-Manville Co., has achieved great success with their line of "J.-M." Asbestos Packings, as these are thoroughly reliable and are made in various forms to meet every requirement and condition. These packings possess the highest heat resisting properties, are extremely durable

and do not harden or blow out under the most severe conditions. The H. W. Johns-Manville Co., New York, will shortly issue an attractive catalogue showing their complete line of "J.-M." Asbestos Packings and we understand that copies of this will be mailed free upon request. The Pacific Coast office of the Johns-Manville Company is at 180 Second street, San Francisco.

Cement on the Way

Mr. A. Breslauer, the well-known importer and dealer in cement, has taken permanent offices at 212-214 California street, San Francisco. For the present he will also retain his office in the Builders' Exchange in Oakland. He has the control of some very large consignments of high-grade cement here and it is due to arrive in a short time.

Big Onyx Shipment

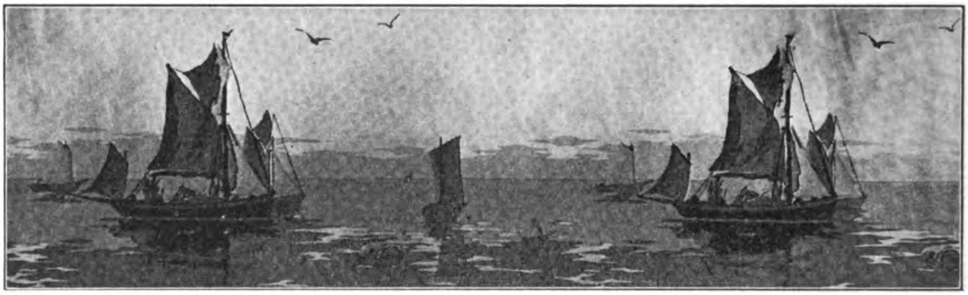
The steamer St. Denis recently arrived in San Diego from the lower coast with more than 200 tons of onyx, one of the largest shipments ever brought in. Part will be sent to eastern factories, while the remainder will be used by the new Pedrara Mexican Onyx Company for the trade in San Francisco and vicinity. Lew C. Black, Bacon block, Oakland, is the local representative.

The Pacific Coast Cement Company, J. J. Abramson, sales manager, 430 Chamber of Commerce building, Los Angeles, with mills at Ambay, Cal., have secured the order for all the plastering for the new Fairmont Hotel. of 1000 rooms which is about to be constructed here. "Holdtite" cement plaster has a well deserved reputation, and the results in a building of this magnitude is a foregone conclusion.

Building for R. N. Nason

The R. N. Nason Company is erecting a substantial brick building one block north of Tenth and Brannan streets and directly in the rear of the company's present works into which it was driven after the earthquake. The new building was designed by Architect Emel S. Lemme. It will be three stories high and similar in many respects to the Market-street building, which was destroyed by the fire. The salesrooms and office of the company will be in this building for the next two or three years at least. After that the company may again establish itself in the Market-street district. It is the intention of the company to rebuild its present temporary factory as soon as the office building is completed. The Nason Company has displayed great enterprise since the April disaster. Less than two weeks after the fire the company was manufacturing paint in its temporary quarters at Utah and Fourteenth streets and since then the company has been supplying without interruption not only the local trade but its sale offices in Los Angeles and Portland.

Harron, Rickard & McCone, machinery merchants, have established an office at No. 316 Market street, which the trade will find more convenient to reach than the old address at Seventh and Berry streets.



L. TOZER & SON CO.
"THE HOUSE OF CHARACTER"

HIGH-CLASS WALL PAPERS AND FABRIC NOVELTIES

We carry the finest selected line of Wall Papers in Foreign and Domestic Goods ever shown on the Pacific Coast. Also an exclusive selection of Cretonnes, Brocades and Tapestries exactly matching our Wall Papers. . . . . .

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2511 WASHINGTON STREET, (NEAR FILLMORE) **1527 PINE STREET, (NEAR VAN NESS)**

"J-M" ASBESTOS ROOFING

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 preserve it.

Write for Samples and Catalog

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

Yates Best Paints

HAVE PROVEN
THE
MOST DURABLE

YATES & CO.

MAKERS OF

PAINTS, OILS, ETC.

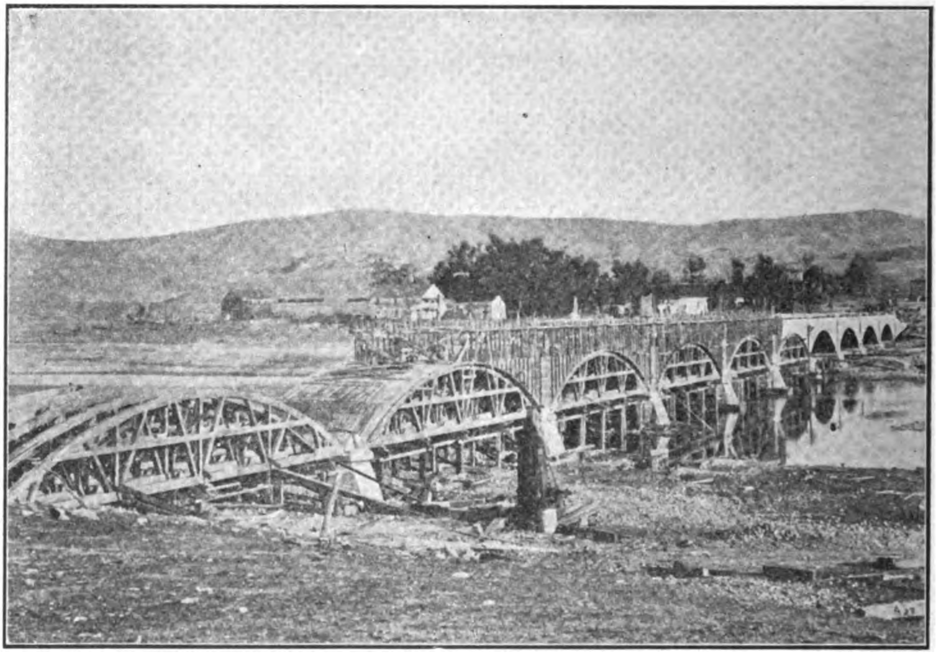
OFFICE: Fifth and Berry Streets
SAN FRANCISCO

Represents Louis Lipp Company

A. D. Dennison has just returned from the East, where he secured the Pacific Coast agency for the Louis Lipp Company of Cincinnati, Ohio, makers of fine plumbing goods. Mr. Dennison is well known in San Francisco, where he was engaged in business prior to the fire, and his friends will be pleased to hear that he is back again. The Dennison Company are also selling agents for the Monarch Brass Company of Cleveland, Ohio, Jas. P. Marsh & Company of Chicago, and the Cragin Hot Water Heater and Garbage Crematory Company of Chicago.

First Concrete Building

The first reinforced concrete building to be finished in San Francisco is that erected for Robert P. Troy on his lot, 50 by 75 feet, on the west line of Third street, 25 feet south of Brannan street. Under the terms of the contract, it had to be completed August 26th, that is to say, in forty working days. The Troy building is divided into three stores, and is one story high. It is built, however, so that four additional stories of the same material may be added when required. In connection with the location of this structure it may be remarked that more frontage of permanent building is being done on the west side of Third street, between Brannan and Townsend streets, than probably any other block in San Francisco.



Bridge at Pollasky, Ten 75-ft. Spans. Concrete Work by Worswick Street Paving Company

PRESS OF THE HICKS-JUDD COMPANY
SAN FRANCISCO

OCTOBER
1906

VOL. VI

NO. 3

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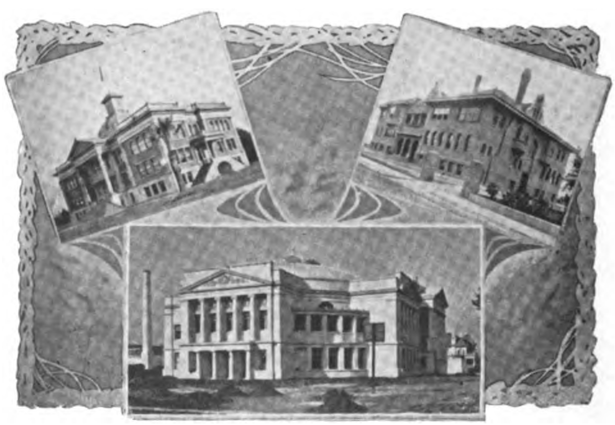

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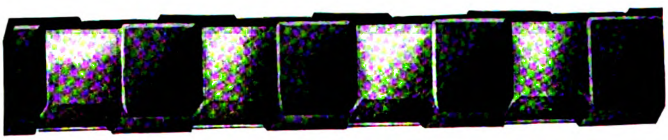
Concrete structure at Selby supporting 60 ton lead ladle reinforced with Corrugated Bars.
Lindgren-Hicks, Contractors



Paper Mill of Reinforced Concrete at Willamette, Or., built by Pacific Construction Co.

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Of California

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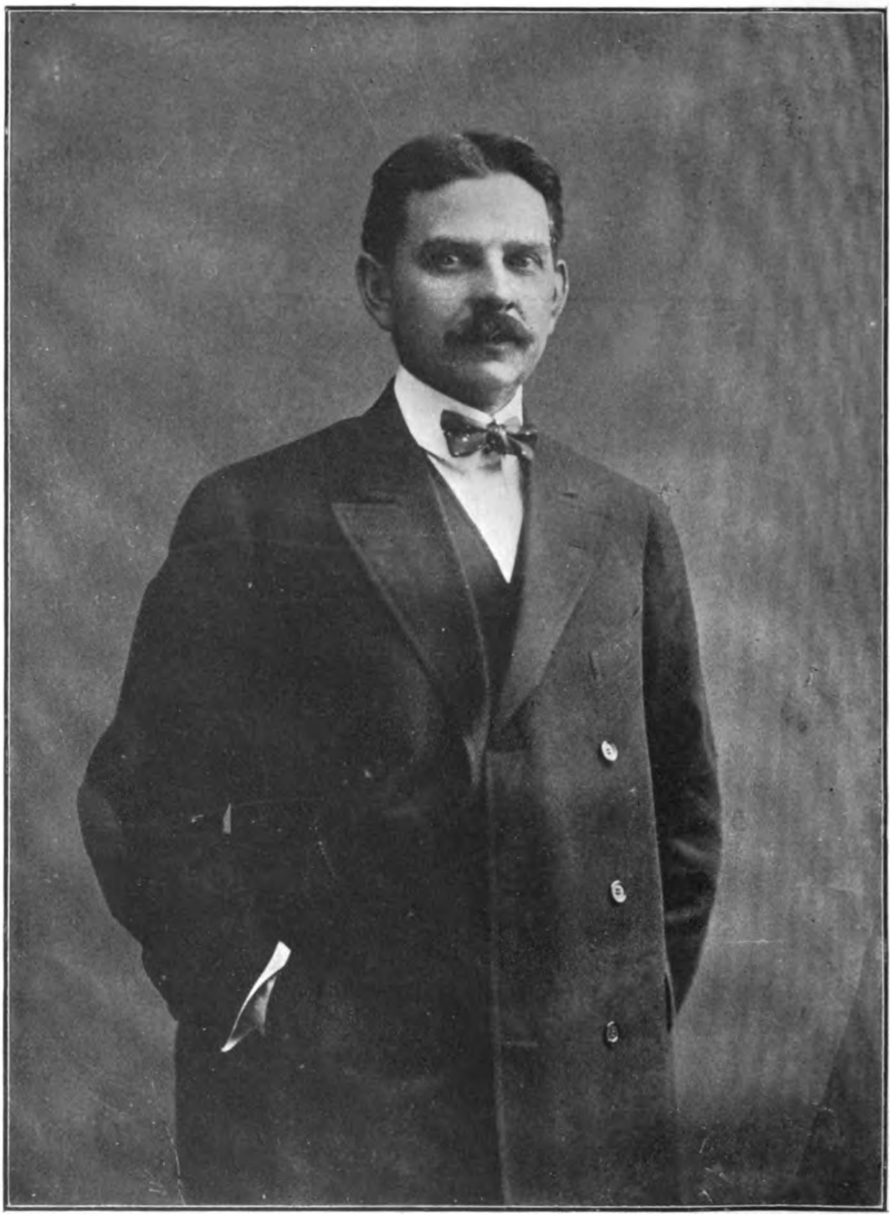


JOHN B. LEONARD, C. E.

THE

Architect and Engineer

Of California

Vol. VI. OCTOBER, 1906. No. 3.

PROBABLY no subject carries greater interest with the architect and owner today than the question of the actual amount of steel needed to properly reinforce concrete. The problems involved are possibly as warmly debated and as little understood as any now confronting the building profession. To economize space, provide as shallow beams as possible where ceilings must be unbroken because of movable partitions, to get all the stories wanted—under the limit of height—without weakening the frame, and to keep the increased tonnage of steel demanded by these conditions down to the least amount consistent with a proper factor of safety—these are some of the more important points touched in the following article prepared especially for Architect and Engineer readers by the coast's foremost authority on reinforced concrete construction. Mr. Leonard needs no further introduction.

Reinforcing Concrete

By JOHN B. LEONARD, C. E.

THE proportioning of steel in reinforced concrete construction is a problem that presents many varied and, sometimes, apparently, conflicting conditions. A little patience, however, convinces one that the law as enumerated in proper formulae is true and inflexible within its limitations, chief of which is the elastic limit of the steel. This occurs because in deducing the formulae, there has been assumed a ratio of the modulus of elasticity of the steel to that of the concrete.

It is a well known fact that when steel has been strained beyond its elastic limit, its modulus of elasticity instead of being 29,000,000 will have dropped probably 75 per cent. To calculate the strength of the beam under this condition, a new hypothesis must be assumed.

In order to keep the working strength of the structure within known limits, such amount of steel must be used that it will not have passed its elastic limit at or slightly less than the desired ultimate strength of the members. The unit stress for the working load should be selected with reference to the elastic limit of the material which is to be used. This condition makes it imperative that the designer should adopt the grade of material he intends to use before proceeding with the calculations of the structure, and the substitution of an inferior grade is only permissible through a revision of the calculations. In order to make a selection, he will calculate the cost on the different types at his command and thus determine how much of the difference in price is overcome by the difference in amount required, giving due consideration to adhesion or bonding conditions.

In executing the design of the structure, the primary object is, of course, to obtain the maximum economy. There are usually so many factors involved in this, that it is rare that the economical section of beam can be used. The cheapest individual beam is one that requires more depth than other considerations will allow. This is true because there is a saving in reducing, at each floor, if possible, the height of the stories measured from floor to floor. This reduction of story height saves in all of the wall construction, columns, and stairways. Therefore, it is proper to diminish the depths to such point as will give in the aggregate the cheapest result.

In reducing the depth of the beams or girders, a calculator should keep clearly in mind the necessity of not sacrificing too much of the element of stiffness, which is a function of the depth of the member. This is usually safeguarded by the rapidly increasing cost due to the additional amount of reinforcing material required, which increases very fast as the depth is reduced. Having proceeded in the calculations to a point of finding out the amount of reinforcement required, there then confronts the designer the problem of properly placing it in the work. In this there is a rich field for ingenuity to accomplish desired results with the least friction and expense. The latitude is not as wide as might appear at first thought, because there are the limitations of the proper transmitting of stress to large sized bars and the avoidance of a multiplicity of small sizes.

The contractor, who is the one who passes the final verdict of expense, will usually incline to the larger sizes and so far as possible his views should be met. The most reliable tests we have at our command indicate very clearly that more strength is derived from a beam reinforced with a number of small bars than with a fewer number of larger sizes. There is also a further advantage in using a number of small bars, in that it is not possible to purchase steel on which the manufacturer will give a guarantee against flaws. If flaws were to occur in one of a few large bars, there would be far more serious results than if it had happened in one of a number of smaller ones.

A multiplicity of small bars is objectionable because of the difficulty in getting the concrete properly in position, and it seems to the writer that this objection is a pertinent one. It is imperative that there should be a sufficient amount of concrete surrounding the bars to enable them to derive the flange stress for which they have been calculated, and the details should be such as to insure this.

Under ordinary girder conditions, it is usually impossible to place the required reinforcement in one layer at the bottom of the beam. To illustrate—there came to the writer's attention some time ago a beam 8 inches in width reinforced with four 1-inch bars, the center of the bars being placed 1½ inches from the bottom of the beam. As these bars could only derive their stress from adhesion, it is a matter of considerable interest to know how the adhesive strength of the lower half of the bar is carried up to the mass of concrete above. If this be improper and 4 square inches of reinforcement be required for this size of beam, then there obtains a necessity of placing the bars in two layers. With this amount of material placed in two layers, the center of gravity of reinforcement above the bottom of the beam has been increased and the effective depth of the beam decreased. In order to properly reinforce the above member, there would then arise the necessity of increasing the amount of reinforcement and by some device providing for additional compression resistance in the upper flange of the beam.

There is no other type of construction in which conditions of continuity are so nearly perfect as in reinforced concrete. The experience of the writer with several tests of this type of construction has shown that a large additional amount of strength can be obtained by providing a proper continuity reinforcement. In fact, I venture the statement that it is safer in most cases to cut the amount of flange reinforcement of a beam at the center of the span, as ordinarily calculated, than to reduce the reinforcement of the upper flange at the point of support, providing this reinforcement extends a sufficient distance into the beam. A structure built without top reinforcement over the point of support is almost certain to crack. There is an unfortunate tendency in the construction of concrete slabs in a steel frame building to make the top of the concrete flush, or nearly so, with the top of the steel beams. The continuity action of the slab produces a tension over the support due to contraflexure moment, which causes a crack there, as is readily observed in floors of this type with mosaic coverings.

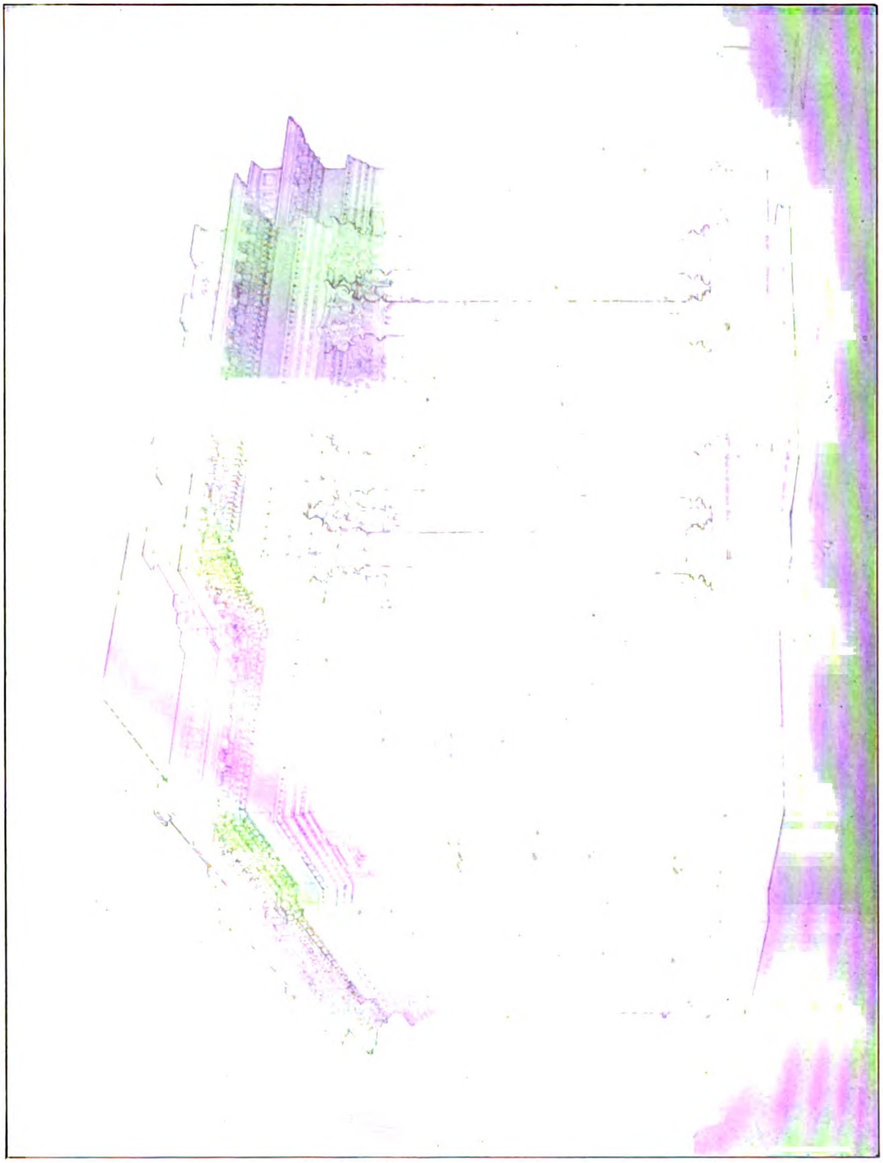
Such structures as are reinforced with indiscriminately selected steel placed in a careless or haphazard manner, can only, upon their completion, give a very unsatisfactory result and will be worthy of attention if they succeed thus far.

* * *

Not Just What He Meant

At a wedding-feast recently the bridegroom was called upon, as usual, to respond to the given toast, in spite of the fact that he had previously pleaded to be excused. Blushing to the roots of his hair, he rose to his feet. He intended to imply that he was unprepared for speech-making, but he unfortunately placed his hand upon his bride's shoulder, and looked down at her as he stammered out his opening and concluding words:

"This—er—thing has been forced upon me."—Philadelphia Ledger.



Residence of Mr. J. W. Thomason, Masonic Avenue and Page Streets, San Francisco
Frank Van Trees, Architect

Architects Must Do Better

By F. W. FITZPATRICK,

Consulting Architect, Executive Officer, International Society, State and Municipal Building Commissioners and Inspectors.

THE Architect and Engineer has done splendid work in pointing out the effects of San Francisco's late terrible fire, calling attention to certain weaknesses of construction and other faults. Its work has been, and rightly, educational. Would it not be a good idea to start in with a series of editorials exhorting the local architects to broaden out in their views, to study more, not to think less of mere design, but to grow up to a point where they can fit beautiful exteriors to sensible, well-planned and lasting construction.

As far as construction goes, building as well as they can, architects in other parts of the country have terrible odds to contend with. To eliminate shoddy buildings, fire-traps particularly, will take a generation's time; with the San Franciscans, it is different. Their's is virtually a clear field and they can plan and build so that there will be nothing to undo. With us in the East we have constantly to be thinking how our new buildings will be effected by their surroundings; you have your own surroundings to create. What will your architects do with their opportunities?

The people put up the money for building, they direct in a general manner what they want in the way of space, etc., but, manifestly, they cannot be expected to also direct how buildings should best be done to prevent their destruction by fire, or in the matter of their sanitation, heating, etc. That is the province of the architect. He is the expert who is supposed to know all about and to control all those details. In the vernacular, it is "up to him." How well he has acquitted himself of the task can best be illustrated by the fact that in all our country there are about 11,500,000 buildings. Their value is something like $14,500,000,000. Of all that number there are but 4000 whose authors even claim are at all fireproof. In most cases that "fireproofness" is limited solely to the structural or skeleton part of the building. In all else they are about as flimsily constructed as is the most "ordinary" building. Of those 4000 there is but one building, the Board of Underwriters Laboratory in Chicago, where all the known methods of fireproofing are assembled under one roof, but **one** absolutely fireproof building in this great country of ours! The others of even the 4000 are damageable from 20 to 90 per cent. of their cost value.

It would seem that the average architects, or even the best of them, believe that by fireproofing the structural steel with hollow tile or with the various substitutes, concrete, etc., some sort of occult transformation takes place and they are relieved by that one act from doing anything else in the fireproofing line. If you don't think that that is so glance at the illustrations and the several reports of the San Francisco fire. Had $10,000,000 more been spent originally on the buildings of that city, it would have meant the saving of at least $100,000,000 in the conflagration, or, to be more specific, if the architects of the 35 so-called fireproof buildings, exercised judgment enough to have spent $600,000 more on their construction, or rather shifted that amount from wonderful ornaments, fine marbles, to the greater essentials of fire prevention, they would have saved those buildings intact, buildings in which at least $9,000,000 destruction has been wrought. Simpler still, had the single precaution been taken of protecting the windows of those buildings, an additional expenditure or a shifting of the sum of $60,000 from frivolous ornamentation to that necessity, the interiors and contents of those buildings would have been intact today.

With those facts clearly before us and a long list of others, the accumulation of twenty-odd years' most intimate association with the practitioners, justify me in the claim that our architects show lack of skill, if not actual stupidity or criminal negligence in planning their buildings. I suppose this sounds like lese majestic, or treason, or something of that sort, but the facts are there and the sooner some one brings them forcefully to popular attention, the sooner may we expect that conditions will be ameliorated.

The architects' training is somewhat against them. Their earliest lessons are in the artistic line, and all too often, the schools, the older practitioners and all the influences surrounding the youngsters conspire to give them a haughty disregard for things merely practical. Let the bids on any building come to more than the owner intends spending and watch the architect tearing down to get within the limit. He will cut off the fireproofing even of the steel, he will rip out the very bowels of that building, if he can only preserve what he deems to be his beautiful exterior intact and certain mantels and other little internal fussiness. He forgets that real beauty is truth and that the very first purpose of any building is to have its interior adapted to the business for which it was built, its exterior merely clothing that interior, permanent and undamageable by the elements and then what is left of the money used for a chaste adornment or ornament of the exterior and of the interior.

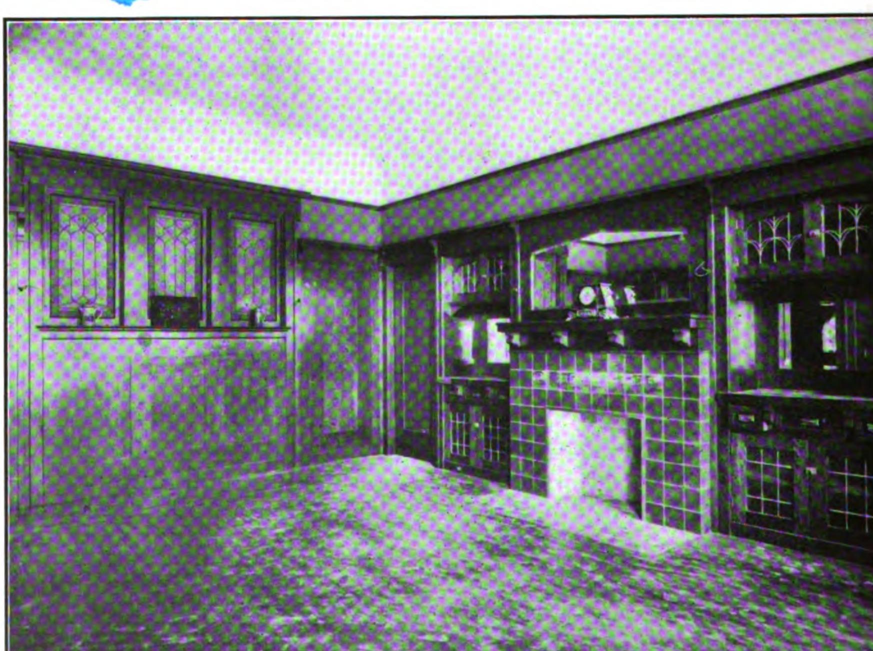
Our civilization has grown very complex and with alarming rapidity, and our architects have not kept up with the procession. To put it plainly the job of building has become too big for nine-tenths of them and the other tenth who know more than their confreres are generally too busy in the executive functions of the profession, committees, dinners, social functions, the getting of large commissions, etc., that the world is really not over-much benefited by their versatility.

True, the structural engineer has been brought into requisition and also the heating expert, the sanitary man and so on as auxiliaries' aids to the architects. But each one makes the mistake of believing that his profession is the leading one and that all else should be subservient to it. He is jealous of everyone else and the architect, the executive officer, has a dickens of a time reconciling these various experts, adjusting their squabbles. One would think that the structural engineer's province would be to help out the architect in a general system of fireproof construction, but bless you, he himself knows mighty little about it. He is long on learned dissertations about the "modulus of elasticity in concrete," he can beautifully arrange the riveting of his columns and girders and adjust to a hair's breadth the factor of safety, he knows how to figure out re-inforced concrete—particularly the 127th patented system, his own—so that there will be less cement and far greater strength than in any other system, but he will never advise the architects to close his stairs and elevators, to make smaller his units of space, to protect his windows, or anything of that sort. He brushes that aside, that is not engineering to him.

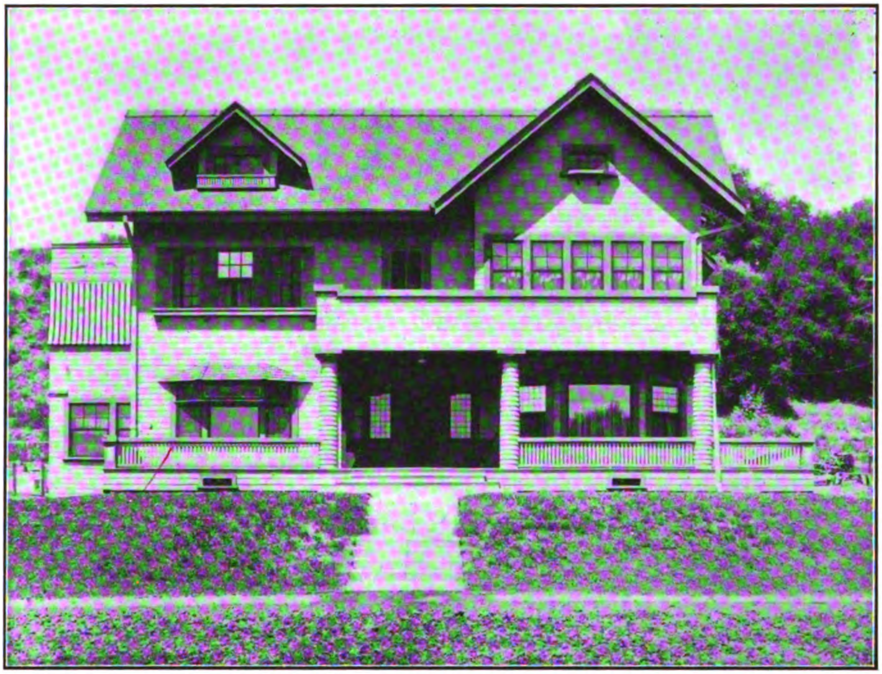
It resolves itself into this that if the architects themselves don't know enough—and they certainly have not shown any wonderful acumen in the matter heretofore—about fire-prevention to properly devise and plan and construct their buildings, and are too jealous of their own high prerogatives, and supposed all-covering knowledge to call in experts who do know how to adjust and connect *all* the branches of building so that one does not vitiate the other, then it is clearly "up to the" owners of projected buildings to take the matter into their own hands and have their plans passed upon by a real fire expert such as Mr. Reed of the Committee of Twenty, for instance, before they begin actual operations. These operations frequently consist, so to speak, in figuratively shoving hundreds of thousands of dollars into a rathole. Business men take the very greatest precautions before going into ordinary business deals. If it is real [illegible]ate, they have the titles examined and everything done up in excellen[illegible]m; if at law, they carefully select their attorney and he must be a p[illegible] knows all about that special kind of litigation and has made [illegible] of it. When it comes to building, a transaction that involves c[illegible] a hundred-fold as much as his other deals, he will confide h[illegible] and soul, as it were, to a young cousin of his wife's, to the prot[illegible] friend or other more or less unknown and very possibly [illegible] fellow whose principal equipment in a professional way is [illegible] his door "Architect." The result is that fire costs us, for [illegible] partments, money wasted in insurance, etc., a sum equal [illegible] yearly on $10,000,000,000. In other words that capital migl[illegible] amount we have invested in stupidity!

Under proper direction, in a generation's time or so[illegible] flimsy buildings have been destroyed and a better class [illegible] fledged fireproof construction, with its attendant incre[illegible] will not be so necessary. In a town where all the buildin[illegible] combustible, the precautions we have to take now to [illegible] fire-resisting, will not be needed. There is so much infla[illegible] us, fire and conflagrations hazards are so great, so e[illegible]at the very top-notch of precautions have to be taken wi[illegible] buildings that *are* built now whose owners have any desire to preserve them. It is a condition that has been brought about by our own folly, or, to be more specific, our architects' rank incompetency. We have to face that condition, and for a time go to an extraordinary expense and exercise the utmost care to make our buildings superlatively fire-resisting. The architect has not done so heretofore; that he will do so hereafter is a matter of some doubt. The engineer (nine out of ten of him) is purely and solely, a structural specialist. The fire experts are few and far between and the chances are that the great bulk of our people will have to be satisfied with insisting upon their architects complying with the generalities of the art of fireproof construction as set forth in technical journals that really give any attention to that most important subject. If a man desires to learn another language than his own the proper caper is to get a teacher who knows that language thoroughly, the country, its customs and all about it; if he cannot afford that then he can at least get a smattering, a dab at that language, perhaps enough to keep him from being led astray in that strange land if he visits it, by studying "French at a Glance," or some of those other many text-books that are indeed most helpful. A little knowledge of a subject, some very ancient authorities to the contrary and notwithstanding, is infinitely better than absolute ignorance thereupon. It will at least show one how much more there is to be known and perhaps give him a proper appreciation of how very little he does know and an incentive, a willingness to acquire more if it is at all gettable.

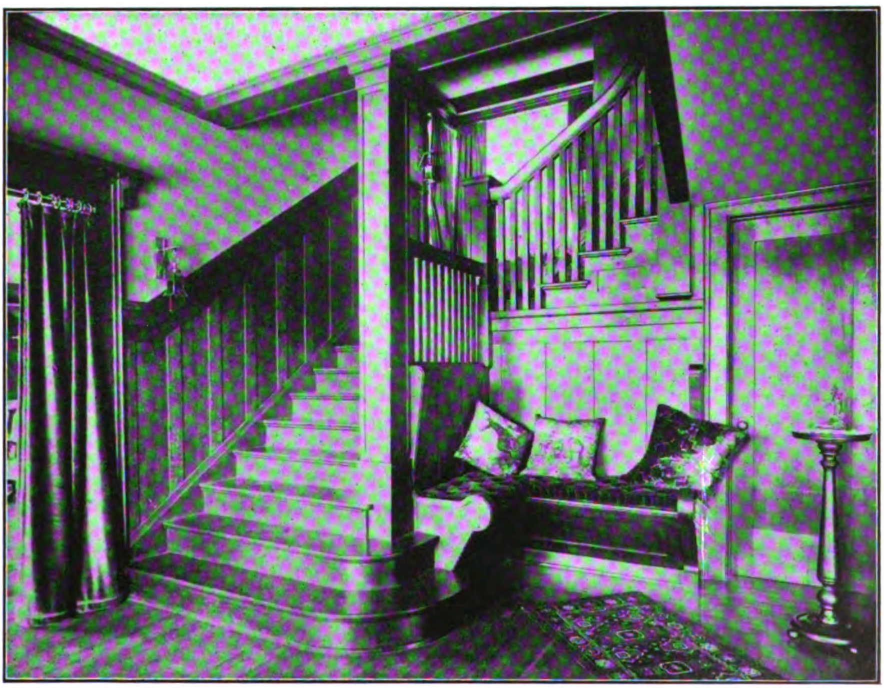
The Pellisier Residence, Los Angeles
Fernand Parmentier, Architect



Corner of the Dining Room in the Pellisier Residence
Fernand Parmentier, Architect



Residence of Mr. F. P. O'Connor Los Angeles
Fernand Parmentier, Architect



Hallway and Staircase in Residence of Mr. F. P. O'Connor, Los Angeles
Fernand Parmentier, Architect

Shelter First---Then Permanency

By THEODORE STARRETT, of the Thompson-Starrett Company.

WHAT can one now say about the rebuilding of San Francisco that has not been said a dozen — yes, a hundred — times, before? Prophesies of the city's future have run the entire gaumet from total abandonment on the one hand to complete rehabilitation in a twelve-month on the other—a rehabilitation in which perfection would be attained, an ideal city beautiful with all the defects of the original city eradicated.

Neither of these extremes can or will come true. The abandonment of the town is an impossibility, as anyone who studies the situation will quickly admit. Look at the map and see what San Francisco is—the heart of a vast traffic, grown in response to natural demands. And this heart is simply stripped of its shelter for a time. In the first shock of the rude uncovering the city paused for a brief moment. Men spontaneously intuitively, without putting the idea into words, her citizens with one accord rushed to the work of repair.

Let the extremists, of which every class, pessimist or optimist, shout and preach as they may, San Francisco will pay no heed to them. Without another pause she will do the one thing to do: She will repair her covering. Her vast business needs a roof to cover its nakedness and a roof it will make for itself regardless of friend or foe. After the shelter is made plans for permanent housing will be considered.

I once read a story in a newspaper in which the great city was compared to a palimpsest or manuscript parchment used over and over again by the monks in the middle ages. The first writing was erased to make way for a second. Then another monk would have his story to tell and he would erase again, and so on. The site of a great city is a palimpsest. The number of records written and then erased and then written again only to be erased again would make the rarest palimpsest turn green with envy.

Everything in the city destined to greatness is subject to change and replacement. Nothing can be built big enough nor correctly enough to take care of the future, for the very good reason that even though prophets, were among us to tell how to build for all time, they would get little heed. I think the saying that a prophet is not without honor save in his own country must have been made for these. Perhaps it is for the best after all. The city of Washington was laid out by prophets in the persons of the father of his country and his advisers, but no other great city has had the luck to be so conceived, or being conceived, the luck to survive. A divinity must have had that city under her tutelage.

But Washington is the exception which proves the rule. The business interests which are responsive to the pressure from all along the great arteries which focus at San Francisco cannot wait for prophets and dreamers, and so the town site is being "carpeted" with temporary buildings as quickly as possible.

When the "carpeting" is done, then will be time for beautification with widened streets and civic centers and all that sort of thing. And the sooner and more shabbily the work of "carpeting" is done the better the chance for the new story which the modern palimpsest shall tell.

The activities which are now starting up in San Francisco are startling in their significance and their potentialities. A boom is upon the city like that which occurs on the occasion of the building of some great

World's Fair, but this World's Fair will exceed five—yes, ten-fold—any fair that we have ever known and the best part of it is there will be no recoil or reaction such as has occurred all too often in the case of some of them.

The Chicago World's Fair taught a wonderful lesson to the people of the United States and of the World, and Daniel H. Burnham is beginning to have a foretaste of the immortality that shall be his because it was he who saved it from mediocrity; it was he who fought to make it the beautiful Dream City which marked the step by which America took rank with France as a country of fine architecture.

San Francisco does herself proud by being one of the first cities, if not the first, to show an appreciation of Mr. Burnham and his work. It is to be sincerely hoped that no selfish and narrow interests will turn the city from her destiny, the City Beautiful, by defeating the plan of getting Mr. Burnham to guide the rebuilding—not the first rebuilding, for that will take care of itself—but the second rebuilding, when, if San Francisco gives ear to her best men, she will make a palimpsest with but two more narratives, the second one so beautiful that none will dare to erase for a third rebuilding.

* * *

Wanted: Fire Insurance

AS the result of frequent conflagrations in the congested districts of cities in the United States, fire underwriters are beginning to "unload" a portion of their liability in those places as a precautionary measure.

This means that business men and owners of property in congested districts cannot ignore much longer the fact that sooner or later they must protect themselves against losses by fire, instead of relying solely on fire insurance.

There are two reasons for this threatening situation: (1) The fire hazard under present conditions, conditions which favor the destruction of blocks of the most valuable business property in a single fire, is almost uninsurable. (2) Frequent conflagrations in congested districts must have the effect of diminishing the amount of fire insurance obtainable, leaving large property values not protected.

From the year 1860 to the year 1904, both inclusive, the stock fire insurance companies doing business in the United States issued policies for amounts aggregating $442,225,685,657. The premiums paid for that insurance amounted to $3,622,406,354.

The amount represented by the policies bears witness to the importance of the whole matter; to the fact that we are a thriftless nation in creating such tremendous fire hazards; and the amount represented by the premiums is a part of the tax we have paid for our stupidity and recklessness.

Every merchant and every property owner pays for his own fire risk and a part of his neighbor's—the "exposure" hazard.

To protect credit, business men must face the situation as it is, or will be, and be prepared to "carry their own risk." Unless this is done, untold embarrassments must ensue.

The situation may be met by adopting fire-resistive construction for buildings, equipping them with modern appliances and apparatus for discovering and extinguishing fires, and by protecting every building against the spread of fire from one building to another—The "exposure" hazard.—*Insurance Engineering.*

Advise Steel Frame and Reinforced Concrete for State Buildings

AT the request of the State Lunacy Commission, John Galen Howard, architect, and John D. Galloway, engineer, both of San Francisco, have made an examination of the State hospital buildings at Agnew which were badly damaged by the earthquake, and the report of the two experts brings out some important points affecting future building in California. Reid Bros., architects, have also submitted a report which is in perfect accord with the recommendations of Messrs. Howard & Galloway. By courtesy of Dr. Stocking, superintendent at Agnew, both reports are herewith made public for the first time:

The State Lunacy Commission, Capitol Building, Sacramento, Cal.

Gentlemen:—In response to your letter of August fifteenth, we made an examination of the buildings at the State Hospital at Agnews, on August eighteenth, Dr. Stocking being with us in our investigation. Plans of the various buildings were furnished us, in addition to which, the foundations had been exposed in places in such a way that their character could be determined. As all the buildings were constructed with a basement, it was possible to examine the foundations with ease and a knowledge of their condition could be obtained.

We agree with the statement made in your letter that none of the superstructures of any of the buildings is available for use. The walls of all the buildings are so badly shattered that they should be taken down to the foundations.

The question which arises as to the value of the present foundations in any reconstruction on the Asylum, necessarily involves the discussion of the type of building construction best adapted to withstand the effects of earthquakes. Authorities are agreed that in the earthquake, there are two principal movements of the earth, vertical and horizontal, the latter being the greatest in most cases. The result of the horizontal vibration of the earth is a tendency to shear the walls along a horizontal plane, the inertia of the mass of the building preventing it from following the earth motion. Such effects may be seen plainly in the men's cottages at the Asylum, where entire walls moved from two to three inches, or were entirely overthrown. The vertical movement of the earth raises one portion of the building, thus cracking the walls. The net result of the two earth movements is that a swaying motion is produced in the building, causing the destruction of brick walls, cracking of plaster and movement of roofs.

Obviously, in a region subject to earthquake shocks, a building should be constructed to resist the kind of stresses induced by the earth movement. Brickwork or stone masonry, laid in courses and without adequate binding and bracking elements, is the poorest form of construction possible in the case, especially if mere lime mortar is used. The horizontal joints of mortar are immediately broken and once this occurs, there is a destruction of the walls.

What is needed in a building, designed to resist earthquake stresses, is a continuous frame from the foundations to the top, possessing rigidity, but elastic, so that when deformed, it will return to its original shape without substantial injury to the parts. Brick and stone masonry are very rigid but totally inelastic. Once movement of any kind takes place, there is a breaking of mortar joints and once these are broken there is no tendency whatever to return to the original position.

The movement of a brick building causes diagonal stresses in the walls, which the mortar joints are incapable of resisting. In all such structures, therefore can be seen the diagonal cracks crossing each other like a letter X, and in most cases completely disintegrating the wall.

The question arises here as to whether, if the masonry be formed with joints of cement mortar, the result would be better? This would depend upon the intensity of the shock. Such a structure is practically rigid and would resist the earth forces by the strength of joints, without yielding, as it is inelastic. This is shown in the Appraisers' Building in San Francisco. If the forces are too great to be resisted thus, the resulting destruction is greater than in the less rigid structures. A case to the point is the tower of St. Patrick's Academy at Menlo Park. The buildings there were exceptionally well built, Portland cement being used with the lime in all the joints. The central tower was built with all joints laid in Portland cement, no lime being used. The destruction was not as great as at Agnew but the tower was completely destroyed. This but calls attention to the fact that elasticity and not extreme rigidity should be the thing sought for.

A consideration of all the forces liable to affect a structure, its own dead weight and the horizontal and diagonal stresses caused by earth motion or wind pressure, leads to the conclusion that only by supplying a frame made up of continuous vertical members and horizontal beams and girders, thoroughly tied together and properly braced, can a building be made that will resist the earthquake shock.

One solution of the difficulty of making a structure to resist earthquake stresses is found in wooden frame buildings. Here the vertical studding resists horizontal stresses when properly braced with diagonals. Relatively few modern buildings of this class failed and most of the failures can be traced to poor foundations or an actual sinking of the earth.

Another solution is found in the frame of reinforced concrete. Properly designed, such a structure has vertical columns and horizontal beams and girders that allow it to resist earthquake stresses. The material is elastic. Some few cases exist, such as Roble Hall and the old portion of the Museum at Stanford University and a factory building in Alameda that withstood the shock without material damage.

In the opinion of the writers, however, the best form of structure to resist earthquake shocks is the steel frame, combined with reinforced concrete floors and walls. Excepting the walls, which were of brick, there were about twenty buildings of this class in San Francisco and Oakland that withstood the shock without substantial damage.

Reference is here made to structures, where the steel frame supported the entire weight of walls, floors, etc. Buildings, of which there were about twenty-five in San Francisco, with a steel interior frame and concrete or tile-arch floors but with self-supporting walls, fared nearly as well.

Coming now to the buildings at Agnew, the foundations of all of the main buildings and one of the cottages are of brick. Those of three of the cottages are of concrete. Speaking generally, all work below ground line is in as good condition as when built. Up to the first floor level, most arches are cracked at the crown and in many cases brick piers, large and small, are cracked, many being completely shattered. Concrete walls under cottages are intact, excepting a few minor cracks. The light brick walls above this concrete are generally broken.

We cannot recommend the rebuilding of the structures in brick. The original plans were made upon lines of common practice, except that

9-inch walls, such as are used in cottages, are not good practice. The workmanship was but ordinary, the lime mortar being of indifferent character. Probably better workmanship would not, however, have saved the buildings, the fault being in the type of construction. To rebuild in brick would be but to invite similar destruction in the future.

If the Asylum is built of timber framed structures, the present foundations are adequate, with such repairs above the ground line as might be found necessary by the architect. About twenty per cent of the interior piers and walls above the ground line should in any case be rebuilt. In the opinion of the writers, wooden buildings are wholly unsuitable, except as the merest temporary makeshift. Such structures are cheaper but the cost of maintenance and insurance, their rapid deterioration and the danger from fire would seem to render their use out of the question in a permanent public institution like that at Agnew.

We recommend as the type of structure to be adopted for the Asylum buildings that with a complete steel frame, properly connected and braced, combined with reinforced floors and walls. Partitions should be made of solid cement mortar, on a frame of steel studs and metal lath. The present frame of the water tower at the Asylum, which is without injury, illustrates the type, without the floors and walls.

If such a type be adopted, the present foundations would be inadequate and should be abandoned. This type of construction concentrates the weight of the structure on isolated piers under columns, and as the present foundations are under continuous brick walls, they are not adaptable, either in form or in method of construction.

We strongly recommend to your Commission the advisability of adopting the above suggested type of construction. Experience has shown that it is little damaged in an earthquake, is practically fireproof, even in a general conflagration, to which the Asylum buildings are not exposed, and is superior to all types in sanitary value. An erroneous impression exists that this type of construction is very costly. In but few cases does the cost exceed by more than ten or fifteen per cent that of a building with brick walls and wooden floors. In the case of the Asylum buildings, where all partitions were of solid brick, it is believed that the proposed type would have been as cheap as the ones constructed. It is believed that the old brick now on hand could be broken up and used as concrete, thus effecting a considerable saving. Experiments are now being made at the State University to determine this.

Reinforced concrete buildings without steel frames might be used, but as there were but few instances of this class of buildings subject to the earthquake, we do not consider this type as a settled one. If such be adopted, great care should be exercised in the selection of an architect. The type is relatively a new one, and while a number of persons are posing as experts in that form of construction, but few are competent, either from experience or study, to correctly design and execute such structures. Great care in the making and placing of material must be exercised. This must not be understood as discrediting reinforced concrete, but as a suggestion regarding it, if it is used.

Summing up, we note the following points:

Brick buildings even of the best construction were destroyed by the earthquake of April eighteenth, 1906.

Buildings of timber frame were little injured.

Buildings with a steel frame, properly braced, were uninjured.

A few low reinforced concrete buildings were uninjured.

The foundations at Agnew are, with few exceptions, in good condition to rebuild:

(a) With brick walls as formerly constructed;
(b) With timber framed structure.

We cannot recommend (a) as it simply invites future destruction.

We recommend (b) only as a temporary makeshift in case money is not immediately available for better building.

We recommend the steel frame and reinforced concrete for the rebuilding.

In case the recommended type of construction is adopted, viz: a steel frame with reinforced concrete walls and floors, the present foundations are not adapted for use and must be discarded.

The cost of the recommended type is but little, if any greater than that of the present structures.

If buildings of reinforced concrete be adopted, the height should be limited to two stories and only specially experienced architects and workmen be selected. In this type of construction, the present foundations are not adatable and should be discarded.

We suggest what is known as the "Cottage Plan" for the rebuilding.

Possibly we have gone beyond the limits desired by your Commission in the discussion, but as the use of the foundations necessarily involves consideration of what rests upon them, we have treated the subject in its entirety.

Respectfully submitted,
(Signed) JOHN GALEN HOWARD,
(Signed) J. D. GALLOWAY.

The report of Reid Bros. follows:

Hon. Board of Management, State Hospital for the Insane, Agnew, Cal.

Gentlemen:—Acting by request of your board, we beg to make the following report on the condition of the main Asylum buildings at Agnew:

The cottages should not be repaired or restored on the present founda-

The foundation walls of the Administration Building, and the wings thereto, formerly occupied by male and female patients, can, up to the level of the under side of first floor joist, be made at small expense, as strong as they ever were.

The use of the walls so repaired, however, would compel a system of construction similar to the old, and since experience has shown such construction to be unsuitable for the purpose, we consider it inadvisable to attempt restoration on the old lines.

The belief, long entertained by building engineers, that steel cage construction (carrying all walls on the steel) with a good system of floor arches, would prove stable under any conditions likely to arise, having been confirmed by late events, we believe such system offers the best means of obtaining relatively economical structures capable of affording absolute safety to occupants.

When the area of ground for the purpose is ample, as in this case, it will in our opinion, from the point of increased safety, convenience of operation and architectural beauty, be best to build only two stories above basement.

We are unable without access to the drawings of the old building, or more accurate information than we now have as to the floor space required, to estimate the increased cost of steel fireproof construction, over the system employed in the old work.

Since, however, the brick now on the grounds are of good quality, and if properly cleaned, can be used again, and as it is probable that (in the light of experience gained in the operation of the institution) a con-

Design for Odd Fellows' Temple, Oakland
S. B. Zimmer, Architect

siderable saving of floor space can be made, or its equivalent found in accommodation for an increased number of patients, if the old area be still retained, it would appear practicable to keep the cost of rebuilding within a limit not greatly in excess of the expenditure required for restoring the building on the old lines.

Yours very respectfully,

(Signed) REID BROTHERS.

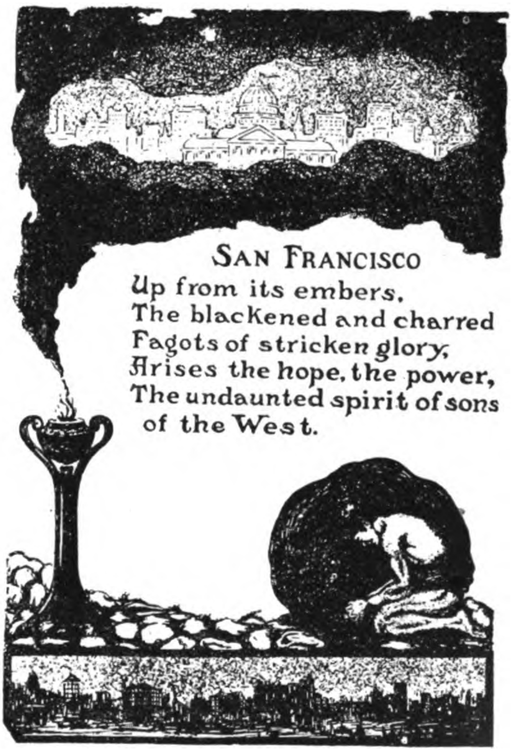
September 12, 1906.

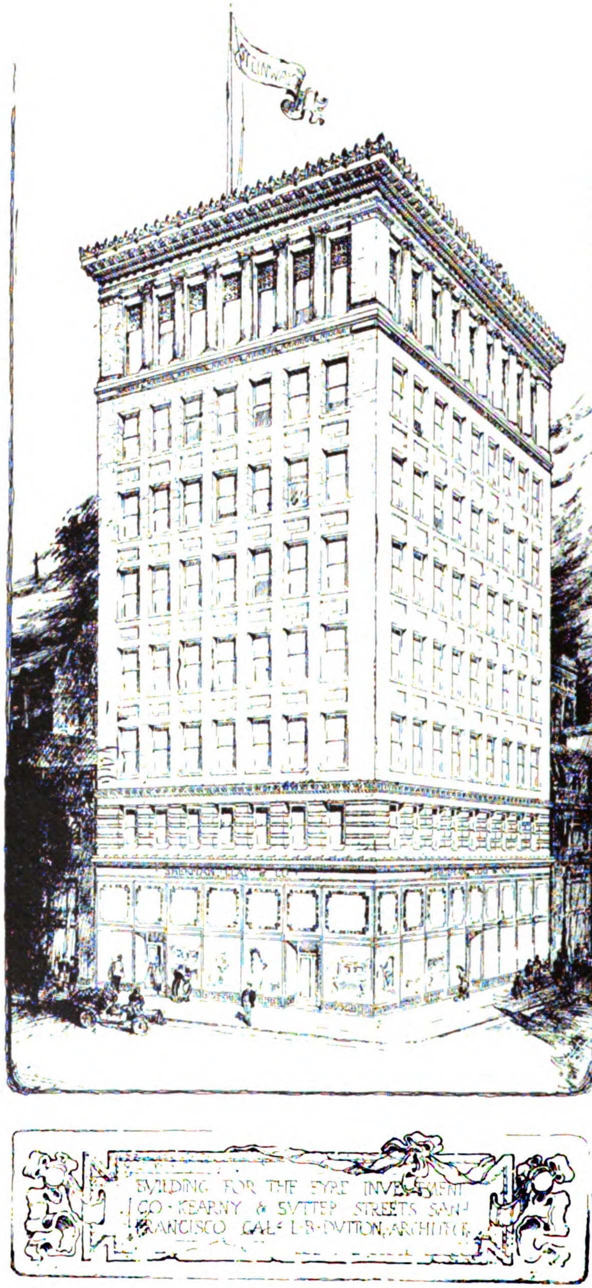
* * *

"Mr. Jones," said the office boy, "I got ter get off dis afternoon. Me gran'mother is dyin'." "I've something for you to do to-day, Johnnie," said Mr. Jones; "but you may go at 4 o'clock." "Aw! wot good is 4 o'clock?" —Judge.

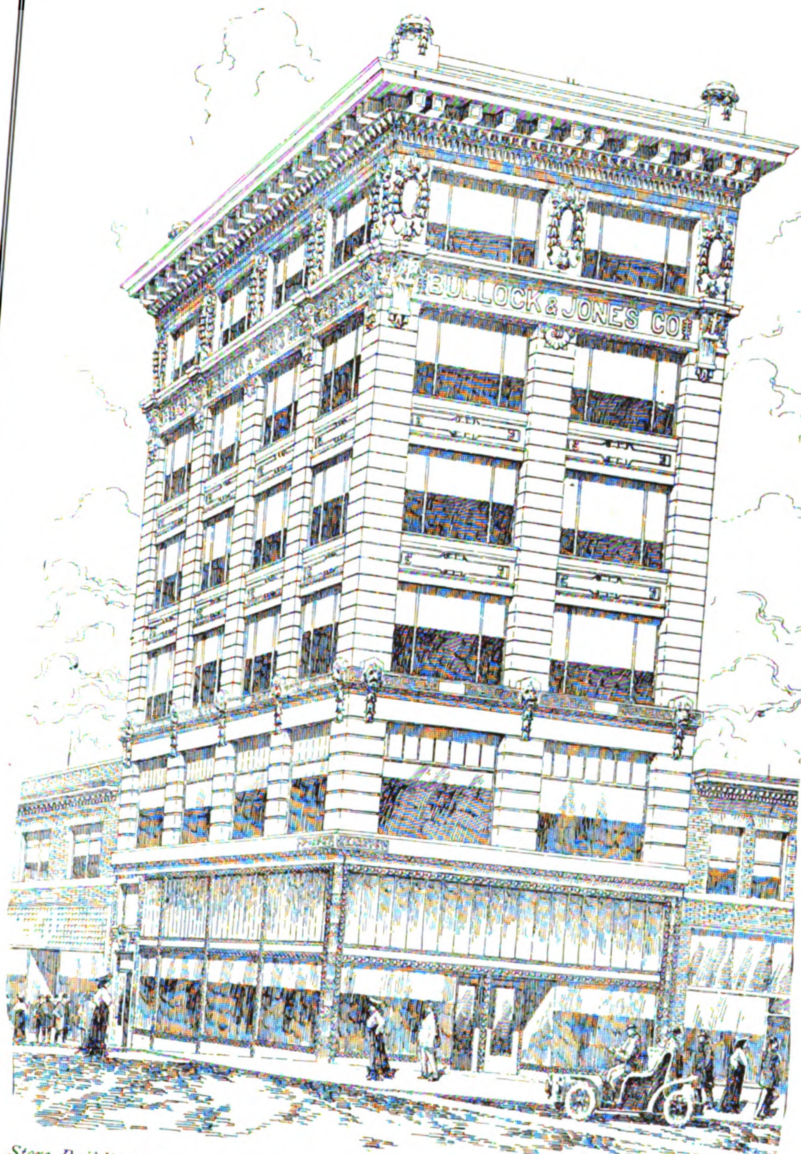
For the New San Francisco

Being a Series of Architects' Drawings of New Buildings for Immediate Erection in the Metropolis of the Pacific Coast.

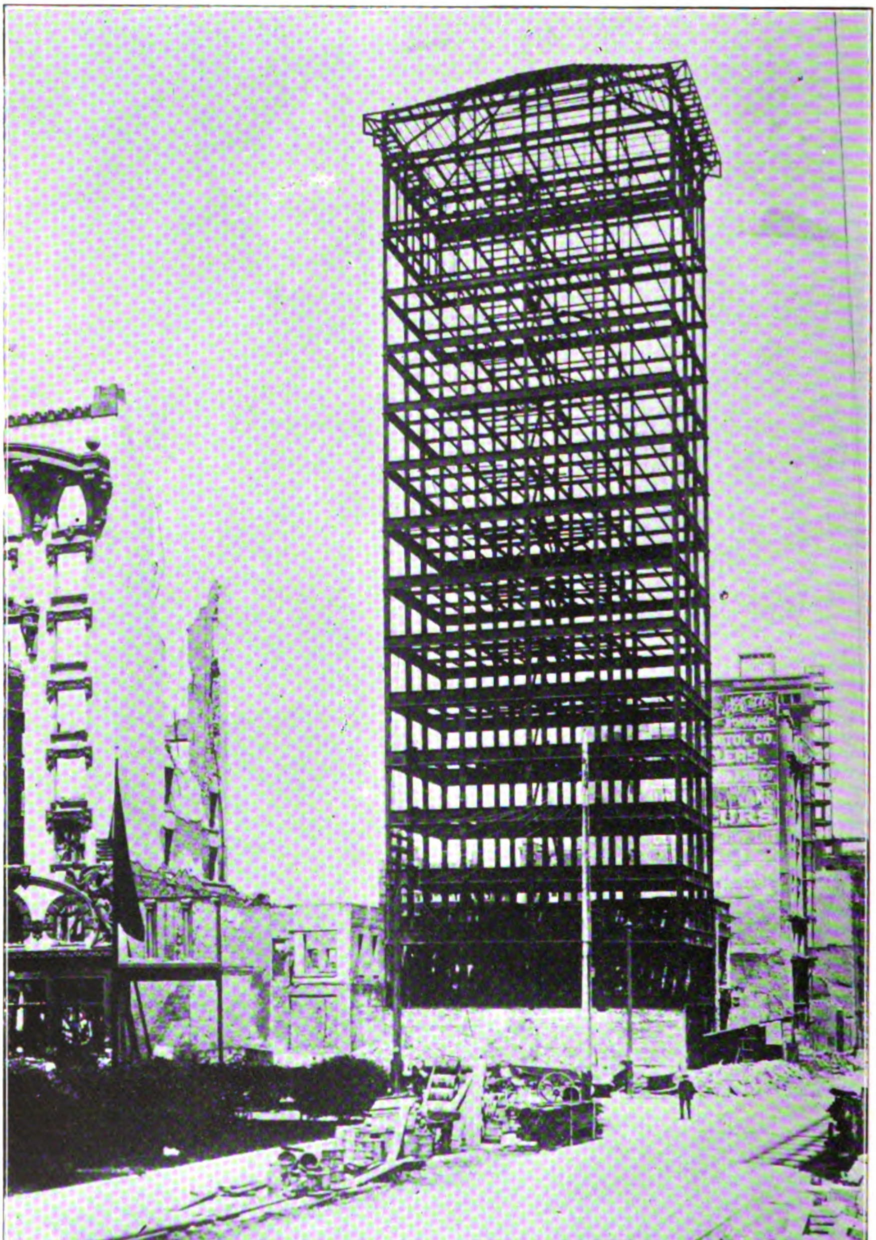




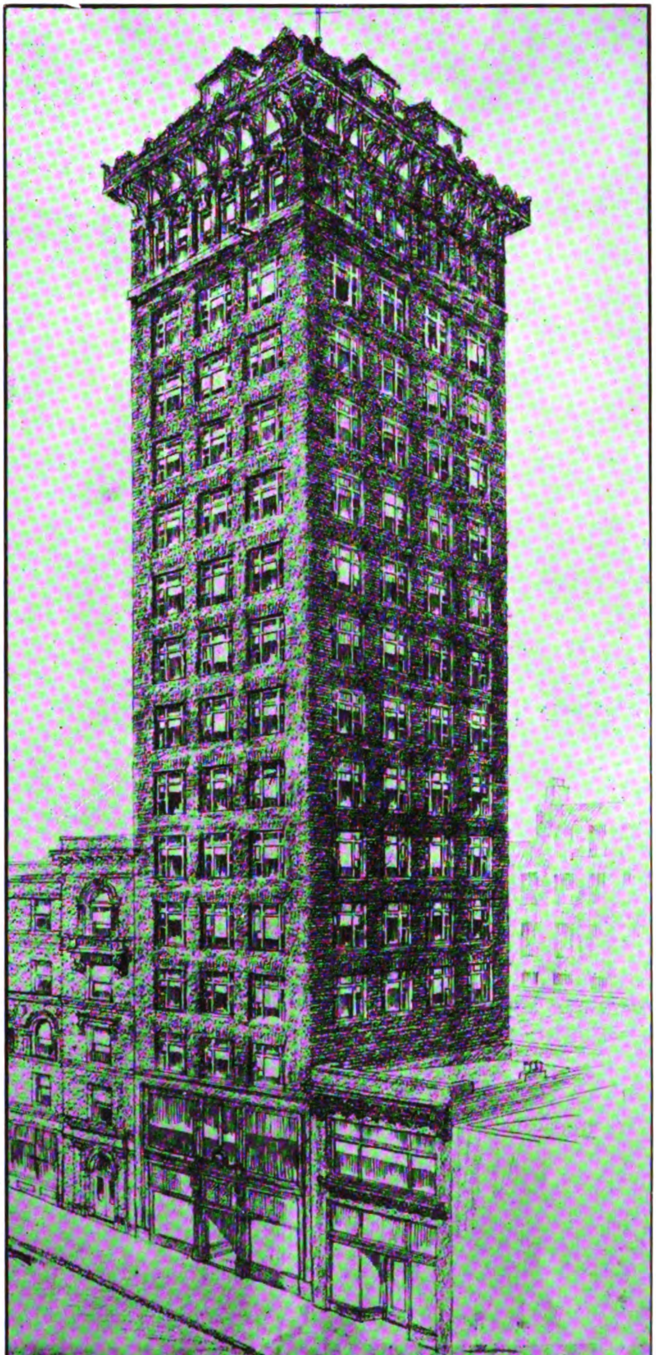
Thompson-Starrett Company, Contractors



Store Building for Mr. Lewis Meyerstein to be Built at the Corner of Kearny and Post Sts., San Francisco
Julius E. Krafft, Architect

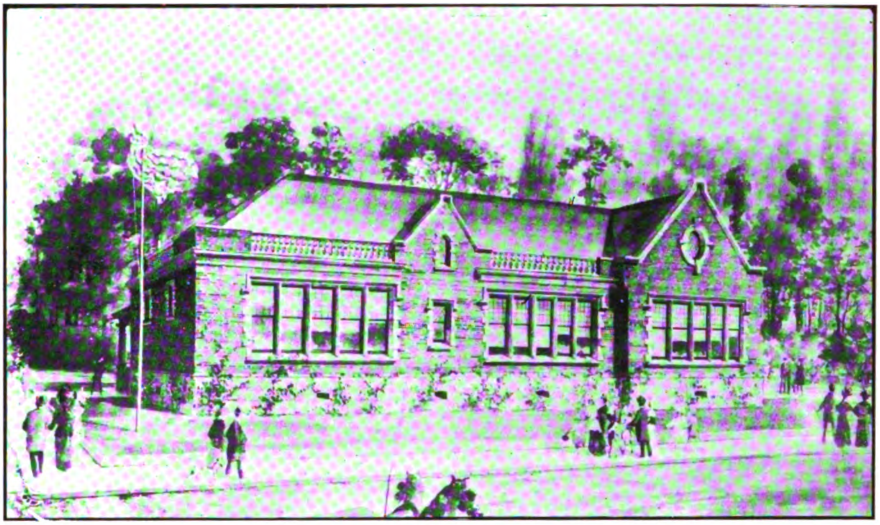


Steel Cage of Whittell Building, Geary Street, San Francisco
Frank T. Shea, Architect

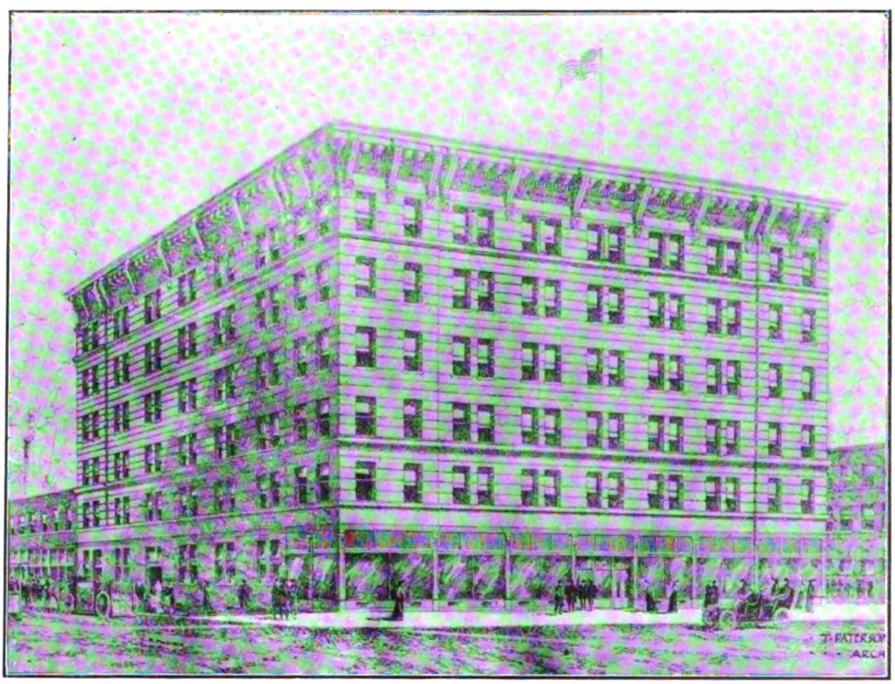


The Whittell Building as it Will Appear When Completed
Frank T. Shea, Architect

The Flannery Building, Market and Kearny Streets, San Francisco, the First Reinforced Concrete Office Building to be Erected in the Burned District
Stone & Smith, Architects



Design for School at Modesto
Stone & Smith, Architects



Zellerbach Building Now Under Construction, San Francisco
Ross & Burgen, Architects

Fire Remedies Suggested by Expert

THE conditions existing at the time of and governing the progress made by the San Francisco conflagration are ably presented in the report of the committee on fire prevention of the National Board of Fire Underwriters. This report is the result of the investigations by Albert Reed, consulting engineer to the committee, who was sent out to make an investigation immediately after the fire. Mr. Reed gives valuable data concerning existing conditions and regarding the effect of the earthquake. He says:

"On the solid ground the action was confined to shaking, in which the upper parts of structures were apt to experience a maximum oscillation. In soft ground there were permanent displacements which resulted in a distortion of the lower parts of structures where foundations did not go through to solid ground.

"This is illustrated by the cases of the Aetna building, the postoffice and the car tracts at the foot of Market street, all of which were on foundations going through the few feet of soft materials. They show but slight change of level, although the streets adjacent have sunk away. The damage from shaking was seldom ruinous, except in topheavy structures, whereas that from displacement was generally structurally destructive.

"The actual damage, though appalling to those who experienced the shock, was not as a general rule structurally serious so far as appearance went. Apart from buildings having ponderous architectural attachments, particularly the City Hall where the damage was great and spectacular, the apparent structural injury was mainly to tall chimneys, church towers and unbraced brick gables, copings and projections.

"The effect on fireproof buildings was especially important, as the steel frame type had never before been seriously tested in an earthquake. It may be said, generally speaking, that these buildings had no apparent structural injury. The steel frames appeared plumb and true, and, contrary to the early account, neither the sides nor the doors had dropped out."

Mr. Reed, as the result of his investigation, reaches the following conclusions:

The most notable facts of this conflagration are not so much the confirmation afforded to generally accepted views, as the light thrown on debated matters connected with fire protection. Among previously accepted views which were confirmed are the following:

The paralyzing effect of a number of simultaneous fires.

The weakening of the fire-fighting force as it thins out over a wide front.

The impossibility, with existing methods, of front resistance to the sweep when the wind velocity exceeds a certain critical figure.

The special vulnerability of leeward up-slopes.

The futility of explosives, except where there is close co-operation with hose streams.

The structural ruin in conflagration of all wooden-joist brick buildings where the stability of the walls in any way depends upon the bracing by the beams.

The limited utility in a conflagration of rear and side shuttering where front windows remained unprotected.

The structural survival, even without window protection and when abandoned, of steel frame buildings with fi:eproof floor arches, provided the steel frame is properly incased with fire-proof material, the structural damage being in close proportion to the excellence of the frame protection.

The most notable facts in respect to the light thrown upon debated matters are as follows:

First—The case of the Bush street Telephone Exchange, which had a high type of window protection, but was full of combustible contents, was shut up tight and abandoned and the window protection resisted successfully the general sweep of the conflagration; but some unascertained leak admitted the spark which originated an interior fire, causing as complete interior destruction as if there had been no window protection at all.

Second—The partial success of the South Mission Telephone Exchange, a window protected, fireproof building, in a frame district. This building was abandoned and yet survived with two floors in habitable condition and a large part of the switchboard equipment intact.

Third— The saving of the Kohl building, a steel frame office building, with reinforced concrete floors, and with metal covered trim and cement floors throughout. This was noteworthy as the first conflagration experience of this type of interior and window trim.

The characteristic feature of a conflagration is the direct attack from flame and heated gases. Nevertheless, there are places, and especially in a region of fireproof buildings, where a prevalent cause of ignition is not this general drift so much as it is sparks and brands which lodge on window sills and ignite the sash frames.

The prominent cases of successful defense of unprotected windows were the Mint and the Custom House, the first with 150 men at times and thirty windows on a side. Furthermore, both were only three-story buildings, below the drift of flame and heated gases and in addition were mainly of fireproof construction. The building whose window trim is slowly combustible has, therefore, an appreciable advantage, even with ordinary plate glass and no shutters.

Going higher in the scale of window protection, there is the case of the Western Electric Company, with its wire glass windows. These still can not be regarded as standard, inasmuch as the defect well known to fire protection engineers, namely, diathermanency, developed the anticipated effects, namely, ignition through the glass.

It was the retardent, though not positively resistant effect of the wire glass and metal frame window protection which gave the small force of two or three men a chance to take care of fifty or sixty windows and extinguish ignition fires in detail. The independent water supply also left a small residuum for buckets, which was the essential.

Had this plant not made the very natural and perhaps excusable deviation from strict factory standard in having an electric instead of a steam underwriters' pump, it might have afforded the missing data to the ability of such an equipment to resist a conflagration.

* * *

A great concrete arch will be put in by the Southern Pacific Railroad at Tunnel No 6 on the Shasta Route, near Redding, California, which caved in and forced the company to build a temporary track around it. The arch will extend the entire length of the tunnel and will take at least six weeks to complete. The Southern Pacific Railroad is now one of the largest users of concrete in the West, and several hundred thousand barrels of cement are purchased annually for use on the Pacific Coast.

Mission of San Luis Rey

To Restore Mission San Luis Rey

THE old mission, San Luis Rey, located near the Mexican line, far from the beaten track of civilization, is to be restored on a more extensive scale than any similar establishment in the historic chain that extends along the California coast. The Rev. Joseph J. O'Keefe, O. F. M., the pioneer Franciscan and one of the best known priests in California, is in charge of the work, and his plans for the preservation and improvement, when carried to completion, will undoubtedly cause the picturesque structure to rank high as a place of interest and charm.

The scope of the project is elaborate and includes the erection of a group of buildings which will form a great quadrangle. In this quadrangle the stately church, which has survived the wreck of what was once the lordliest institution in California, will form the eastern side. The western side will be 173 feet long, and the buildings on the southern and northern sides of the patio will correspond to each other. The latter structure is already nearing completion. It is 186 feet long and two stories in height. This edifice will be used as a monastery, and contains forty-five rooms, neatly plastered and well lighted. The floor of this and the other new buildings on the quadrangle will be of cement, the second story having wooden flooring. All the walls will be of adobe.

In his plans for the future, as in the work that has thus far been accomplished, Father O'Keefe is his own architect and builder. Two Franciscan lay brothers and several Mexican laborers form a small corps of assistants.

Mission San Luis Rey is in San Diego County, ninety miles south of Los Angeles. The greater part of the journey must be made via the Santa Fe Railway to Oceanside, and the remaining five miles traversed in carriage or wagon over an undulating country road. The venerable church, which has so bravely withstood the ravages of time and the elements, rears its scarred walls to the sunny sky in the midst of a picturesque valley. And here in the old days dwelt 5000 Indians.

No other mission in the whole length and breadth of California could boast of greater wealth or more romantic history than this which was dedicated to San Luis, Rey de Francia, or St. Luis, King of France. It was the eighteenth mission in the chain and constituted the connecting link between San Diego and San Juan Capistrano. It dates back 109 years, although the site was discovered ten years before that time by the first land expedition under the leadership of Governor Portola and the sainted Padre Junipero Serra.

The Education of the Public in Architecture

By JOHN BELCHER, A. R. A.

President R. I. B. A., President Seventh International Congress of Architects, London, 1906.

THE first step, as so often is the case, will be for the public to unlearn much that has been wrongly learnt. The superstitions of antiquity and the "styles" must be exploded. It must be made plain that neither a smattering of archaeology nor a superficial study of styles affords a sound basis for a critical judgment in matters of present-day architecture, which must be presented to the eyes and ears of men as a living art, founded upon past achievements, it is true, but instinct with a power and vitality of its own.

Neither is architecture merely a matter of a beautiful exterior; the importance of the "plan" of a building and of sound principles of construction must be pressed home. In other words, architecture is a science as well as an art, a blending of the two in such a way that the practical knowledge of the builder or engineer is inter-penetrated by the artistic spirit, and made without prejudice or loss to subserve its ideas.

Instruction of a positive order will range itself under the three heads of Principles, Qualities, and Factors.

The principles of architecture are two, truth and beauty.

Truth requires that a building, both in its entirety and in its several parts, should never seem to be other than it really is.

This excludes all pretence of antiquity where no such claim exists.

It requires that a church should look like a church, a town-hall like a town-hall, and a private residence like a private residence.

An external shell of plaster over brick must not present the appearance of blocks of stone, nor a steel structure cased in terra cotta suggest solid masonry.

Good architecture never deceives the eye for even a moment. There must be no false suggestion as to the purpose or construction of the building, nor any hiding under one external feature that which is usually expressed by another.

The principle of truth, however, finds its widest scope in the true use of materials.

Every material has essential characteristics of its own, and therefore a proper place and purpose in building. There is a time and a use for stone and for each kind of stone, for wood and for each kind of wood, and so on.

To defy, neglect, or misuse the natural qualities of materials is not good architecture. These natural qualities will be roughly indicated under the head of Factors.

Beauty is the second great architectural principle. Its elements do not admit of popular exposition, but the public may be trained to recognize its presence by the appeal that it makes to their imagination and emotions. The fact that beauty can be felt, but not (ordinarily) analyzed, is of importance in the education of the public, as tending to withdraw their attention from mechanical rules to the spirit that animates and pervades, like a living thing, the highest architecture.

An appreciation of beauty of form is less common than susceptibility to color effects, and needs training and development.

The qualities that distinguish good work from bad may be classed as follows:

Strength—It is not sufficient that a building be, in fact, strong and secure; it must look so; it must satisfy the eye.

The engineer may by exact mathematical calculation know that the conditions and security are amply fulfilled, but the architect has to see to it that the work presents an appearance of strength and solidity. The larger and heavier parts must be below; every arch must have sufficient abutment or even a tie-rod as well; solids when placed over voids must be strongly supported, and so on.

Methods of support and resistance must be clear and well defined.

Granite in the upper story of a half-timbered house may, as a matter of fact, be quite safe, but it seems to threaten danger; placed below, it satisfies the eye with its impression of solidity.

Vitality—Evidence of life and growth, most plainly illustrated in Gothic work, where the perpendicular lines rising heavenward and clothed (as it were) with luxuriant ornament suggests the life of a tree or plant.

It is vitality that gives fresh combinations and effects from the same primary elements.

Restraint—The limitation of means to an end, the suppression of all unnecessary parts or details.

Whatever be the nature of the building, there should be purpose, definite purpose, in every feature or ornament.

This may be illustrated under the head of Proportional Divisions (see Factors); but the general principle is one which will be readily grasped by the intelligent layman, to whom it will often suggest a line for thought and inquiry.

Refinement is impossible without restraint, but it includes also purity of form and perfection of material.

Everything must not only be the best of its kind, but so suited to its purpose that nature will seem to have expressly designed it for that use and place.

The fitness of certain materials and forms for defined purposes and effects is subject-matter for an important chapter in the education of the public.

Repose—Every really good work is clothed, as it were, in an atmosphere of repose. There is sense of power, but it is latent power; there is evidence of vitality, but it is restrained vitality.

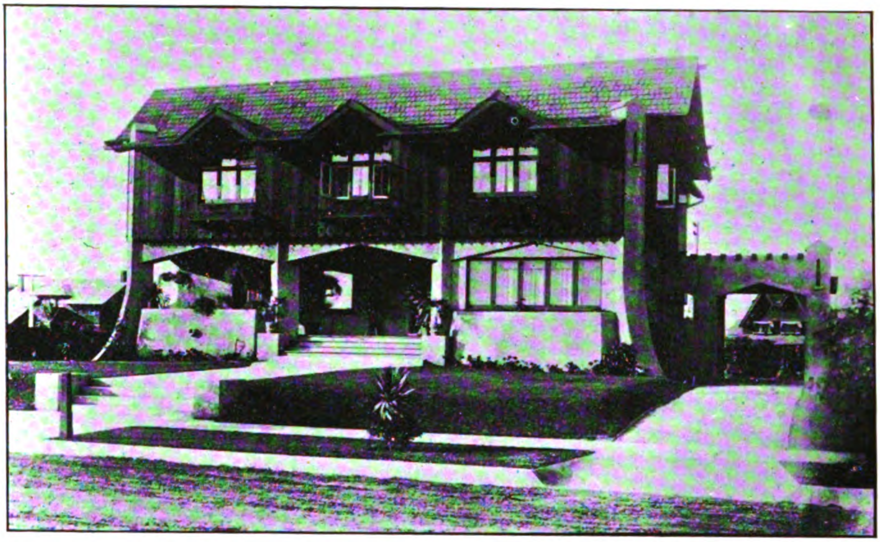
Effects too pronounced hurt the eye; ornament too profuse wearies both the eye and the emotions. There must be no "loud" or vulgar elements.

Grace—A dignified seriousness of purpose should be observed in the appearance of all public buildings, but an expression of the graceful courtesies of life should not be lacking. In domestic buildings the element of grace takes a more prominent place, and assumes a higher and more refined form, corresponding to the tender sentiments of home life.

The public interest ought to be readily roused in this direction, and a demand created for a better class of small suburban residence.

Breadth—The treatment of the subject as a whole in a simple, grand manner, the proper massing of the several parts, the subordination of detail to the larger forms of the composition and to the bringing of the whole design into unity.

An attempt may be made by illustration and comparison to explain this somewhat technical term, that the public generally may be led to understand and appreciate this quality of breadth which is so conspicuous in every great architectural work.



Residence of Mr. Alfred L. Glassell, Los Angeles
Charles F. Whittlesey, Architect

Scale—The right relation of the several parts to one another and to the whole in point of size.

It will be pointed out that there are different scales in architecture as in music, and that the varying effects upon the mind and heart are as powerful and distinct in the one case as in the other.

Also that the scale should be appropriate to the character and purpose of the building. A building of a monumental character or of great public importance should be designed and built on a large scale, and each part and every moulding should be of a proportionate size.

Factors—In dealing with factors—the means which the architect has to his hand, as it were, for the attainment of his ends—it will be necessary to emphasize the fact that most, if not all, of these factors have their origin in utility, and answer some practical need in the construction or preservation of the building.

To forget this primary purpose and use them as means of artistic embellishment is to sacrifice use and convenience to artistic ideals, and is not true architecture.

The public are quick to recognize the importance of this in respect of window and door openings, floor divisions, chimneys, etc., but are apt to think of columns, pilasters, sills, hood-mouldings, cornices, and perhaps even buttresses, as decorative rather than useful, and to suppose that the architect has a free hand in the disposition of them. Education in this matter will include instruction in the primary use of purpose of the common architectural forms, and will give an insight into the difficulty of making these forms serve the ends of use and beauty at one and the same time.

Such an insight—like propounding a problem—will go far to quicken interest.

The subject may be dealt with under the four heads of Proportion, Light and Shade, Solids and Voids, Balance and Symmetry.

Proportion—Certain proportions are pleasing to the eye, and effects of proportion are obtained by the relative size and different parts.

The various ways in which the constructional parts and features of a building may be utilized to obtain proportional divisions, both horizontal and perpendicular, might be described in detail.

Light and Shade—The advantage that may be taken of effects of light and shade might also be pointed out.

Solids and Voids—The importance of a right adjustment of solids and voids, both in respect of size and position, would come next.

How easily a false scale may be set up, and a building made to look insignificant, by broad sheets of plate glass in the windows!

Balance and Symmetry—These give a very distinctive character to a building, and aid in setting forth its special purpose. There is or can be rhythm in architecture, as in verse.

Material—The right use of the various kinds of material furnishes an interesting and useful subject for public instruction.

The general principle having been laid down that every kind of material has its special characteristics, and should be treated accordingly—in other words that its very best should be got out of it—a brief account of the natural qualities of the chief building materials (stone, wood, metal, brick, plaster, etc.) would follow.

The following leading thoughts are appended by way of illustration:

When stone and brick are used in conjunction the former should be accorded the most honorable parts—e.g.: quoins, architraves to doors and windows, sills, cornices, etc.

Granite, even if it could be carved for mouldings, should be used rather for strength and solidity than for ornamental features.

When the beauty of marble or wood is in its figure or color, it is best exhibited in the form of slabs or panels; if moulded, the forms should be large.

Stone is granular, wood fibrous: each has its appropriate forms and mouldings, suggested by the natural qualities of the material.

Wrought metal admits of the finer and more delicate forms, metal cast in moulds naturally assuming a more bulbous shape. Both kinds have their appropriate place and effective use.

Well known examples of wrought-iron and cast-iron gates and railings afford interesting illustrations.

The foregoing summary indicates the main lines along which the education of the public in matters architectural should be developed.

Whether in public lectures, or in articles published in book form, illustrations should be abundant.

There are signs of a wave of public interest in architecture which, "taken at the flood," may become permanent and lead to great results.

* * *

Little acts of kindness always come home to roost.

* * *

Even the absent-minded man seldom forgets his troubles.

* * *

The longer a man aims the more likely he is to miss the target.

* * *

Most men think it is all up with them when they are down.

Dining Room, Residence of Mr. Alfred L. Glassell, Los Angeles
Chas. F. Whittlesey, Architect

Living Room, Residence of Mr. Alfred L. Glassell, Los Angeles
Chas. F. Whittlesey, Architect

Possible Alternative Treatment of New History Building After Plans by Cunningham & Politeo
A. C. Hope, Architect

A Typical A. W. Smith Bungalow in the Santa Cruz Mountains

American Architecture as Viewed by an English Architect

By A. C. HOPE, Architect.

IN the June number of the Architect and Engineer, you, Mr. Editor, allotted me space for a short article under the above heading. Since then my condemnation of the big crowning cornice has been taken up by the Structural Engineers' Society—not from the aesthetic—but from the purely constructional standpoint.

From whatever the cause, however, imitation is the sincerest form of flattery and I beg to return their compliment, intentional or otherwise, by submitting you a sketch showing a possible alternative treatment of the front elevation, which you illustrated in your June number of the New History Building, as it might be treated by an Englishman.

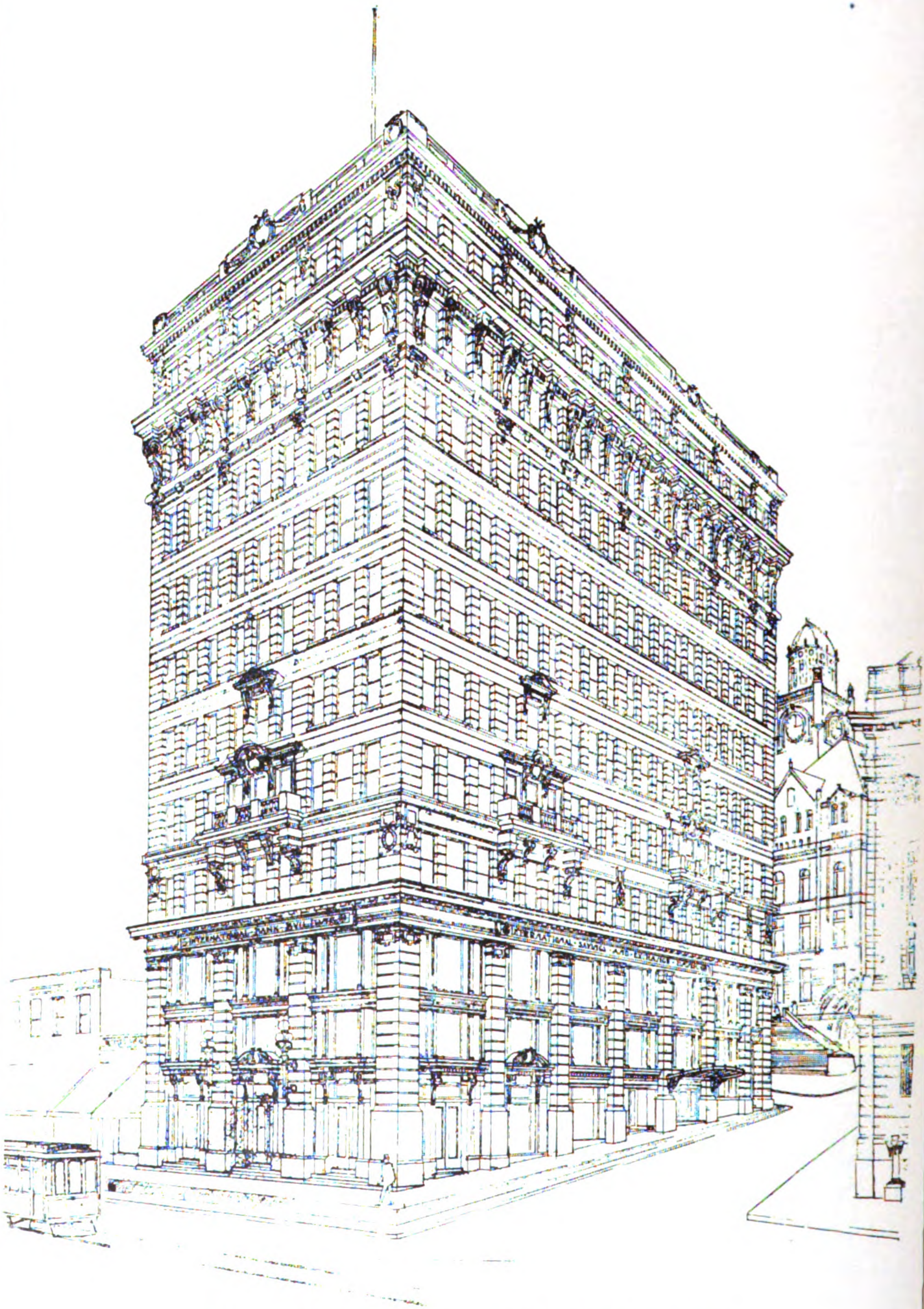
Instead of docking the cornice altogether as suggested by our friends the engineers, and thereby making the building, metaphorically speaking, like a woman without her hair, it is judiciously distributed over the whole surface (not the hair) with a little ornament on the top to break up the otherwise straight skyline.

* * *

Trying to induce some people to be thankful is a thankless task.

* * *

What a delightful old world this would be if fussy people would only lose their tempers for keeps.



International Savings and Exchange Bank Building, Los Angeles
H. Alban Reeves, Architect

Terra Cotta and Brick

New Uses for Terra Cotta Building Blocks

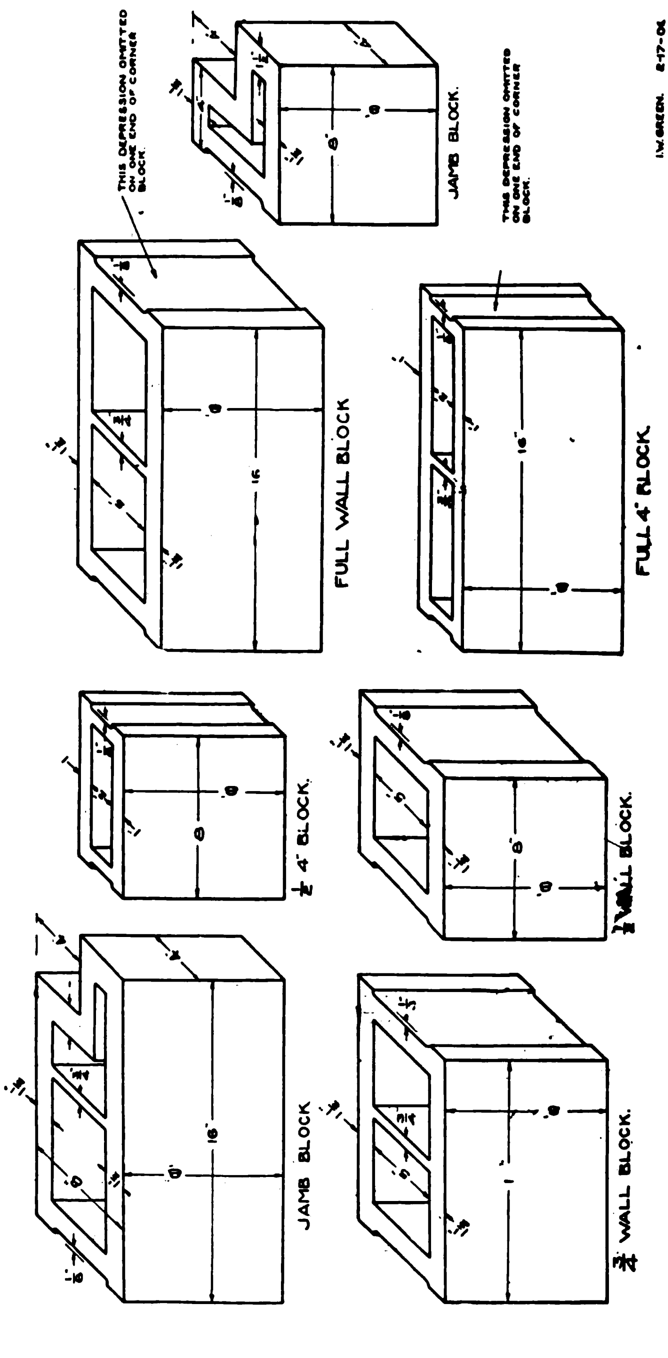
THE construction of a serviceable and artistic detached house of hollow terra cotta building blocks offers few technical problems that cannot be easily overcome; but as the details of the work are not as well understood as those pertaining to wood framing and brick construction, a description of some of the various types of blocks and their uses may prove of value.

Modern terra cotta building blocks possess advantages of great importance over nearly all other building materials. They are absolutely fireproof, resisting temperatures upward of 2500 degrees. They are lighter in weight than either bricks, stone or concrete, and are manufactured in convenient sizes for handling. A 4x8x16-inch block weighs only 20 pounds, and the larger size, 8x8x16, averages 34 pounds. A cubic foot of hollow teıra cotta blocks thus averages in weight 40 pounds, while the lightest of cinder concrete weighs 90 pounds, and stone, granite and cement blocks suitable for building purposes much more.

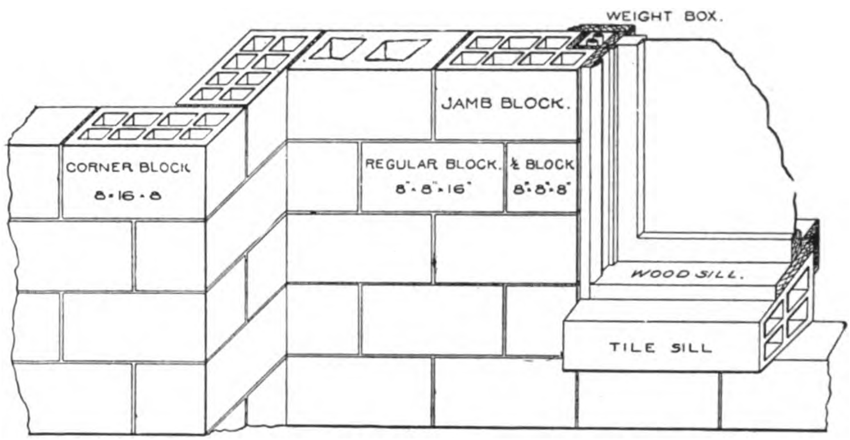
In dealing with any building material the factor of safety is one of the first that architects must consider. Hollow terra cotta blocks are made under severe fire and compression tests, and everyone therefore possesses a uniform standard of strength. Tests made with blocks 8x8x16 inches have developed an ultimate strength of 2500 pounds per square inch in center web blocks and 1969 pounds per square inch on gross area and 6000 pounds per square inch on net area in corner blocks. Thus for all building purposes they surpass in strength any possible compression they could ever be subjected to. A wall built with blocks eight inches thick would prove strong enough for any imaginable work in modern houses.

Durability, warmth and dryness to an unusual degree are obtained from walls of these blocks. They are practically indestructible and, being thoroughly vitrified, are perfect non-conductors of heat and cold and do not absorb moisture. Sound also is deadened by the air spaces in them. Walls constructed of 8-inch blocks thus possess all the desirable qualities demanded—strength, durability, fireproof, sound-proof, warmth and dryness.

The question of cost and economy of construction may appeal to some more strongly than the other qualities enumerated, but first cost, after all, is only a part of the problem. Outside of the question of first cost of material, points of economy in handling and labor must be considered. Owing to their lightness and convenient size they can be laid in a wall at less expense than stone. A single block can be placed in position in one-third the time required to set a stone of similar dimensions. There is likewise a considerable saving in lime, sand and cement, and, as



Various Types of Terra Cotta Building Blocks



ELEVATION OF
8" BUILDING BLOCK WALL.

plaster can be applied direct, lathing and furring are saved. The architect, to deal economically with this material, must have suitable variety and sizes to meet all emergencies.

The manufacturing of building materials at the factory, so that the builder has little more to do than to assemble them on the building site, is a feature of modern constructional work that saves time and delay. The great steel structures are made according to specifications at the mills, and then merely assembled rapidly and securely by the builder. The architect in designing houses of hollow tile blocks merely specifies the size and kind of blocks for each detail, and the work of assembling by the builder is simple and rapid. Wall blocks, water tables, window sills, cornice blocks, band courses, quoins and various other shapes are ready for his use in various sizes. To give variety to the building, rock-faced, tool-faced, plain and imitation stone blocks are at his command as stock material. Ornamental terra cotta made from special drawings and designs is manufactured to suit the needs of any architect. Stairways, lintels and chimneys are assembled with equal ease by means of special shapes designed to meet the requirements of each case.

The method of construction is simple, says The Brickbuilder. A few precautions for the mason should be observed. The blocks should be laid in one part of best Portland cement to five of lime mortar. The sand should be clean, good and sharp and the lime freshly burned. The joints should not exceed one-quarter inch in thickness and the blocks should be bonded so that all vertical joints are over each other. Thick or heavy joints in the wall spoil the effect and nothing is gained by them.

In the construction of a house the foundations and basement walls should be built of salt-glazed blocks in preference to others as they withstand moisture better. In the West blocks are manufactured so that the openings can be laid horizontal, but in the East the practice is to have the openings vertical, and the blocks are made with this purpose in view. The greater strength insured in the wall by laying the blocks vertically is sufficient reason why this method will eventually prevail.

The foundations are made of building blocks 8x8x16 inches, laid up in Portland cement mortar and concrete footings, with the length of the blocks forming the thickness of the walls. Rock-faced or tool-faced water-table blocks 10 inches wide, including the 2-inch wash, with a quarter-inch drip, cap the top course of the foundation blocks. The wall blocks, 8 inches thick, 8 inches high and 16 inches long, are laid on the water-table blocks, with quoins and corner blocks projecting. The walls are thus 8 inches thick and the foundations 16 inches, which insures dry cellars and floors.

Wooden floor joists are preferred in many cases to iron, owing to the difference in cost and difficulties experienced in securing structural steel work for a small house. The floor joists are laid on the wall for the first floor and secured in position by special blocks with the inside edges cut half through to accommodate the ends of the joists. These special joist blocks are made in the standard sizes and fractional lengths. The floor joists of the upper story are laid on the walls with the ends meeting the band course blocks which project beyond the building. Inside blocks, 10x4 inches, are bonded to the inside of the band course blocks and meet the joists on either end. The joists thus fit snugly in position and are held there by the blocks, giving a space of 16 inches between centers.

Special jamb blocks, window sills and lintels are manufactured. The jamb blocks have one web cut out to accommodate the jamb. The window sills are 16 inches long, 8 inches high on the inside with slope down to 5 inches. Several shapes are made and their fitting is simple. Special sizes for large windows are easily obtained on order. The window quoins are made plain, rock faced or tooled, and the lintels of doors and windows are formed of special lintel blocks laid up in the ordinary flat arch system.

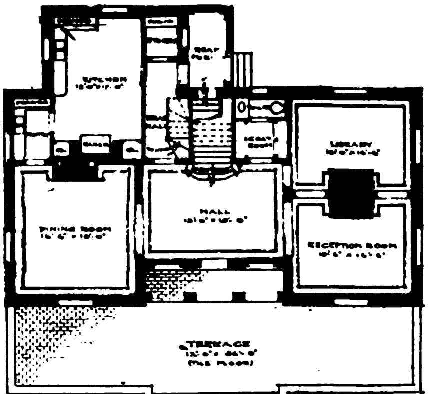
The walls are carried to the cornice in the usual style of stone buildings. Ornamental cornice tiles are fitted to the top course, giving a projection of 5 inches. The cornice tiles are curved, fluted or rounded as desired. The lower part of the blocks fit snugly to the upper course of wall blocks, and this modest projection gives beauty and symmetry to the structure. The roof rafters are laid on the wall blocks in the same manner as the lower floor joists, or they may be used in connection with special cornice blocks with the inside web cut out to make room for the ends.

The framing of the roof is made in the ordinary way and shingled or tiled as desired. If wooden porches are used openings should be left in the walls for the porch beams. The latter rest directly on the walls. By using fractional sizes of blocks these openings can readily be made as desired. These blocks, however, are as easily cut and broken as bricks, and any desired change can be made without difficulty. In every respect they are as simply handled as bricks.

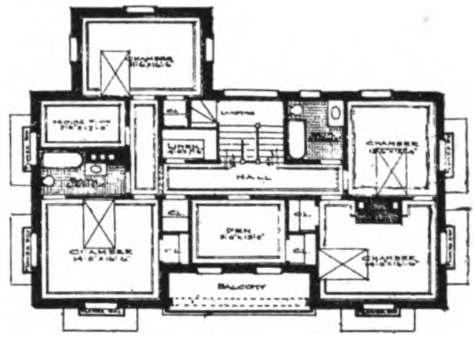
The inside of the blocks are scored to receive the plaster, and no furring is necessary. The outside may be plain, in matched colors or with glazed or tooled surfaces. Where stucco work is desired outside, no matching of colors is necessary.

Chimney blocks are made with air spaces surrounding the flue, which in no way interfere with the draught. A fire starting in a chimney so built could not possibly injure woodwork or even paper which comes in contact with the outside. The total weight of such a chimney is about one-half that of one built of brick, thus requiring lighter foundations and footings. Ornamental chimney caps of terra cotta tiles may be had for finish. These chimney blocks are 14x14 inches, with a space of 8x8 inches for the flue.

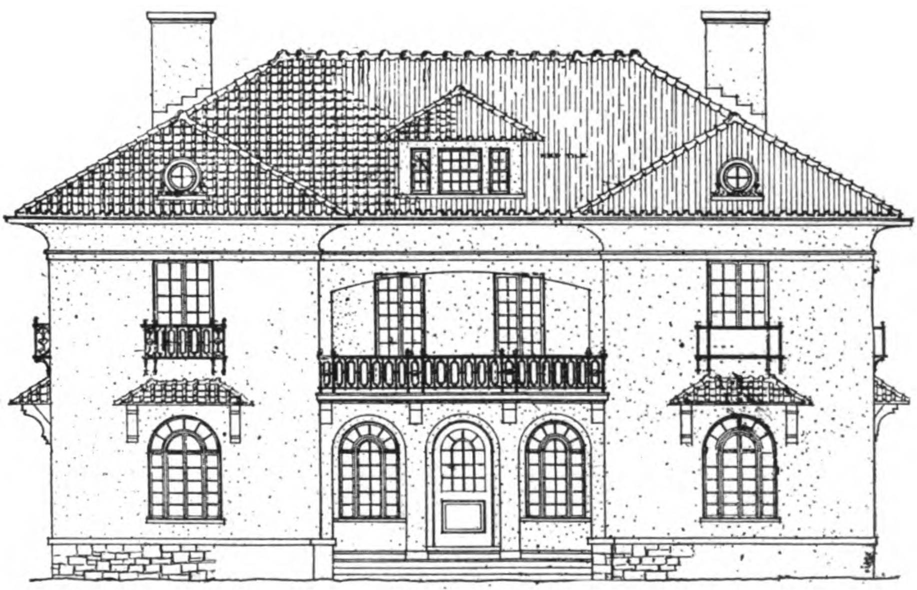
The cost of a simple yet artistic house of this description, built with 8-inch terra cotta walls, 16-inch foundation courses, with wooden porches, floors and wood framing and sheathing for the roofs, would be about



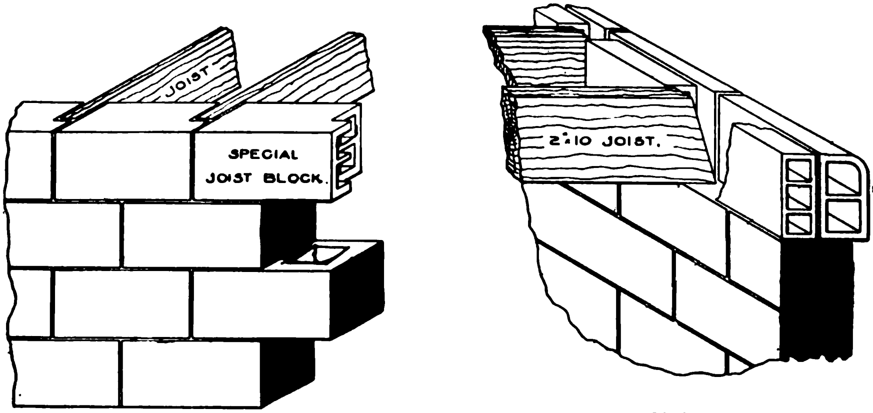
FIRST FLOOR PLAN.
Scale 1/8" = 1'-0"



SECOND FLOOR PLAN.
Scale 1/8" = 1'-0"



Design for a House to be Built of Terra Cotta Blocks. Walls Rough Cast
Elliot W. Hazzard, Architect



WITHOUT BAND COURSE

WITH BAND COURSE

METHOD OF SUPPORTING FLOOR JOISTS.

20 cents per cubic foot of total contents; or, if the interior finish and equipment are made less elaborate, the cost may be scaled down to 18 or 19 cents.

A terra cotta hollow tile house, veneered with pressed brick, gives a good finish and provides one of the most substantial houses ever devised.

* * *

Quality of Cement Blocks in Collapsed Building

Architects and builders the country over will be interested in the Government's report on the quality of the cement blocks used in the recently collapsed concrete building at South Framingham, Mass. Tests made from a large number of blocks taken at random from the ruins showed they had a crushing strength of from 63,000 to 130,000 pounds each, according to the size of the block. As further investigation progresses the idea that the cement blocks in themselves were at fault is generally being abandoned, and two probable causes are now assigned, although the official investigation is not at this writing completed. One possible cause is that there was an underlying strata of quicksand beneath the foundations which gave way from the weight of the concrete floors and roof. Another reason assigned is that the steel skeleton frame, which bore a large part ot the load, was figured too light, and with the weight of the concrete roof, much too heavy it is intimated, buckled, tearing down the walls in its fall. Perhaps the full official investigation may disclose other reasons for the collapse, but in the opinions of those qualified to judge it will be found that concrete construction, as such, was in no wise responsible for the wreck which caused the loss of life.

* * *

Men dislike to blame themselves for their own faults, so they blame women for theirs.

Side View of the New Hotel Blenheim

The Hotel Blenheim---A New Type of Construction

THE one thought which should be kept in mind in designing a hotel is that the construction be of a type which meets every requirement and condition of a truly fire-proof building, writes J. Fletcher Street in the Brickbuilder. In the Blenheim, erected at Atlantic City, N. J., the architects have given due consideration to this most vital and important point, and have studied it both in the light of their own experience and by the results of severe and practical tests so recently imposed upon fire-proof and so-called fire-proof structures.

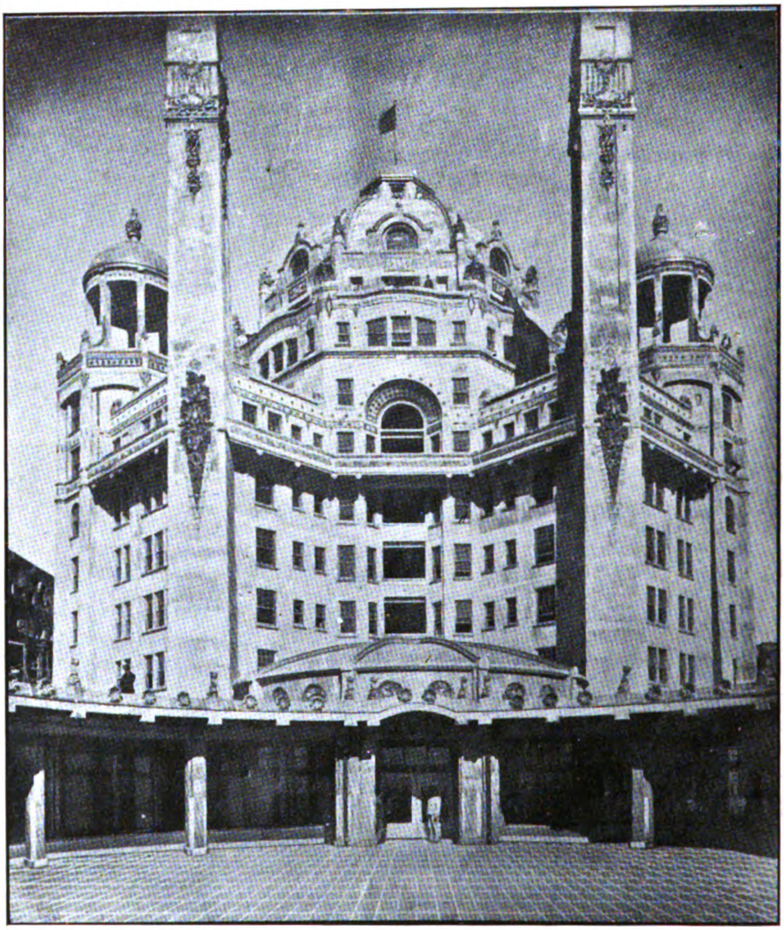
The building is about 600 feet long, 125 feet wide, eight stories high, with a dome equal to twelve stories in height. It was started on June 12, 1905, and was practically completed, ready for finishing and furnishing, on December 1, 1905.

A time limit for the completion of the building having been imposed, it was thought advisable not to take chances with the uncertain conditions of the steel market, as former experiences had shown that much serious delay frequently results from this source. Another and perhaps one of the strongest objections to the use of structural steel was the noise that would result in the assembling of members and in the driving of rivets. As this would be a disturbing element to the guest of the Marlborough, an adjacent hotel and one under the same management, a construction thoroughly practical, and yet one that could be carried forward with the least possible delay and in the quietest manner, needed to be decided upon.

Estimates were obtained for steel, fire-proofed with hollow tile, and an armored concrete and tile construction. Not only was the latter system cheaper, but it was the only type which could be guaranteed, under a heavy penalty, to be completed within the specified time.

The contract price for the clay tile and concrete construction—the one adopted—was $126,000, while the lowest bid for the steel and tile construction was $220,000. The steel necessary for the latter constructon could not have been had under four months, whereas work was immediately begun with the system adopted and carried on at the rate of about a floor per week.

The significant feature of the construction is the introduction of hollow tile in combination with the concrete floor slab. The exterior walls are built entirely of hollow tile, the floors being of long span hollow tile construction,



The New Hotel Blenheim, Atlantic City, N. J. Price & McLanahan, Architects

reinforced with steel bars, and reinforced columns and girders of concrete. Twelve-inch terra cotta tiles, varying in depth according to span, were placed between the lines of concrete joists, which had a uniform width of four inches.

Besides greatly lightening the construction, this system has the advantage of giving a dryer floor and one more nearly sound-proof. But the remarkable distinction is realized in the shorter time occupied in erection over that consumed by any system where a solid concrete slab is used.

The structure in itself is virtually monolithic. With a foundation of piles it rises from floor to floor by means of solid concrete piers regularly diminishing in size as they ascend. Into these are framed the necessary girders and beams for supporting floor joists and outside walls. All walls are curtain walls and are carried at each floor level by their respective girders. This gives the great advantage of permitting work to be advanced at any number of story levels at the same time.

The building as an architectural achievement is most interesting, the design being influenced somewhat by ancient types of Spanish and Mexican work. In the treatment of the exterior the true character of the construction has been frankly confessed. The walls are coated with a gray cement, the dullness of which is relieved by a liberal use of colored tiles in friezes, spandrels and panels. The designs are simple and almost entirely geometric in character, and in only a few instances has the desired effect been sought in a pictorial way.

Cement and Concrete

Concrete Finish---Veneer Anchorage

By WM. B. GESTER, C. E.

THE confidence in Portland cement concrete as a building material, has become firmly established throughout the world. The increase in its use, is so marked, as to have become subject matter for special comment, not only in technical publications, but in newspapers and magazines of the ordinary general type. It has ceased to be a wonder, and its status is accepted now, even by those who, for not very good business reasons, long fought bitterly, and frequently most unfairly against its inevitable growth in favor and use.

The discovery that changes in temperature have approximately identical effects as regards expansion and contraction upon concrete and steel, should be considered as of almost equal value with the discovery of the modern processes of steel making. It has rendered possible a kind of construction, which, although only in its infancy and not generally well understood by the mass of builders, and sufficiently understood by only a few, has nevertheless become forced into prominence by reason of its own wonderful inherent qualities of strength and economy.

As a knowledge of sound ferro-concrete construction methods becomes known, and when the results of experience with the various "systems" now in use, have enabled engineers to formulate a reliable general codification of the laws governing the use of the double material, we shall undoubtedly see this use still further increase.

As it is, however, hundreds of buildings are being planned, and constructed, either of straight reinforced concrete, or with steel frames and ferro-concrete walls. San Francisco is to have her full share of these classes of work.

The ordinary concrete such as must be used to form the body of the walls, does not possess a very beautiful surface. It is unfit to serve as facing for any building possessing architectural pretension, and recourse must be had to veneer of brick or stone, or a surfacing of plaster, or a facing of extra fine concrete must be laid up at the same time, and become incorporated with the ordinary concrete of the body of the wall, and finished by hand after the removal of the forms.

Some work of the latter kind has been done in the East and in Europe. It is much more available for plain surfaces than for architectural ornament. The expense of accurately cutting the latter, even in comparatively soft material from the scaffold, is excessive. Extreme care also is required in placing and ramming the two bodies of concrete together in the forms, and this undoubtedly complicates an operation which because of the necessity for continuous work until completion, is already sufficiently delicate and difficult.

The brick or terra cotta or stone veneer and trim, may be so bonded and anchored that they will remain in place in spite of even such severe conditions as obtained during our April quaking, and they do fill architectural requirements.

There is no doubt that architects will specify a stronger anchorage than they ever have done before, and there is no doubt of the wisdom of so doing. An example of thoroughly safe practice in this regard, may be seen in the type of anchor, specified by the architects, and used in tying to the backing, the "Roman Stone" facing on the basement walls of the Fairmont Hotel. The stones are unusually large, averaging 36 inches by 18 inches in area, and being 4 inches thick. Each of these blocks is channeled to hold two steel anchors, having a cross section of 1"x½", and to be imbedded 12" into the wall. These are formidable ties, and may to many seem heavier than necessary, but there is no doubt of their sufficiency, and their specification indicates the tendency to secure safe anchorage.

* * *

The Concrete Block Industry of the Future as Indicated by the Past

By A. P. MELTON.

IN all lines of business depending upon or affected by manufacture of concrete blocks, no topic is of greater interest than the probable future of this industry. The manufacturer of machines would like to know the chances for continued activity along his part of the business. The manufacturer of blocks is concerned as to whether he should make up a large stock or make up material as ordered, while the clay-brick man has an excellent reason to worry as to what course he should take. Why should there be any skepticism? Concrete has for years been recognized by, and specified by the foremost engineers and architects for nearly every part of buildings from the concrete footings to the concrete roof. The foundations, the columns, the beams, the floors, the fireproofing, the ornamental work, the roof, the sidewalks around the building, and even the sewers may be made of concrete, and all to be pronounced perfectly successful by experts. Yet in the face of the apparently indisputable evidence as to the quality of concrete, we hear of many who would like to build out of blocks, but are afraid to take the chance, having seen or heard of buildings that were not satisfactory. The manufacturer of blocks often says that the architects and engineers are down on the product and will not specify it. Then we have the manufacturers of rival building materials, who, of course, use any failures, in concrete block construction as examples to show the superiority of their material. Why all this skepticism? Why do we hear that architects and engineers do not favor the block?

Why do manufacturers of rival materials even have a chance to refer to any failures in concrete block construction? Who is to blame

*Paper read at the Northwest Cement Products Convention, Minneapolis.

for all this? Who are the real enemies of the concrete block? The causes of all the above troubles can be traced to whom? The answer is, First: Some of the manufacturers of block machines, and—Second: Some of the manufacturers of blocks.

About two years ago, when the block began to become prominent, machines of various types were put on the market, some of which, to one who is accustomed to designing machinery of this character, or to one who is familiar with concrete, were entirely impractical through faulty design, proportion, strength and utility. Yet hundreds of these nondescript machines, if they can be called machines, were sold throughout the country. (I have had a good deal of experience in designing machinery of this kind, and always take great interest in the design and proportions of the parts, and am glad to note improvements by many of the progressive manufacturers; also to note that some of the hopeless ones have given it up since the conventions of last year.) But while these poorly constructed machines cannot turn out a perfect product, and consequently any building put up from these blocks will hurt the business, more or less, the injury is not necessarily lasting, as, if the blocks are hard and sound, it is easy to show that the fault is only in the workmanship.

The greatest evils we have to contend with are the results of mistakes that have been made, and false impressions due to these mistakes. For instance: When this industry was in its infancy, a great many of the block machine men advocated mixtures as lean as one to ten, and very few talked any richer than one to five. As the business was new most of the buyers of machines followed out the instructions given with their machines as the only guide then to be had, with results disastrous in many cases and unsatisfactory to say the least. Hundreds of houses and thousands of foundations have been built of blocks made from these one to five and one to ten mixtures, and were it not for the redeeming fact that a greater number have been built of properly proportioned concrete, the business would now be in a bad way indeed. As it is we have great odds to work against in introducing the material. Bad reports spread faster than good ones. Another feature of this method of making blocks is the fact that the market price of blocks in many localities has been made too low, and the block men find it necessary to raise their prices if they make and take care of their product properly, a thing easier said than done.

We hear that the engineer and architect are not favorable to blocks. This I do not think is true, except in isolated cases. The future success of the engineer and architect in their respective professions depends upon the reputation which they are able to make and maintain. They have to be conservative in making recommendations, or specifying materials, as the layman looks to them as an authority and spends his money according to their suggestions. An engineer cannot recommend material off hand, but in concrete, especially, must know the proportions and quality of ingredients before he can act. Taking these facts into consideration, and the fact that the makers of some machines advocate poor mixtures and the fact that the blocks are actually made of mixtures varying from one to five to one to ten, at the suggestion of the machine man, there is little wonder that the engineer and architect don't favor or want anything to do with the work. Another fact is that many machines are not complete enough to make the different blocks which an architect would require in a building, making it necessary, of course, for him to use some other material. Another result of this ill-advised policy is the code of building ordinances covering the use of concrete blocks, and limiting them to very small bounds indeed. In concrete blocks actually tested the average crushing strength was sufficient to support a column of blocks over 2000 feet high, yet we have ordinances in different cities limiting the height of block buildings to three stories or less. In view of the fact that the block men have in so many cases been trained to make an inferior product by the very people who should insist on the best, and that it is impossible to inspect all the blocks during the making and curing process, we cannot call such ordinances unjust. Where the proper standard is maintained in concrete blocks there can be no prejudice, and liberal revision of ordinances can easily be procured.

This rather lengthy discussion of the demerits of the concrete block is not intended as a wet blanket to the business, for no one is a greater optimist than myself as to the future of this industry, but we who are interested must admit that a bad start has been made by many machine men, in trying to make the thing look too good. We must admit our faults and mistakes and must rectify them if we expect to remain in this business in the future.

I have been collecting data from cement block manufacturers and upon comparison find that the larger plants, employing five or more men, manufacture blocks much more cheaply than those employing only a small force, the cost of labor being almost double in many small plants. These larger plants go into this work as a business, and have necessary machinery and equipment, and usually handle other lines of cement work as well. The time is coming when the wood-shed block plant will be extinct. It will go the way of the little road-side clay-brick plants that used to be found almost anywhere. The block plant of the future must have more than enough face plates to make a few abominable looking rock-face designs. The block machine companies must be able to furnish many special designs and blocks, and the foreman of the block plant must understand thoroughly what he is about, and be able to devise special molds for many blocks that will be specified.

Any business as important as the building business must have capital behind it, and it must be run on business principles, be large enough to have a regular system of operation, and have a man superintend who understands cement. This has been the history of every industry, the steel, oil, farm, implement, lumber and many other lines have at one time been operated in a small way, but system and concentration of capital and large plants have proved a source of great economy. Hence a few years will see the cement block industry in each community all under one or two heads, instead of a dozen or so wood-shed or basement plants. Another system which will be possible when the business reaches this stage, is that inspection will be possible by a state or other official similar to the pure food, or the scale inspection, and the man who tries to skin on his cement or workmanship will go the way of the man who works his pump over time in connection with the dairy, or the grocer who tampers with his scales.

If an inspection of this character could be enforced there would, no doubt, be a marked change in the quality of the work. If we would all advocate a mixture of not poorer than one to three in the future, we would be making another great step in the progress of the concrete block industry. If we could all have our block actually made of a one-to-three mixture, and properly cured, we would have very little complaint.

We will have these conditions in a very short time, but we must at every chance preach better mixtures, better systems of curing, better equipment, economy in labor and handling materials and a better price for the resulting superior product. Five years from now will see a model plant in every community large enough to support it.

Heating, Lighting and Electrical Work

The Adaptability of Various Art Classifications to Lighting Fixture Designing

By CARL E. ROESCH.

THE conveniences of the present day with which our daily life is surrounded, become so fixed in our minds that we give but little thought to their origin or the various stages through which they have struggled to attain their present degree of usefulness.

This is particularly true of the modern methods of lighting, where the mere pressing of a button or the turning of a key accomplishes for us a result which was at one time only possible through the expenditure of much time and effort, and we are thus relieved of the necessity of dwelling upon the thought as to why and how this should be so.

In a previous article in this magazine, the writer devoted some space to an explanation of the early history of the various kinds of light, the first instances of the use of gas, etc. The purpose of this paper, however, will be to dwell rather upon the origin of the various devices to convey in practical form the different light factors, than to treat of the history of these factors. In this connection it is of interest to quote from an article by G. Alfred Pearce, which appeared in one of the recent technical journals, in which he says in part:

"The first electric lighting fixtures for incandescent lamps were made by William Pearce, Boston, Massachusets, to the order of George Peabody, the great banker and philanthropist. The motif was a free treatment of stalks of Indian corn and running pumpkin vines. Twenty-six lights were set in sockets fashioned like the stems of ears of corn. The bulbs were of moulded glass made to show kernels, and the sockets had leaves of sheet brass, hammered to the likeness of corn husks. The twenty-six lights symbolized the then twenty-six States of the Federal Union. This candelabra was about twelve feet high and was finished in ormolu. The object of its manufacture was to enable George Peabody to use it in his office for the purpose of enlisting capital in floating the electrical lighting inventions of J. W. Starr of Cincinnati, Ohio. The candelabra was afterward taken to London where Michael Faraday saw it and made it the subject of a letter."

From the above one can readily see how the designers grasped at the freedom of line and position of illuminant source, offered by the electric light over gas, which at that time could be placed only in an upright position. This sudden release from the bondage prescribed by the limited artistic possibilities of gas lighting instruments, gave to fixture designing a new impetus which has lead through various degrees of perfection, up to the present high standard of this branch of decorative art, as is exemplified in the lighting of such interesting buildings as the New York Yacht Club, the Astor and Belmont Hotels.

In designing things of a purely ornamental nature, such as jewelry the artist need give no thought to anything but the beauty of line, while a designer of lighting fixtures must keep in mind the very essential one of practicability, both as to construction and utility, and combine therewith originality and beauty. To accomplish this he may work toward either of two ends; the one in which he incorporates the recognized architectural values, or the other in which he employs floral motifs.

The lighting of the new Federal Building in Chicago offers some excellent illustrations of the artistic possibilities of classic design. Perhaps this unusually good result was due to the fact that a competition was held among the designers of the most successful and competent fixture manufacturers in the country.

The ready application of various forms of plant life, at once suggested itself, and was immediately developed, giving rise to the designs executed in "Art Nouveau," where this form reached its highest degree of perfection. The fundamental motif of this school of art appears to be a use of the graceful curves found in vegetation, particularly that of tropical and aquatic origin, and a more or less faithful adherence to nature in the use of these curves rather than their reduction to conventional forms. In Europe, where the idea originated, it has many ardent advocates, but here at home it has never been able to fix itself permanently into our decorative field, even through the efforts of various prominent architects and decorators, who, by occasional revivals, have attempted to graft upon us permanently this style which bases its claim for recognition more upon its originality than its practicability.

It will be seen that the designer's originality of execution will be governed by his versatility in applying the traditional architectural forms and assembling them in artistic mass, or when striving for a florid or festive treatment to employ the more flowing lines made possible by the use of floral or fruit motifs, and by this we do not necessarily mean "Art Nouveau" for the beauty of the various Louis periods in French decoration, or the inspiring dignity of Italian detail is infinitely superior to the excessive ornament usually found in the so-called examples of "new art."

Originality is a most commendable thing, but ornamentation hardly deserves to live on this alone, and when it does not show its purpose clearly and tell a true story, it were better to adhere to the traditional forms where merit has stood the test of ages of criticism, even if it be a slavish adherence to some school or period, for deception or a lie can never be the foundation of true art.

* * *

Possibly the exact origin of "flat," as applied to an apartment, will forever remain in obscurity. In recent years owners of "flat houses" in some cities have rebelled against the term most hotly. A short time ago a tenant was threatened with a suit for libel because he persisted in saying that he lived in such-an-such a flat house. The landlord declared that the structure was neither a flat house nor a tenement, but an apartment house. The repeated use of "flat house" as a designation tended to lower the reputation of the place and drove away would-be occupants. In some cities the word flat, however, carries quite the opposite significance.

The Paint and Painting Question

By H. T. JAMES, Manager of the Bass-Hueter Paint Co.

AS a rule too little attention is given to the all important point of painting the interior and exterior of buildings. The architect specifies good material and leaves the balance to the contractor, who frequently endeavors to economize from the very start byusing cheap material for the priming coat, or the foundation as it were, which is just as important as a good foundation to the building. Pure material is the beginning, the middle and the end of the right kind of paint; the kind that is safe to use for priming, second and third coating; the kind that preserves and protects, and when the time arrives for the re-painting, leaves your building in the proper condition without the necessity and expense of burning and cleaning off the old material that remains.

Paints made from pure materials are not cheap, but the first cost should not be considered. They do not enter into competition with the cheap kind! There is no common ground. Either a paint is good for building, or it is not. The cost of application is the same in either case, but they differ in this: the first cost of pure paint is more than the adulterated, or poor, but the lasting quality, or result saves the difference many times.

Good paint is sometimes condemned for various reasons, such as using it over poor lumber containing moisture or sap; soot or grease; the using of a cheap priming coat of Ochre, or some non-drying paint; or the using of a priming coat containing linseed oil substitutes.

There is no secret in producing good paints, although there are many formulas, and many materials used in manufacturing the various grades on the market. The manufacturers and producers of pure carbonate of lead claim the base of all paint should be entirely of lead; zinc manufacturers claim the base should be entirely of zinc. As a matter of fact, the best results are obtained by using a base consisting of pure carbonate of lead and the proper percentage of zinc. When this is used in connection with linseed oil, the proper percentage of turpentine and driers satisfactory results will be assured.

In producing color combinations, or tints, only strictly pure colors should be used, and when possible permanent ones. It is false economy to use adulterated colors, or to paint over old material that is peeling, scaling or cracking.

Too little attention is given to re-painting of old work that is in good condition, and does not require burning off. Buildings in this condition need a larger percentage of oil for the priming coat, and where they frequently require three coats, they are given two heavy coats, in order to cover and make a solid finish, in place of giving three thin coats and supplying the worn and dried surfaces with a proper percentage of linseed oil, which is really the life of the paint.

An important point is the matter of puttying, particularly on new work. Few of the contractors use pure putty, and more or less difficulty is continually experienced from the use of adulterated putty.

* * *

Gas from cocoanuts is the latest illuminant. The coal of the Philippines has been found unsuitable for gas making purposes. The government, therefore, has been experimenting in the laboratories, and has found that a gas of great illuminating power may be produced by a very simple method from cocoanut oil.

San Francisco Architectural Club Celebrates Anniversary

By C. E. ROESCH.

TO devise new and original stunts for the celebration of anniversaries is an art which few of us are equal to, but our organization is fortunate in numbering among its members several just such individuals whose resourcefulness and ingenuity brought forth an entertainment on the 29th of September which made the fifth anniversary of the club one of the most delightful events in its history.

The following is the cast of a little travesty on "Work" written by Mr. A. O. Johnson, the "Clyde Fitch" of the Pacific Coast, who successfully injected into his lines bits of local color and "gags" relating to the architectural profession, which were highly appreciated, even by those who were made to suffer thereby, at the hands of our celebrated comedian Mr. C. A. Newbauer. Mr. Newbauer's cleverness in comedy roles, together with his excellent tenor voice, is likely to take him from the drawing board to "treading the boards" (or ties) to whch he is no stranger, having done some little quartette work professionally in the past:

Mr. A. Overton Johnson's travesty on Work entitled: "Skinner Skinned," or, "Three Acts in Thirty Minutes." Cast:

A-dam Skinner..The Author
A "reinforced commission" Architect
Dr. A-L-L Curer..Carl E. Roesch
Mrs. Cox..Miss Harlae Corwin
Gladys Softleigh, "The Fiancee"..Miss Charlae Archer
and
A. LAZY TOOTHPICK..CLARENCE A. NEWBAUER
THE REAL BOSS

Otherwise there will appear tangled up with the play, artists and entertainers of such repute that they need no introduction to you. The invitation has been tendered them to—

"Go ahead and do your worst"

SCENES

Act. I. The offices of A-dam Skinner. Act. II. The same.
Act. III. And still the same.

PROPERTIES: Havens and Toepke "down stairs"

COSTUMES: Our friends and their sisters.

SCENERY: 'Twould be a shame to tell you.

LIGHTS: The candle maker. Stage Manager, George Wagner.

One must take the degree of appreciation shown by the audience as a criterion of the success of our efforts, and inasmuch as no violence was indulged in, it is fair to assume that the entire cast, individually and collectively, portrayed their various parts as befitted them. Much credit should go to the stage manager, and those who, from similar experience, can form some idea of the degree of work there is involved in bringing to some state of perfection a bunch of raw theatrical material, will bestow ungrudgingly upon Mr. Wagner the reward he so richly deserves.

During the intermissions we were entertained with musical selections, the singing of the Hawaiian airs with stringed accompaniment being especially appreciated, and at the conclusion of the intellectual repast, the "material" man was provided for in the banquet rooms by Monsieur Albin and his able assistants, where tastefully arranged the supper awaited our pleasure.

Again the resourcefulness of the club's membership was in evidence in the conception and execution of our "International" spread, each course being characteristic of some nation, and as the course was served a large phonograph played the national air of that country.

The customary speeches and congratulatory remarks were indulged in, the evening terminating with the usual stories and antidotes permissable at a stag affair. A lingering "goodnight" over the "small black" and cigars, the members dispersing, and another successful year was placed to the credit of the S. F. A. C.

* * *

AT the regular monthly meeting held October third, the customary business as to membership, etc., was gone through with and the reports of the various committees were read and reported upon. When new business was in order announcement was made that the Architect and Engineer proposed to offer another prize competition for a new cover design for their publication, to be awarded along the same lines as the previous competition. This is open to all club members and as there is no special time limit, this should bring forth some interesting results.

The Steel Class, through its secretary, Mr. James McGee, made its presentation of a handsome bookcase to their instructor, Mr. Chas. F. Archer, who in turn, presented it to the club.

Mr. Schmidlin's resignation as secretary was read, to take effect November 7th. Mr. Schmidlin desires to make certain preparations before going on an extended educational trip, and asked to be relieved of the detail of his important office which he has filled so creditably the past year.

Several of the members are preparing a sketch and heading to be used in this publication to head the club department news which will appear each month.

* * *

Do Fashions Follow Architectural Whims?

IN previous ages the dress of a people resembled, to a wonderful extent, the architecture of their time. When the style was along artistic lines in building, the same might be seen in the clothing of the people. —Mrs. B. F. Howard to Chicago Dresamkers' Club.

If in other ages fashions followed architectural whims, isn't it as sure as shootin' that today we dress our limbs in a style originating in the things we daily see? Doesn't this account for fashions—save the ones from gay Paree? Asks a Chicago contemporary.

See this man and his "bay window,"
  Ain't our supposition so?
Got it 'way back in the eighties,
  When his style was all the go.

See this old, bald-headed party, with the smooth, well rounded dome around you, right at home. Don't it match the big postoffice? See the lads with baggy coats. Where did they get their idea? Why, that's easy. Sailing boats.

Why do men wear two small buttons on the back of a cutaway, useless as a man's appendix vermiformis? Tell us, pray! Isn't it because they copy—rather than invent, instead—modern architecture, which is full of frills and gingerbread?

Talking, now, about ideas,
  Here is one you should not shirk:
Wasn't the peek-a-boo suggested
  By the open lattice work?

Interior Decoration

New Style Mission Wall Papers

MISSION has undoubtedly arrived. By this we mean to say that, from being a special and peculiar form of decoration, it has been elevated by public acceptance to all the dignity of a decorative style. In other words, instead of partaking somewhat of the nature of an iconoclastic, idol-breaking innovation, it is recognized for its beauties of simplicity and strength and adopted in most of our homes without receiving criticism or special notice, as it would have received a few years ago.

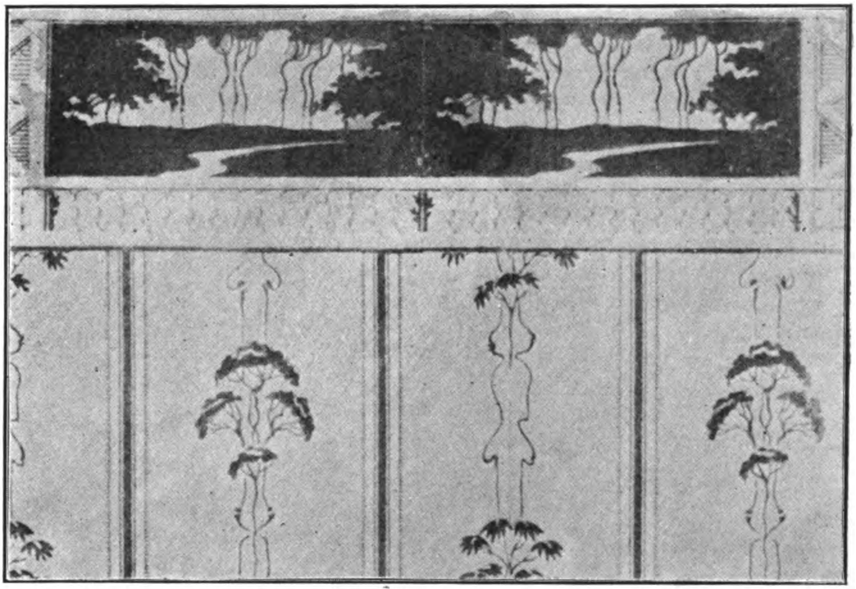
One of the reasons for the more general acceptance of Mission style, lies in the recognition of its defects, which were early seen by its sponsors. The early forms of Mission were rude and clumsy; the curved elements of furniture design were considered anathema; and Mission was something in dark oak that it were well to use very sparingly, indeed, if used at all in a home.

But, by and by, the designers found that a little bit of curvature introduced into the lines of a chair made the straight-edged parts of the chair look all the better for the contrast. They also found that it was possible to make a table without using the trunks of four oak trees as the legs for the piece And again, they discovered that ornament was a fairly good element in furniture design, especially if ornament were used rightly, which means sparingly.

So, all these things having been done by the furniture designers, Mission developed into a real style—not a mere fad in decoration—that "worked" for dining-rooms as well as dens; for bed-chambers as well as for billiard-rooms. And while the furniture was developing, the wall decorators were preparing their innings. Burlap in glaring red was found excellent for the room in dark oak paneling, because something had to be done to pierce the gloom of wood and wainscoting.

Therefore, the paper makers took thought, and decided that dark-oak paneling was really not any more necessary in a Mission room than in a Colonial interior. So, they said, "Let us cut the wainscoting and paneling out of the problem, and proceed as though there were no necessity of a wainscoting in Mission style."

In carrying out their ideas, they prepared charmingly simple designs to conform to the best features of Mission style. These designs recognized also the straightline elements which are always to be found in Mission furniture. And to avoid the scarlets and bright greens of the usual textile wall-coverings, colors made necessary by the mass of dark wood in the wall paneling, they simply substituted pretty grays, creams, pale tints, and even white. These, they found, could be very successfully used with the Mission



The Mission Wall Paper

furniture, and that Mission looked very well in rooms without anything in the way of wainscoting, provided such papers were used as had designs in decorative sympathy with the furniture.

The illustration is interesting as showing the latest development of these new-style Mission wall papers. As will be seen, the background is light in tone, and the wall is capped by a sectional landscape frieze, which gives blue and green in masses, interspersed with white between the sections, as they hang on the wall. The straight-line features of Mission furniture are recognized in the vertical stripe of the paper, and also in the convenionalized natural form of the pattern between the vertical lines. The straight and rigid erectness of the lines is helped out by the plant motif in the panels, and the furniture set against the wall which happens to be decorated with paper of this type is made more attractive because the straight elements in the paper pattern subdue the straight elements in the chair or table and accentuate the curved parts of the piece. As to color effect, the pieces in dark wood are in contrast with the wall against which they stand, and are not merged with the wall, as they would be in the case of a paneled room.

The best result of all, however, in using the new Mission wall-paper, is the general improvement it gives the interior. It lightens it up. It makes the whole ensemble more livable and every-day-like. The Mission woods have an opportunity of being seen in full light, and instead of being black, or nearly so, they show pretty brown and chocolate shades, with the texture of the wood reflectng the light here and there under the low-polish of the wax finish. The new papers for Mission style bring the style nearer to every-day use than ever before—The Ideal House.

* * *

A little girl was out walking with her aunt one day. The aunt bowed to a man they were passing. "Who is he, Aunt Jennie?" asked the little girl. Mrs. Littlefield told her that he was Mr. Melrose, the village undertaker. "Oh, yes," replied the child quickly, "I remember him. He undertook my grandmother."—Harper's Bazar.

Floral Upper Thirds

THE floral upper-third form of wall decoration is one of the most pleasing effects which may be obtained in a modern interior. There are several places where it is appropriate; halls, living-rooms, dining-rooms with wainscoting, and even in Arts and Crafts rooms where it is not usually found. The essential basis for an upper-third treatment is that the greater part of the wall be in a flat color, or in a simple, plain wainscoting. The upper third in natural or conventionalized flower pattern sets off and relieves the plain portion of the wall below, not only by a contrast in color but also by the free lines of the design in contrast with the rigid lines of the room moldings.

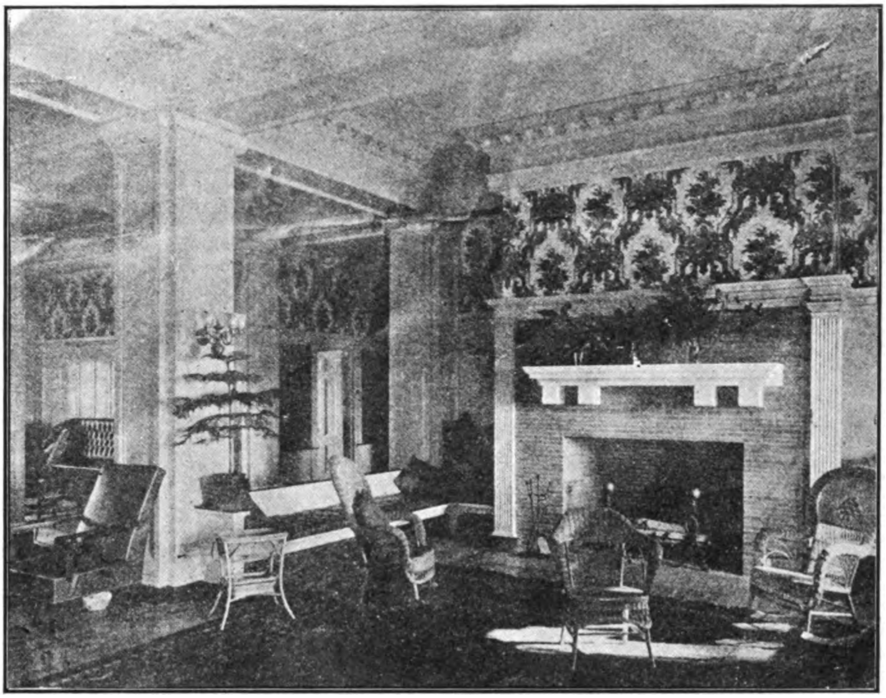
A typical upper-third treatment of the more elaborate modern type is herewith illustrated. The lower two-thirds of the wall is a wainscoting with molded panels, done in white, and with square, enameled classic columns, which are used as motifs for the fireplace facing in red, pressed brick. These are the determining colors for the floral treatment. The white of the woodwork is carried out in the background of the pattern. The brickwork gives the key-color for the flowers, and the green foliage in the upper-third is the key-color for the floor covering. By the same process, any hangings in the room, and cushions on the permanent seat beside the fireplace may be done in the same shade of red that is used on the upper-third. The general color scheme of the room has the darker shade, green, as the basis. Then the lighter colors appear in the portieres and on the wall, and the wall is finally crowned by the upper-third.

The growing ferns on the mantelpiece, and the potted tree beside the column at the left set off the rigid lines of the wood trims of the room acceptably, and also contribute a color note that varies the scheme of color pleasingly. A little touch or two of this kind varies the monotony of effect, and enhances all the artificial decoration in the room. This is one of the valuable features of growing plants in decoration, but they should be used sparingly or their effect is lost.

Whether there is an upper-third treatment used above a wainscoting, as in the illustration above, any picture which may be hung should usually be placed in the upper-third. But if the upper-third is hung above a plain paper, the lower portion of the wall is the better place for hanging pictures, especially if the paper or burlap be dark.

Very pretty upper-third treatments are possible for the dining-room by the use of a plain, dark-toned paper both above and below the chair rail, and a tapestry floral paper for the upper third, using either a plate rail or a picture railing at the dividing line. These tapestry florals may be had with matching papers containing a faint pattern in line.

The writer has in mind a very pretty upper-third treatment, combining the beautiful Japanese grass cloth and a Cretonne in pale yellow floral design with grayish green foliage. A frieze treatment was made by means of the Cretonne, which was also used at the windows and as portieres. The shade of the grass cloth was of a pale yellowish color for which it would be difficult to give an acceptable or accurate name. It matched in color the large yellow flowers in the fabric. Such an upper-third would be exceedingly good for an ill-lighted but rather commodious room. Mission furniture or Arts and Crafts furniture, willow or cane, would be in keeping with a scheme of this character. Grass cloth is obtainable at any high-class decorators at about $4 a roll. It is very effective material, having the delicate "sheen" of silk and the coarse texture of burlap.



A Typical Upper-Third

The floral upper-third is one of the attractive possible treatments for the living room with a panel treatment in plain wood trims. The wood trims are either painted or enameled in white, and the field of each panel filled in with a plain green cartridge paper. The upper portion of the paneling is built in the form of photograph rail, and there is another narrow wood trim in white placed next to the ceiling. The upper-third is filled with a floral paper.

The usual effect of the upper-third style of decorating a wall is to give the room greater apparent height. This is especially the case if the upper-third reach completely to the ceiling. If, however, moldings in plaster, etc., are used, as in the illustration on this page, then the result, if any, is to make the ceiling appear somewhat lower than it really is. The upper-third is at the best when used with a plain body paper, although a score of attractive variations may be easily gotten up.

* * *

An Opportunity for American Architects

An opportunity is offered to American architects to present plans for a handsome villa in Hildesheim, Germany. This takes the form of a competition under the auspices of the German Brick & Terra Cotta Manufacturers' Association, whose officials extend a courteous invitation to American architects to participate in the competition on the ground that they have probably had more experience in planning for this type of construction than the German architects. In America, the use of terra cotta for building purposes has advanced to a very high stage. Full particulars and conditions of this competition can be obtained by application to Karl Dummler, Berlin, Germany. This competition is for a residence to cost 50,000 marks.

Landscape Architecture

Landscape Gardening in California

LANDSCAPE architecture and gardening as an art can hardly be said to exist in California as yet, and this is only natural, because California is one of the newest States of a new country, and the art of landscape gardening is one which, for economic and social reasons, is almost the last of the arts to be assiduously cultivated. Of course a great deal of artificial planting has been done of late years both in public parks and on private ranches and estates; but the object of this planting has been almost entirely practical or horticultural. The rancher who builds a house on a bare plain or hills will nearly always surround it with a mass of eucalyptus or cypress trees, which will serve both as windbreaks and as protection against the sun, while in the fashionable suburbs near San Francisco and further south quantities of trees and shrubs have been planted in the vicinity of the largest houses. But, we repeat, the practice of landscape gardening and architecture as an art can scarcely be said to exist. Local architects who are familiar with the whole field of California rural architecture state that there are scarcely a dozen estates and gardens in the whole coast country, which have been planted for the purpose of making the trees and the shrubs contribute to an architectural effect. Even well-to-do people rarely understand that the character and distribution of the large vegetation on a country estate is vitally associated with the design and the situation of the houses, and that expert advice and assistance are needed as much for the layout and planting of the grounds as for the planning of the buildings. The planting is placed in the hands of some Scotch or German gardener, whose chief purpose is to sell as many plants as he can to his customer, and whose point of view at its best is exclusively that of a horticulturist.

We have been informed by local architects that there is not a single gardener resident in the State who is capable of taking an architect's plan and of designing a planting scheme in reference to the salient architectural lines and masses; and this is a fact which young men who graduate this spring from schools or courses of landscape gardening will do well to bear in mind. A great opportunity awaits them in California, and in case they were competent and trustworthy they would have every chance of building up a lucrative business. Of course, it would for a number of reasons take time. In the first place the vegetation of California is peculiar in many respects, and would require careful preliminary study by a man who had been brought up in the East. Not only does the landscape gardener have an enormously greater variety of plants to draw upon, but the habit of shrubs and trees common both to the Pacific and the Atlantic Coast is different in each locality. It might well take a newcomer several years of study and practical experience to master the material conditions necessary to the practice of landscape gardening in California. Furthermore, he also would be handicapped in the beginning by the fact that, as we have already pointed out, many people who spend money upon planting do not as yet realize that they need the assistance of a man who unites scientific and technical training with practical experience. Nevertheless he would have every assurance of winning out in the end. He could depend upon the assistance of some of the architects, and he would have behind him the big palpable fact that the coast country of California provides the most wonderful opportunity in the United States for landscape gardening on a large scale.

The opportunity which California offers is extraordinary both because of the great need of extensive artificial planting and because of the unusual resources which the landscape gardener has at his disposal. Those parts of California, in which men are being and will be tempted to erect large country houses, have not been well provided by nature with trees. The coast country, which is best adapted both by climate and beauty of landscape to human habitation, is a country of low and almost bare hills and valleys, and the architect when he comes to design a house in such a neighborhood has a free hand. He can arrange almost with precision for the kind and amount of foliage which he thinks will contribute to his architectural scheme, and if his scheme is an elaborate one, and includes long approaches, terraces and gardens, his plans will necessarily call for an amount of planting to which we are not accustomed elsewhere in the country. Moreover, as we have said, not only are the trees and shrubs upon which he can draw almost inexhaustible in variety, but they possess in certain notable and familiar instances the quality of being peculiarly adapted to the uses of the architect and the landscape gardener. The live oak is under any circumstances one of the most beautiful trees in the world; but it in addition looks extremely well around the right kind of a house.

In such a country so bountifully furnished by nature with the material for its own adornment and so blessed with a mild and invigorating climate, the desire to build and to plant must surely follow upon the opportunity. Californians themselves are better able to afford such luxuries than they were formerly; and it is not only Californians who will build during the next thirty years. Rich American families will want villas and country places in California just as wealthy Europeans want villas on the Riviera. The coast country of California is bound to become the great American pleasure garden, which will be frequented quite as much in the summer as in the winter, and which will constitute an irresistible attraction to all sorts of people with leisure. Of course it will attract many families who merely want to spend money and to loaf, but it will also attract others who will appreciate what a chance it affords to enjoy the highest interests and pleasures of country life. It may be inferred, consequently, that young landscape architects and gardeners are not taking very much risk in settling in such a country. They must be prepared for a longer period of apprenticeship than would be necessary in the East, and probably for certain discomforting experiences at the outset of their career; but in the long run if any of them should fail it would be their own fault.—The Architectural Record.

The Architectural Draftsman With School Training

MUCH has been said and written about the architect and various phases of his professional life, but scarcely any one has yet raised his voice in defense of the architect's employee, that sometimes snubbed but very useful and often indispensable person, the draftsman.

In this discussion it is proposed to speak only of the man who through some advantage or through hard work has really tried to improve himself by studying the art of architecture in some recognized school. Of course this classification does not include many men who are just as capable and equally deserving of success and who have acquired their professional knowledge in some other way, but they in the very nature of things are exceptions, and for that reason may properly be omitted.

How many young men are annually turned out of the various architectural schools of the land, some of them the sons of people in moderate circumstances, who have been able to give their sons the advantages of an education which they deserve, and others who have had to pitch in right after leaving the grammar school or the high school and earn their own living, tracing details in an architect's office and gradually acquiring a commercial value to their employer which after several years has finally enabled them to save enough money to pay their way through the professional school, and this only in cases where they had kept up their academic training and were able to pass the necessary examination; many others started, got discouraged, and fell in the struggle. But it is of the successful ones that we speak; of those fellows who have fought long and hard and who have finally won out. We mean to include also the men who have had even the greater advantage of foreign study and travel.

What happens to all these men after they leave school? Let us follow them from the beginning of their career. They get a job, perhaps, through the school or through their professor. They don't get much pay for a year or so, but gradually catch up with the office-taught man. By reason of better training they are enabled to do more individual and independent work and get along admirably for a time. Then there comes a lull, the office force is very large, work gives out and the men are laid off one by one; finally our subject's turn comes. He has got accustomed to the place and feels rather hard hit; he looks for another job and finds that the people are not as nice to him or as ready to listen to his story as he has previously found them. They ask him many questions, to some of which he must give evasive answers or fail of his purpose.

He gets his first real hard rub, and very often from people who have been through the same mill but who have utterly forgotten the fact, in their altered circumstances. Thus the draftsman goes along sometimes for years, getting experience, it is true, all the while, but with small opportunity to improve his condition.

Even if he is lucky and strikes a steady job, what chance has he for making friends who will be able to help him set up his own office some day? He is cooped up all day long in the office and sometimes many evenings, too, always pushing the pencil (only few get the chance to superintend their employers' work), and in some cases men have been designing for years and don't know their own work when they see it afterward—a truly sad state of affairs.

If the office be a very large one, the men are apt to be specialized, e. g., a man is good on plan, on elevation or on ornament. He is kept working on his specialty to the exclusion of other parts of the work, thus helping to nullify the valuable the valuable training received in school of studying plan, elevation and section together. Of course this scheme in school is very easy to work but often impracticable in an office, especially on a very large job. There is, nevertheless, a tendency of the architect to get as much out of a man commercially as he can, irrespective of its effect on the man, and for this reason alone many men are continually changing offices. Every now and then one meets a friend who used to be with a certain firm and who informs you he is now working for Mr. C. He explains: "You see Messrs. A. & B. are very nice people, but they seemed to think I was particularly useful to them in arranging their business with the building department, so they kept me busy filing plans and making amendments. I didn't mind doing it once or twice, but I felt that they were taking an unfair advantage of me, so I got out. Mr. C. does not get such important work, but I get a chance at many things; sometimes I have entire charge of a little job. It isn't much, but I get a chance to apply some of my school training in solving a complete problem. I feel that my employer has some interest in my welfare besides expecting so much work of me."

The relation between employee and employer is often a false one; both have had good training, and sometimes the draftsman has superior ability, but, of course has to do as he is bid, but the question is one rather not so much what the boss says, but the nasty way he says it. The draftsman gets a piece of work, say a plan; he is told to make it at one-sixteenth-inch scale; there are streets on two sides; the building is to be a hotel; his employer gets the plan when it is finished, and does not further take the author into his confidence. The draftsman, being human, feels hurt, and justly so. Other instances could be cited to show that the relation between the architect and his draftsman is not one of entire confidence and harmony, and too commercial. The draftsman is willing to work at all hours just to keep on the right side of his employer, who does not always reciprocate to the same extent.

At best the situation is a very difficult one, and so much more easily deplored than remedied, and it must be said in justice to the architect that he has realized how serious it really is and how vital the draftsman is to the success of his business; yea, even to his profession. For when he gets big work and lots of it he can, of course, give only a general supervision to the various problems that arise; for the actual working out of the details he must depend upon his draftsman. To secure themselves against being left in the lurch, as well as to help the men, some architects have a practice of lending one another draftsmen when the occasion demands it, but even this scheme is not altogether successful from the architect's standpoint, or very helpful or pleasant for the men.—H. W. F. in The Architectural Record.

* * *

A Safe Fire Escape

THE following plan for a fire escape, for large buildings, was suggested by S. A. Jennings, a Seattle architect: He would have a tower for a fire escape, square in plan, 12x12 feet in the clear. This would allow stairs four feet wide with four platforms between each floor, with a four-foot square well or ventilating shaft. Tower to stand independent of building and to be constructed of reinforced concrete, as also should be stairs and railing. Double action fireproof doors should open into this staircase from each floor. The tower should run above the roof high enough to be pierced on all four sides with louvres of sufficient capacity to carry off the smoke in case of any or all doors fouling in time of fire; the whole to be surmounted by a skylight provided with a large ventilator.

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State Board of Architecture

President .... HENRY A. SCHULZE
Secretary-Treasurer .... LIONEL DEAN
Asst. Sec.-Treas .... FRED H. ROEHRIG

Northern District

HENRY A. SCHULZE, LIONEL DEAN, SETH BABSON, WILLIAM CURLETT, CLINTON DAY.

Southern District

JOHN P. KREMPEL, FRED H. ROEHRIG, OCTAVIUS MORGAN, SUMNER P. HUNT, W. S. HIBBARD.

San Francisco Chapter of American Institute of Architects

President .... HENRY A. SCHULZE
Sec.-Treas .... WILLIAM CURLETT
Vice-Pres .... WILLIAM MOOSER
Trustees .... JAS. W. REED and CLINTON DAY

Regular meetings, the second Friday in January, April, July and October.

Wrecking the Mutual Bank Building

The ten-story Mutual Life building at Sansome and California streets, one of the first Class A structures erected on the Pacific Coast, is being stripped down to the third-story level. This is the second steel and brick building to be wrecked in the United States and engineers are watching the demolition with unusual interest to learn the effect of fire and time upon the building materials and their welding together.

Six stories, containing millions of brick, a great web of steel beams, girders and wind braces, many thousand tons of terra cotta and all the intricate metal fittings, bracings and finishing pieces are to be carried down to the ground within thirty days.

When this structure was put up skyscraper construction was in its infancy. There were only the World building in New York and the Auditorium in Chicago and a few other monuments of this modern departure in architecture and engineering.

A few years ago the Pabst building, located on the site now occupied by the Times building in New York, was torn down. At the time a great deal of comment was made on the fact that the steel in the building had not suffered from rust—that is the steel embedded in masonry.

In taking down the San Francisco skyscraper the same evidence of the durability of steel encased in masonry is being found. All of the steel in the Mutual Life building that was encased in masonry is in a state of good preservation. Only the beams and columns that were sheathed in light tiling suffered. It is declared by engineers that the fire did all the damage.

The Flannery Building

The first reinforced concrete building to be erected in the old business center of San Francisco since the fire is the five-story structure at the gore of Market, Geary and Kearny streets. The owner is H. P. Flannery and the plans were by Stone and Smith, architects in the Midway building. The concrete is built around a heavy steel frame which is intended to support three additional stories when business warrants. The exterior is to be cemented and attractive ornaments of the same material will give the structure a finished appearance. Mr. Flannery has had the greatest faith in the future of San Francisco all along and as early as the middle of May he ordered plans to be prepared ; on June 6th the contract for the steel work was let. The frame was up and ready for the concrete July 28th.

The building will be ready for occupancy in a few weeks. It cost $50,000 and features of the structure will be a private telephone system with a central office in the vestibule connecting by phone every office in the building. A high speed Otis elevator will be installed.

Biscuit Company's Plant

Ralph Warner Hart, architect for the new building for the American Biscuit Company, has returned from the East where he went to gather ideas in modern factory construction. Work has been started on the new building which will occupy an entire block bounded by Broadway, Battery and Vallejo streets.

The structure will be of reinforced concrete and will cost $400,000. It will be absolutely fireproof. The fixtures and what little furniture that will be required will be of metal. The foundations are fast nearing completion, day and night shifts being employed.

Nine-Story Hotel

The American-Hawaiian Engineering and Construction Company has taken the contract for the erection of a nine-story Class A hotel on Turk, near Hyde street, San Francisco, for D. S. Dorn. It will be known as the Hotel Rex. The front will be a glazed brick and the lobby of the hotel will be of marble and stucco work. The building will cost $200,000. Only five stories will be erected at first. Dodge & Allen are the architects.

Phelan's Great Building

Former Mayor James D. Phelan has decided upon the height of his new building which is to replace the old Phelan structure on the north side of Market street. It will be ten stories with a steel frame. Whether reinforced concrete, stone or brick will be used is as yet undecided. The building will represent an outlay of $3,500,000. It will take about two years to build the structure and it is hoped to start work by the first of January.

Two Churches

The First Presbyterian Church of San Francisco is to build a temporary edifice on Washington street, near Van Ness, to cost $7,500. Cook & Young have the general contract.

The St. John's German Evangelical Church has entered into a contract for all the work except hardwood finish, painting, shades and chandeliers, for a two-story frame church building on the west side of Larkin street, near Vallejo. The building will cost $10,000.

Electricians' Banquet

A notable banquet was held in San Francisco a few evenings ago, the participants comprising about 125 of the leading electrical contractors and representatives from each of the several electrical supply houses in the city. The affair was quite informal and was arranged by a committee of engineers and contractors, who had in mind the bringing together for better acquaintance and social intercourse the men in this branch of the building industry. A fine menu was made doubly enjoyable by a musical and literary program furnished by professional talent. During the evening speeches were made in favor of a permanent organization, and various plans for starting an electrical club were discussed.

To Restore Wells Fargo Building

A contract has been let to M. F. Gale by the Wells Fargo Company for stripping the company's big office building at the corner of Mission and Second streets. Plans have been prepared by Architects Meyers and Ward, and they call for two additional stories, making the building eight stories. It is possible that artificial stone will be substituted for the granite for the first floor, as the natural stone was badly damaged by the flames. The upper stories will be of pressed brick and terra cotta, the same as before. There will be a wider light shaft in the new building, and to permit this some of the offices will be made smaller. The improvements will represent an outlay of $500,000.

Oakland Masons to Build

The Scottish Rite Masons have decided to sell their property at Fourteenth and Harrison streets, opposite the site of the new Oakland Hotel. They will erect a new cathedral on a site at the southwest corner of Fifteenth and Madison streets, which has been purchased by the cathedral association.

Progress of New Work

On Sansome street, work was commenced during September on the Mutual Life Insurance Company's building. The repairs to the Kohl building are nearly completed, and good progress is being made on the Merchants' Exchange. The work on the latter is very extensive and includes almost entire new exterior walls. On Market street, near Sansome, premises are now being cleared for a permanent building which will be occupied by a large stationery and publishing house. The contract has been let and it is expected that the work will be completed by February 1st next. The white-marble front of the Security Savings Bank building, on Montgomery street, near Pine, is being restored, and the American National Bank, in the Merchants' Exchange building, has awarded contracts for elaborate fixtures of marble and bronze for its banking-room.

Orpheum to Build

The Orpheum Amusement Company has purchased Hamilton Hall, at the corner of Thirteenth and Jefferson streets, Oakland, from C. Mayer for $55,000. The same purchaser recently acquired the Raymond

Hotel property, which extends through from Twelfth to Thirteenth streets. The Orpheum Company will shortly commence the erection of a first-class amusement house on the property.

New Architectural Firm

E. Matthewson, the Fresno architect, has formed partnership with N. W. Mohr, a draughtsman of some prominence, and an office has been opened at No. 622 Golden Gate avenue, San Francisco. The new firm already has considerable work of importance including a $30,000 business block and several residences.

Barron Estate's Hotel

The Woodruff Construction Company has the contract for the erection of a seven-story hotel for the Barron estate at the corner of Taylor and Geary streets. The hotel will contain 280 rooms and will be built on a plan similar to the new Astor House in New York. It will cost $300,000.

Contract for Cotton Bros.

Goodall, Perkins & Company have given Cotton Bros. the contract for the erection of a two-story brick building on the site of the old Perkins property at the gore of Sacramento and Market streets. Nearly all the old tenants have leased store or office room in the new building, which is considered a positive indication that the old firms that formerly were in business in that part of the city will return to make Market street what it used to be from a business standpoint.

Personal Mention

The firm of Gibson & Paradice, architects, with offices at 701 Swetland Building, Portland, Oregon, has just been launched. Its personnel is composed of Frank B. Gibson, for the past five years superintendent of construction for Richard Martin, Jr., architect of Portland, formerly of Detroit, Mich., and Frank H. Paradice, Jr., architect of Denver, Colorado, where he has been in business for the past five years.

Retire from Business

The Cahill & Hall Elevator Company, formerly at 2646 Union street, announce that they have retired from business. The company formerly did quite a large business in elevator construction.

Building Reports

Apartment house—McAllister and Devisadero streets, San Francisco.
Architect—Julius Krafft.
Owner—William Wilson Co.
Cost—$35,000.
The building will be a frame structure, three stories high and will contain five stores and ten apartments.

Office building—Market street, near Third, San Francisco.
Architects—Reid Bros., office in new Butler building, Geary and Stockton streets, San Francisco.
Owner—Claus Spreckels.
Cost—$200,000.
Plans have been finished and bids are now being taken for a six-story building to be known as the "Spreckels Annex." The old annex was five stories. It will be built between the Call building and Uhl Bros. building. The structure will be Class A and the steel frame will be faced with stone.

Apartment house, Turk street, between Larkin and Polk, San Francisco.
Owner—Mrs. Charlotte S. Clark.
Architects—Meyer & O'Brien.
Cost—$140,000.
Work has been started by the Schofield Construction Company on a five-story building of reinforced concrete. There will be stores on the ground floor and 180 rooms above.

Four story reinforced concrete building—southeast corner of Ellis and Anna streets, San Francisco.
Architects—Coxhead & Coxhead.
Owner—Irving Scott estate.
Cost—$100,000.
The building will be 100 by 110 feet and will contain 200 rooms with outside baths and will be known as the Pacific Grand Hotel. The lobby will be finished in white marble wainscoting, with white marble columns. There will be a cafe facing on Anna street. Bids are now being taken and the contract will be let so the building can be completed by May 1st.

Four-story and basement building—Clay Street, San Francisco.
Architect—W. H. Weeks, Merrimac Building, San Francisco.
Owner—Miss Pauline Torpey.
Cost—$45,000.
The building will be of brick and terra cotta and will contain stores and rooms.

The same architect has plans for a three-story brick building for H. E. Irish, to be built on Stockton Street, San Francisco, at an outlay of $20,000.

Three story and basement building, Market street, west of Marshall Square.
Architect—Herman Barth.
Owner—Bernard Schweitzer.
Cost—$50,000.
The building will be of pressed brick, 55 by 100 feet, and will contain stores and offices.

Three-story rooming house—Mission and Eighth streets, San Francisco.
Architect—Julius Krafft.
Owners—P. J. and J. McGovern.
Cost—$25,000.
The building will be of brick and will contain stores and rooms. No contracts let yet.

Pavilion and bath house—Santa Cruz.
Architect—W. H. Weeks, Merrimac building, Market and East streets, San Francisco..
Owner—Santa Cruz Beach, Cottage and Tent City Corporation.
Cost—$250,000.
Contracts are about to be let for a handsome structure to replace the one destroyed by fire early in the summer. The style will be a pleasing combination of Spanish and Mission, with plastered exterior and imposing domes richly gilded. The very best sanitation and plumbing will be installed and the bath house will contain cement pools lined with tile and novice glass.

Bank building—Salinas.
Architect—W. H. Weeks, Merrimac Bldg., corner East and Market Sts., San Francisco.
Owner—Bank of Salinas.
Cost—$30,000.
The building will be of sandstone, with mahogany interior. Bids are now being taken.

Residence—First Street and Hensley Avenue, San Jose.
Architect—W. H. Weeks, Merrimac Bldg., San Francisco.
Owner—Mrs. Annie Dougherty.
Cost—$20,000.
The house will be colonial in design, cement foundations and all modern improvements. Plans are about finished.

Carriage warehouse—Twelfth and Jackson streets, Oakland.
Architect—A. W. Smith, 1004½ Broadway, Oakland.
Owner—Coast Carriage Company.
Cost—$60,000.
Contractor—Cary & Hale.
Ground has just been broken for this building which will be two stories.

Three-story brick building, Clay street, San Francisco.
Architects—Meyers & Ward, Wells Fargo Building.
Owner—Hyman Bros. Co., incorporated.
Cost—$35,000.
The same architects also have plans for a three-story apartment house for Ruth and Sol. Hyman, to be built on Hoff avenue and Sixteenth street. It will be a frame structure.

City Hall—Van Ness and Hayes Sts., San Francisco.
Architect—City Architect Shea.
Cost—$80,000.
Bids are to be taken at once for the erection of a temporary structure, to be of wood, with metal lath exterior, covered with cement and ornamental stucco work. The building will have a frontage of 284 feet on Hayes street and 120 feet on Van Ness avenue.

Seven-story store and office building—First and Market Streets, San Francisco.
Architect—Ben G. McDougall, Monadnock Bldg., San Francisco.
Owner—Sheldon Estate.
Cost—$240,000.
Plans are now being completed for this building, which will be seven stories, of reinforced concrete; five stores; 28 offices to a floor; corrugated bars for reinforcement; mosaic corridors; two elevators.

Class C, stores and lodgings, Polk and Bush streets, San Francisco.
Architect—Julius Krafft.
Owner—Henry Sahlein.
Cost—$50,000.
Plans have been finished and a portion of the contracts have been let for a five-story building, of brick and terra cotta and all modern conveniences.

Hotel and Store building—Mission and Howard streets, San Francisco.
Architect—Julius Krafft, 509 Golden Gate avenue, San Francisco.
Owner—William Wilson Company.
Cost—$40,000.
The building will be four stories, Class C, of brick and terra cotta. The contract for the foundation only has been let.

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Architect and Engineer
OF CALIFORNIA

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SAN FRANCISCO AND LOS ANGELES

OFFICES
621 Monadnock Building - San Francisco
Telephone Temporary 1928
142 Broadway, Los Angeles Phone, Home 5747

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Vol. VI. OCTOBER, 1906 No. 3

SAN FRANCISCO BORN AGAIN

San Francisco is surely rising from its ashes. One needs only to look about him to be convinced of this fact. New buildings of substantial character are going up on all sides; the great sky-scrapers, that were not seriously damaged, have been stripped of loose brick and stone; the steel frames have been repaired and strengthened, and the work of providing new facings, either of brick, terra cotta, stone or cement is progressing faster than even the most enthusiastic ones predicted. Several of the big office buildings are occupied; others will be ready before the first of the year.

During the months of June, July and August, building contracts aggregating $8,287,187 were made. During September, 1050 building permits were issued. Bank clearings for September reached the amount of $198,712,503. For the same month in 1905 the clearings totalled $168,329,716, showing an increase of 18.04 per cent.

Thirty-five thousand men are doing construction work and thousands more can be used. Railroads entering the State report that traffic has increased enormously, both on colonist and tourist tickets. The population of San Francisco is placed at 370,000.

Architects have all the work they can attend to. Much of this was at first of a temporary nature. Now it is nearly all permanent work. Owners are asking for fire-proof construction, and the latter is going to become a marked feature in the rebuilding of the city. Some very beautiful designs for office buildings, fraternal halls, churches, etc., are being made by San Francisco architects, and it is only a question of time before the city by the Golden Gate will have regained its coast supremacy, architecturally as well as commercially.

A SNAP FOR JUNIOR DRAFTSMEN

The Western Architect declares that the "cubs" in the architects' offices of Buffalo are in a fair way to enter competitions and obtain spending money outside of their salaries. The County Committee proposes to obtain designs for county buildings by competition, pay an expert $100 for his work, and award the three best drawings $100, $75, and $50, respectively, the drawings then to become the property of the county "for any use the board may see fit to make." The farmers in North Dakota might be excused for having so small a conception of the value of an architect's services and knowledge of the quality of work such an arrangement would bring, but it is hard to imagine how such crass ignorance can be found in Buffalo.

* * *

NEW FEDERAL BUILDINGS

The large number of appropriations made at the last session of Congress for the purchase of sites and the erection thereon of over 150 new Federal buildings throughout the country has directed with renewed interest some attention from the profession to the provisions of the Tarsney Act, which authorizes the Secretary of the Treasury to open competitions for drawings, plans and specifications for such public buildings as he may select.

While the majority of these buildings will be designed in the office of the Supervising Architect of the Treasury Department at Washington, who may justly be given credit for the successful and very creditable showing which has been made by his office, yet there is an inclination among many to doubt that the best results can be attained, should he be required to undertake immediately such a large task, and bring it to a speedy and satisfactory conclusion, and there is a hope that this condition and the public interest will induce the Secretary of the Treasury to select a generous number of the buildings to be erected under the Tarsney Act. A synopsis of the regulations governing competitions under this act will be published in the November issue of the Architect and Engineer.

Appropriations now available and of special interest in this State are: Enlargement of present site and new Sub-Treasury building, San Francisco, $375,000; Postoffice and Custom House, San Diego, $150,000; Postoffice, Custom House and Land Office, Eureka, $120,000; Postoffice, Santa Rosa, $70,000; Postoffice, Santa Cruz, $15,000.

W. A. NEWMAN, Architect.

* * *

THE NEW CITY'S STREETS

San Francisco's character in respect to streets will be determined by the votes of the people in November. I believe our people have the courage, the stamina and the resolution to set a standard in this matter of vast street improvement which the whole world will notice, and to place ourselves and our city in the front ranks of the great doers of things. We, of course, know that it will pay, but let it be done without this thought—let it be an expression of our love, trust and confidence in our own.

No city on earth has more splendid support from natural environment, climate, etc. We could make it the show city of the world if we would, and we shall if we once realize its value. If the tourists to Italy pay the expenses of the government, what would it mean to us who have, besides things to see, a country teeming with riches and resources to sell and develop through our visitors who would cast their lot here and become workers with us.

HERBERT E. LAW.

The Publisher's Corner

Chubbuck & Harris.

Chubbuck & Harris, sales agents, with offices in the Atlas building, No. 604 Mission street, are handling strong lines of building materials and report business exceedingly good. They are introducing to the local market Holdtite hardwall plaster, a superior gypsum plaster manufactured in Amboy, Southern California, and in the last two months have made sales aggregating 3000 tons. The reconstructed Fairmont Hotel and Merchants' Exchange office building are being plastered solely with Holdtite, besides numerous other smaller buildings.

The above firm is also selling agent of the celebrated "Cleveland" Expanded Metal Lath, and report a sale of 60,000 square yards of this lath for use in all partitions and ceilings in the Merchants' Exchange. The lath was selected over all other makes on account of its rigidity, strength and plaster holding qualities.

Chubbuck & Harris also handle lime, brick and cement, and while a young firm, being in business but a few months before the conflagration, are making themselves a strong factor in the building world by strict attention to business, reasonable prices, and prompt deliveries.

Hercules Plaster Fibre.

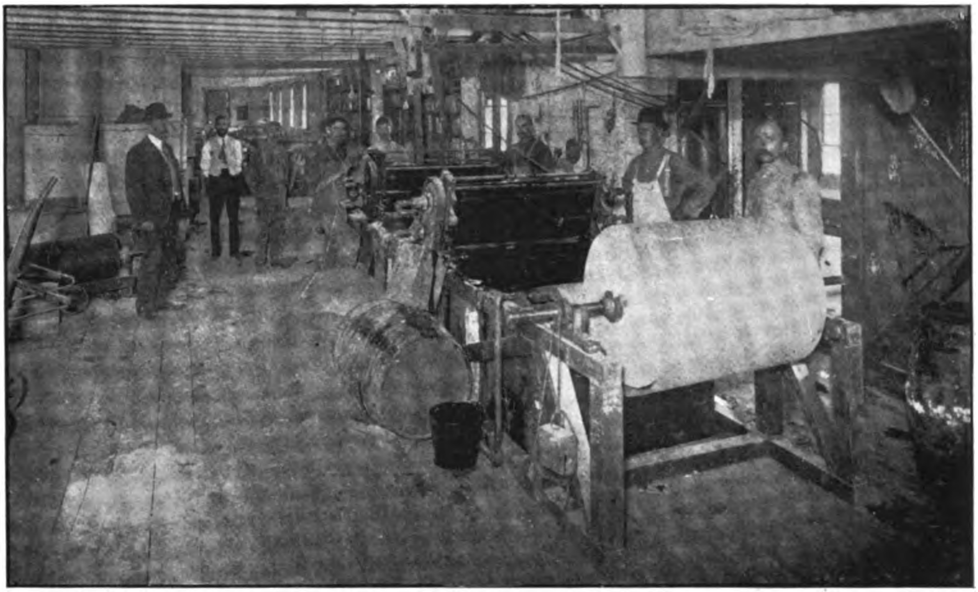
The Hercules Manufacturing Company is running its factory at 221 San Bruno avenue, San Francisco, day and night to keep up with orders. The company's business has doubled since the fire. The plaster containing Hercules fibre stood the earthquake well. The company manufactures a special fibre for hard wall plaster, which is gradually taking the place of other substitutes. Hercules fibre is indestructible. Length of time in mortar, hot lime, or even hot weather does not injure or destroy it. Lime does not eat or destroy vegetable matter as it does animal matter. Hercules plaster fibre is purely vegetable. Hercules plaster fibre is purely sanitary, as it is free from all germs and odor.

Eugene Dietzgen Company Busy.

The Eugene Dietzgen Company is again located in the down-town business part of San Francisco, and architects and engineers are elated. This company is the most popular of the several firms in San Francisco handling drawing materials, surveying and mathematical instruments, and probably does as much business as all the other concerns combined. The company's prices are right and its goods are the best. For the present down-town quarters have been established at 35 and 37 Fourth street. When the building is finished the firm will return to its old location at First and Stevenson streets, where it will have about 9000 square feet of room. The company is maintaining a blue print department at 2125 Union street.

The Gregory Hardware Company

The Gregory Hardware Company, incorporated, 519-521 Golden Gate avenue, San Francisco, are handling, in addition to their full line of builders' hardware and mechanics' tools, a full stock of sugar pine sashes and doors, and also have a corps of competent glazier's in their employ, who are kept constantly busy on work in their line.



A Flexo Machine in Operation

Demand for Flexo Paper.

Hardware dealers who are handling the new fire-proof roofing paper, Flexo, report a steady increase in the demand for the paper, and the factory in East Oakland is being run day and night to keep up with orders. The following hardware dealers are handling the paper: Gregory Company, 519 Golden Gate avenue; Osborn Company, 517 Golden Gate avenue; Bennett Bros., 1034 Mission street; W. J. Donnelly, 11 Stockton street; Large & Moore, 1180 McAllister street, and others. W. J. Piatt, president of the Flexo Company, is also the president of the Bayside Manufacturing Company of East Oakland, says the call for the new roofing paper exceeds the company's expectations. To accommodate the trade a branch salesroom has been opened at 3279 Sixteenth street, with E. D. Thompson as manager.

Glass Business Trebles.

Holt & Habenicht, who were one of the first glass dealers to resume business after the fire, have so much to do that they are in search of larger quarters. They hope to rent the store adjoining their spacious shop at 269 Fell street.

Rudolph Habenicht is the new member of the firm and he attends principally to the outside work. He is a good business man, and Mr. Holt is authority for the statement that since the new partnership began the business has trebled. The firm is making a specialty of plate glass of all sizes; also a fine grade of prism glass, besides colonial, moss, ground and colored glass. Holt & Habenicht have the contract for supplying all the prism glass in the Jas. Flood Building, which is soon to be occupied by the Southern Pacific and other railroad offices.

History of the Yale Lock

Herewith is quoted several paragraphs from the Yale & Towne Manufacturing Company's catalogue on the history of the Yale Locks which is the history of a magnificent industry.

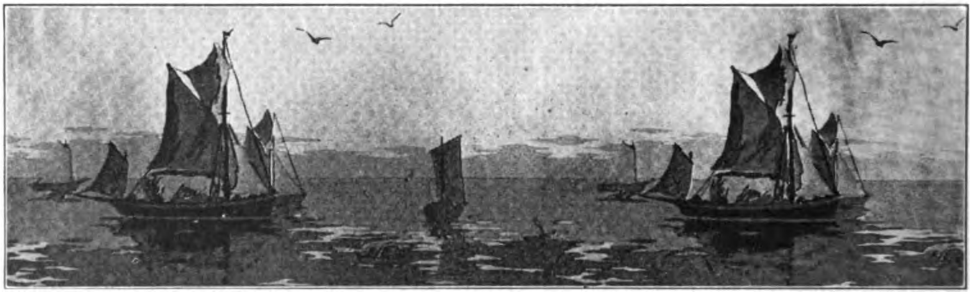
"There are chapters in the history of mechanical science which are as epoch marking as the achievements of soldiers or politicians in the history of a nation, and a bit of such history relating to one of the industrial arts, is here briefly recorded in the rise of the great Yale & Towne Manufacturing Company."

"Linus Yale, Jr., who was born in 1821, at Newport, New York, invented the lock, now so universally associated with his name, about 1862, and his original patents expired long since. His invention, and its subsequent development by his successors, have revolutionized the art of lock making in America."

"In October, 1868, Mr. Yale, then 47 years of age and apparently in good health, united with Mr. Henry R. Towne in organizing the corporation now known as The Yale & Towne Manufacturing Company, and in purchasing a site at Stamford, Connecticut, where the erection of a suitable factory building was begun. On December 25, 1868, Mr. Yale died suddenly, of heart disease, in the city of New York, leaving to the young enterprise the heritage of his brilliant inventions.

"In 1869 Mr. Towne succeeded to the presidency of the company, and its growth and development since then have been under his management. During these years the plant at Stamford has grown from a small workshop, employing about thirty men, to a great industrial works, covering some twenty acres of ground, with which, in 1894, the company associated, by purchase, an additional plant at Branford, Connecticut, the employes in the two establishments numbering over fifteen hundred persons. The products of the Company have increased correspondingly, both in variety and volume, and now embrace the most extensive line of builders' hardware in the world (including goods of the highest, cheapest, and all intermediate grades), cabinet and trunk locks, padlocks, door checks, bank locks, prison locks, postoffice equipments and chain blocks."

The exclusive San Francisco agency for this superlatively excellent line is held by the now well-known though new firm of Brittain & Company, Inc., on Van Ness avenue, corner of Turk street, whose large line of builder's hardware and tools is making it an important factor in the rebuilding of the coast metropolis.

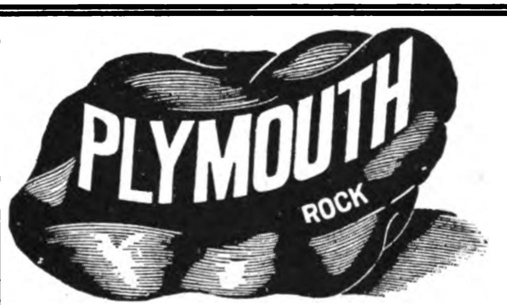


Ornamental Concrete Stone for Reinforced Concrete Buildings. by O. S. Sarsi.

THE successful architect employs the very best draughtsmen money will hire. He knows that he is the writer and they are the actors, as it were. ¶ A beautiful play can be made a failure if the actors are inferior. ¶ A few cents saved on the decoration of your building will depreciate its value and at the same time the architect's artistic standard will be lowered. ¶ No trouble to call or show samples of my work used on scores of the best buildings in the East.

O. S. SARSI, 1112 Eddy Street, San Francisco

ORNAMENTAL ARTIFICIAL STONE MODELING, CARVED STONE, ETC.



Hard Wall AND Wood Fibre PLASTER

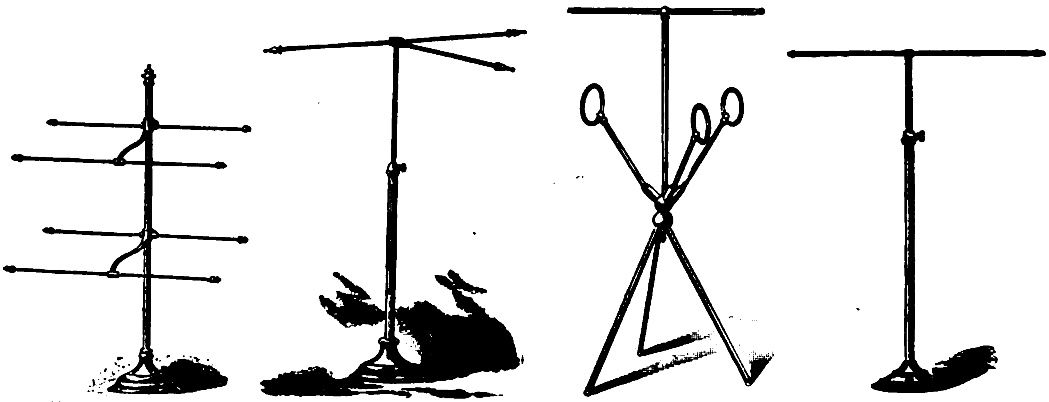
and Plaster Paris are the purest (99$\frac{9}{10}$% pure gypsum), strongest and will go further than any plaster on earth. We have the only *genuine* **Wood Fibre** plaster on this Market. No sand. Absolutely fire and earthquake proof. The Government Supervising Architect at Washington recommends our goods on Federal Buildings.

ORDERS PROMPTLY FILLED AND SATISFACTION GUARANTEED.

PACIFIC-PLYMOUTH PLASTER COMPANY

OFFICE AND WAREHOUSE:
083 Howard St., near 7th St.

SAN FRANCISCO, CAL.



Bids Wanted.

Visalia, Oct. 11, 1906.

Bids for the construction of concrete retaining, wing and abutment walls and piers for a bridge in the City of Porterville, California, will be opened in Porterville, November 5th.

MORSE L. WEAVER,
City Engineer,
P. O. address. Visalia. Cal.

To Build on Market Street.

The south side of Market street shows today the greatest activity in the building line and a marvelous change may be seen on this thoroughfare during the next six months.

Among the first to build will be Tobin & Driscoll, who intend to erect a four-story building on the south line of Market street between Sixth and Seventh. William Ede has announced his intention to build next to Tobin & Driscoll, but no decision has been reached as to the height of the building. James Coughlan, who owns a lot above where the Windsor Hotel stood, will put up a three-story reinforced concrete building. A. Legallet is considering building on his property, which is adjacent to that of Coughlan. C. L. Tams will build on the south side, between First and Second streets, and the Mark Sheldon estate will also put up its big building, which will also be on the south side of Market. Herman Levy is to erect a three-story building between First and Second.

Mr. Hicks to Build.

Lewis A. Hicks of the firm of Lindgren & Hicks, well known contractors, is to erect a $15,000 residence in Berkeley. The house will be entirely of reinforced concrete and will be one of the finest residences of any pretention to be built in this section of reinforced concrete.

Reed & Company.

Reed & Company, engineers and contractors, of 44 Market street, call attention to the fact that they are prepared to do all of the work and furnish all of the material in connection with the cleaning up and removing of debris, as well as the construction of all classes of buildings.

In this connection the company states, that owing to exclusive rights upon the bunker at Mission Wharf No. 2, they are prepared to handle debris in a more expeditious and economical manner than many others, and are also in a position to secure all grades of building materials at the lowest market prices.

Artificial Terra Cotta.

O. S. Sarsi and the T. V. Galassi Mosaic Company have just finished the imitation terra cotta in the light court of the James Flood Building. The work is a fine imitation of the genuine terra cotta, the difference being detected only upon very close examination. Mr. Sarsi has quite a little work of this class on hand, besides some artificial stone ornamentation for reinforced concrete buildings.

Master Builders Organize.

The Master Builders of Alameda county have organized an employers' and contractors' association. The new association is a combine on the part of all the builders and contracting firms in the county. Thus far no one but employers of union labor have been admitted to membership in the association. The purpose of the body is to have an effective organization to deal with the labor unions, when any questions of difference may arise, in order that they may be speedily and intelligently adjusted. It is one of the regulations of the new body that no craft or branch of any trade holding membership in the association shall at any time change the existing scale of wages in their craft, without first obtaining the consent of the entire body. In the event of any arbitrary action on the part of a craft or branch of trade or the employes thereof it will result in a complete tie up and cessation of all work until the trouble has been adjusted.

The new association will act in conjunction with a similar body in San Francisco. The master builders say that they have been compelled to form this association for their own protection.

For Steam Radiators.

In our advertisement on Page Seven will be found an illustration of an air valve, known as the Monash Improved No. 6 Four-Way-Drain Perfected Duplex automatic air valve for steam radiators.

The manufacturers Monash-Younker Co., New York and Chicago, claim for this valve superior points that are not in the make up of any other automatic air valve on the market.

The first particular point is the four-way-drain feature which drains the valve by capillary attraction returning the water of condensation to the radiator and not permitting the water to flow out upon the floors and carpets which is so frequent in the use of the ordinary air valve.

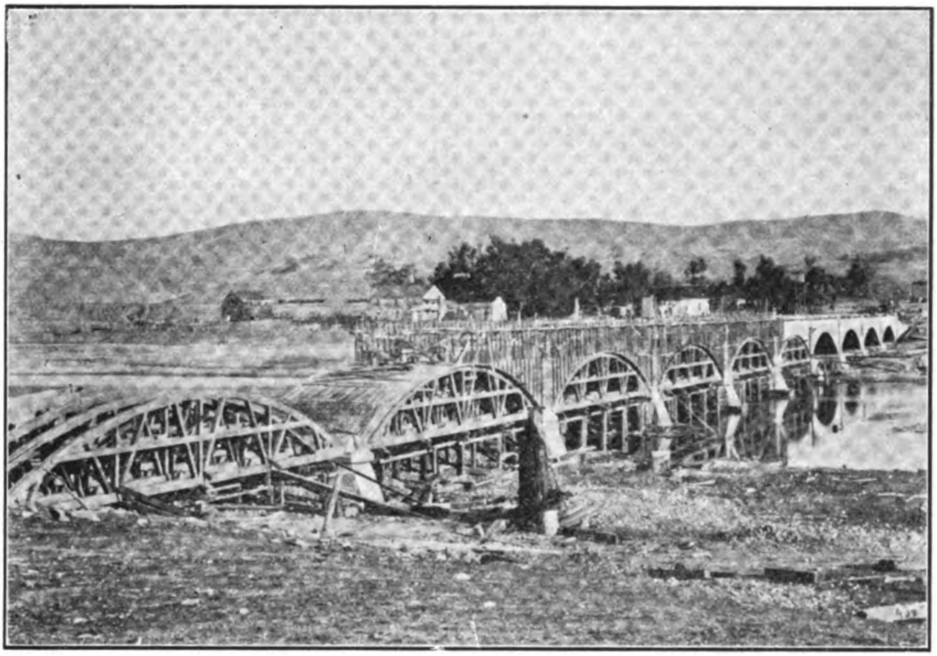
Second, the air tube carries the air out of the valve and at the same time gives it a direct independent passage above the water line, which equalizes the pressure in the valve and drives the water back into the radiator.

Third, the expansion post made pyramid shape is constructed of specially made material and will last from 15 to 20 years. No amount of expansion or contraction will effect its utility. The brass cap attached to the expansion post over which the float sets prevents the brass float from ever adhering to the expansion post when the valve is hot.

Fourth, this valve is locked shield and has a special key for adjusting; it has no cap to be lost, stolen or meddled with as in ordinary air valves. The valve is particularly adapted for office and apartment buildings. Let us quote from the guarantee which the manufacturers give direct to the consumer, it is as follows:

"If from any fault of construction this valve bearing our trade mark does not give perfect satisfaction within five years from the time it has been attached to the radiator, we will exchange it for a perfect valve at no further cost."

Architects who draw their own heating specifications and have not an open sample for inspection of this valve, will be furnished with one by the mere asking for it. Monash-Younker Co. make some 45 different styles of automatic air valves and have a very extensive catalogue, which they would be glad to send to any architect upon application.



Bridge at Pollasky, Ten 75 ft. Spans, Concrete Work by Worswick Street Paving Company

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Office, 1112 EDDY ST., San Francisco

San Francisco Representative, MR. O. S. SARSI

WE INVITE COMPARISON

Oakland Y. M. C. A. Building

It is announced that Oakland is to have a new Y. M. C. A. building. It is now several years since the former building at the corner of Clay and Twelfth streets was sold. At that time it was stated that a new building would immediately be erected on the lot purchased at the corner of Fourteenth and Jefferson streets, but for various reasons work was delayed.

The directors of the association have decided to put 'up a three-story fire-proof structure. There will be a large reading-room, a spacious gymnasium and an auditorium capable of seating 1200 persons in the new building. The structure will be according to the latest ideas of construction employed in similar buildings in the East.

Plans Fine Building

The Southern Pacific Company's plans for the improvement of the block bounded by Thirteenth, Fourteenth, Franklin and Webster streets, Oakland, call for an arcade structure to cost $250,000. Tenants at Thirteenth and Franklin streets have been ordered to vacate, the company desiring to install temporary offices in the building for District Freight and Passenger Agent Forsythe. The offices at 12 San Pablo avenue will soon be vacated to make room for the new First National Bank block.

Berkeley School House

Architect Board of Berkeley is making plans and specifications for a four-room Mission-style school house for the Peralta school district.

The clerk was also instructed to advertise for a building site to be secured north of ,Berryman and east of Shattuck avenue.

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George Goodman Artificial Stone Co.

General Contractors in
Concrete and
Artificial Stone Work

OFFICE
James Flood Building, San Francisco, Cal.

She (4:30 A. M.; half awake) — Dear, tell the architect to specify **Peerless Kitchen Boilers.**

He: — Of course. I know they are fine, but that's the third time you have said that to-night. Still, I don't blame you; I like hot water for my bath, too.

Have you ordered YOURS specified?

Make a note: — KICK NOW, not when the house is finished. See the plumber, too. : : :

PEERLESS AGENCIES CO.

(INCORPORATED)

16th and Carolina Streets

PHONE SPECIAL 449 **SAN FRANCISCO**

E. M. Swazey Goes East

Edgar M. Swazey, the well-known advertising man and versatile ad writer, will give up his work on the coast to enter a more extensive field in New York City. Mr. Swazey has a host of friends in San Francisco who wish his success in whatever he undertakes. His advertising business here will be taken up by M. L. Hadley, whose fifteen years' experience on the coast should be ample guarantee that his work will be satisfactory.

The drawing and verse which appears on Page 35 in this issue of the Architect and Engineer is taken from the September number of Building Management, pubished in Chicago and New York.

TO STUDY UP.

To some far wood I'll stray today
And squat beside a tree trunk,
And there I'll try to learn me of
The habits of the chipmunk.
—Concord Chronicle.

The man (in street car)—"Take my seat, madam. The Woman—"Thank you, but I also get out at the next corner."—Chicago Daily News.

Miss Cutting—"I saw you in the car on your way from the office last night."
Mr. Hogg—"Strange, I didn't see you."
Miss Cutting—"Not at all. I was standing just in front of where you were sitting."—Philadelphia Press.

"They are having an engagement dinner at the Brown's tonight." "Who is engaged?" A new cook."—Judge.

PRESS OF THE HICKS-JUDD COMPANY
SAN FRANCISCO