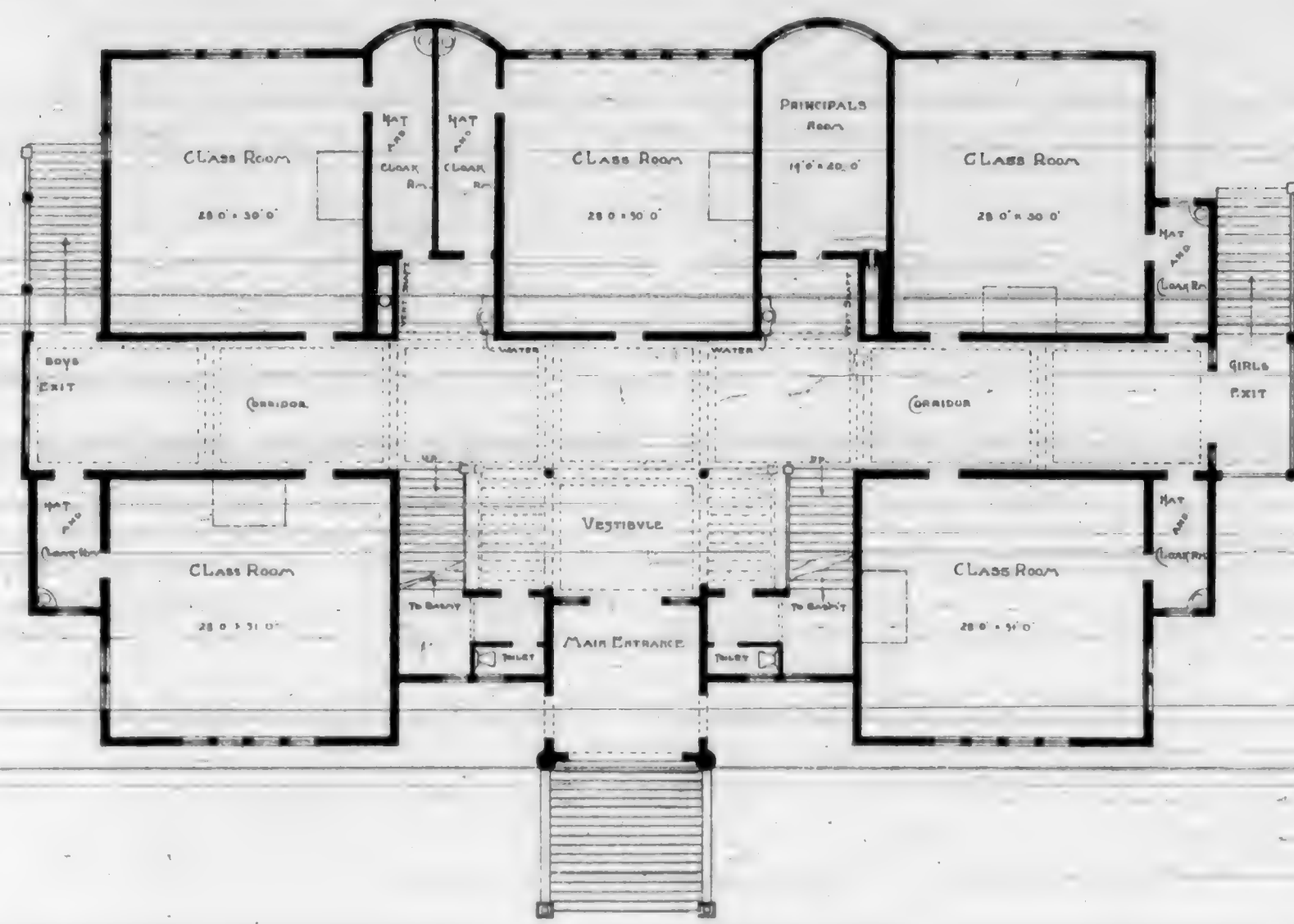
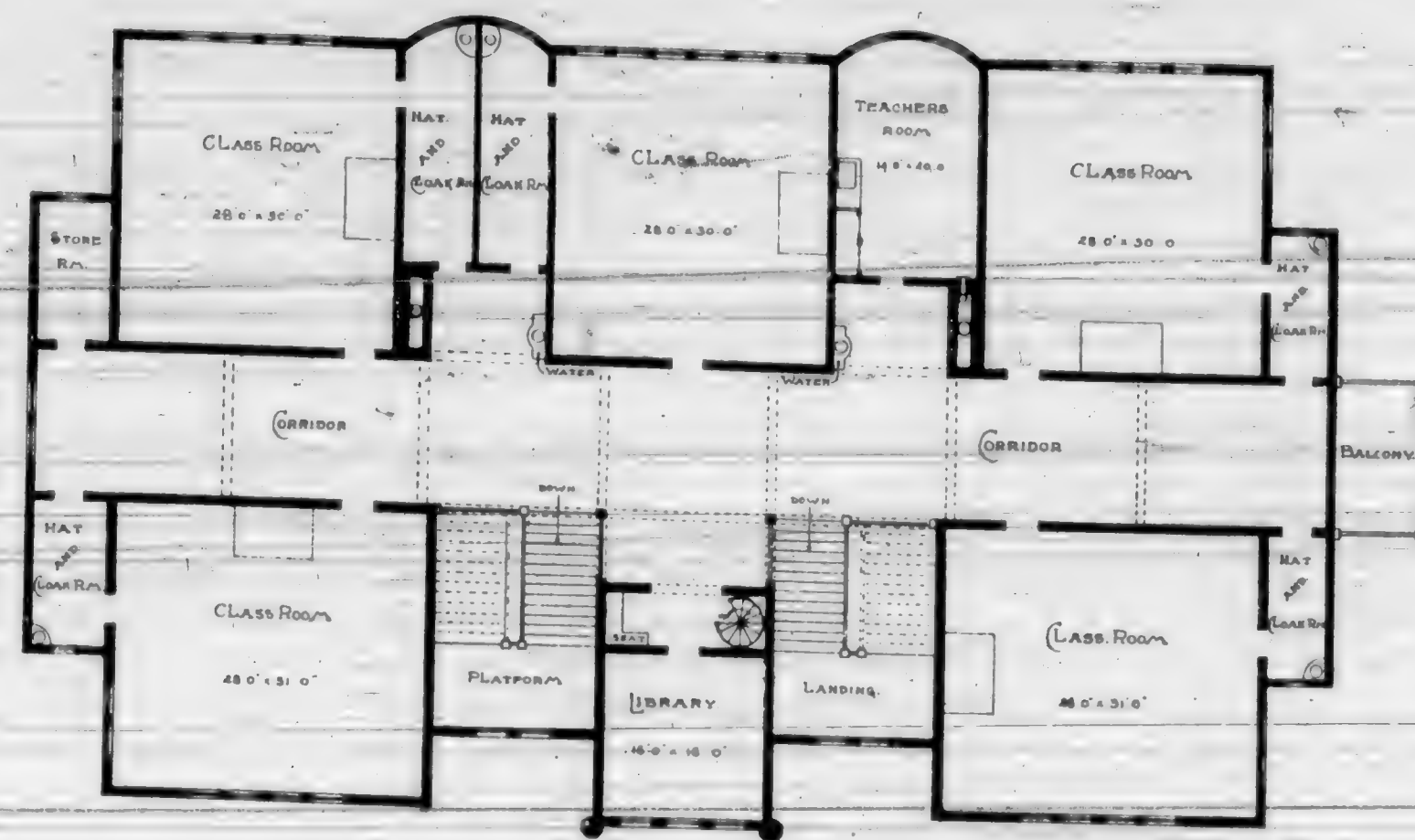
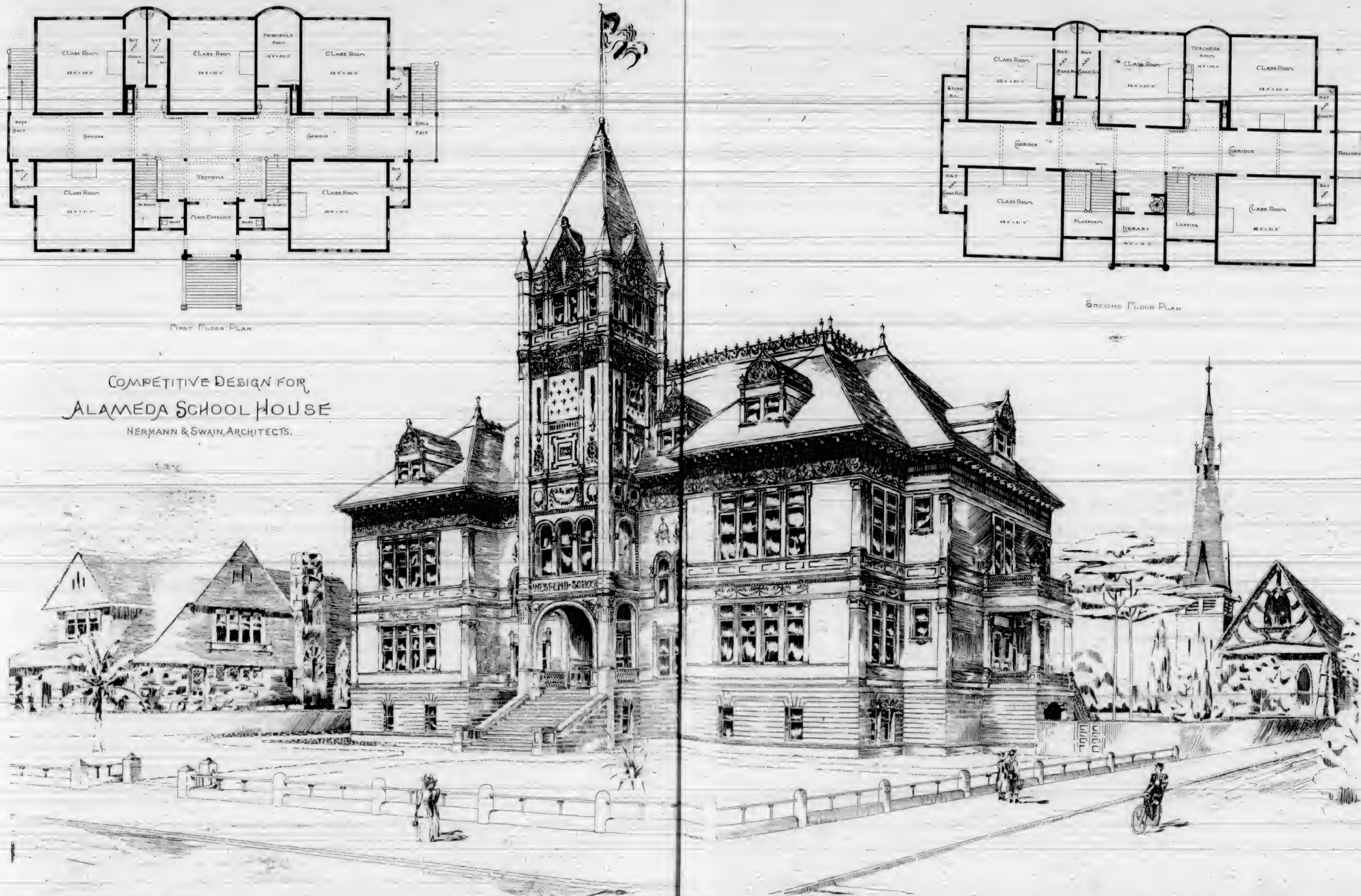


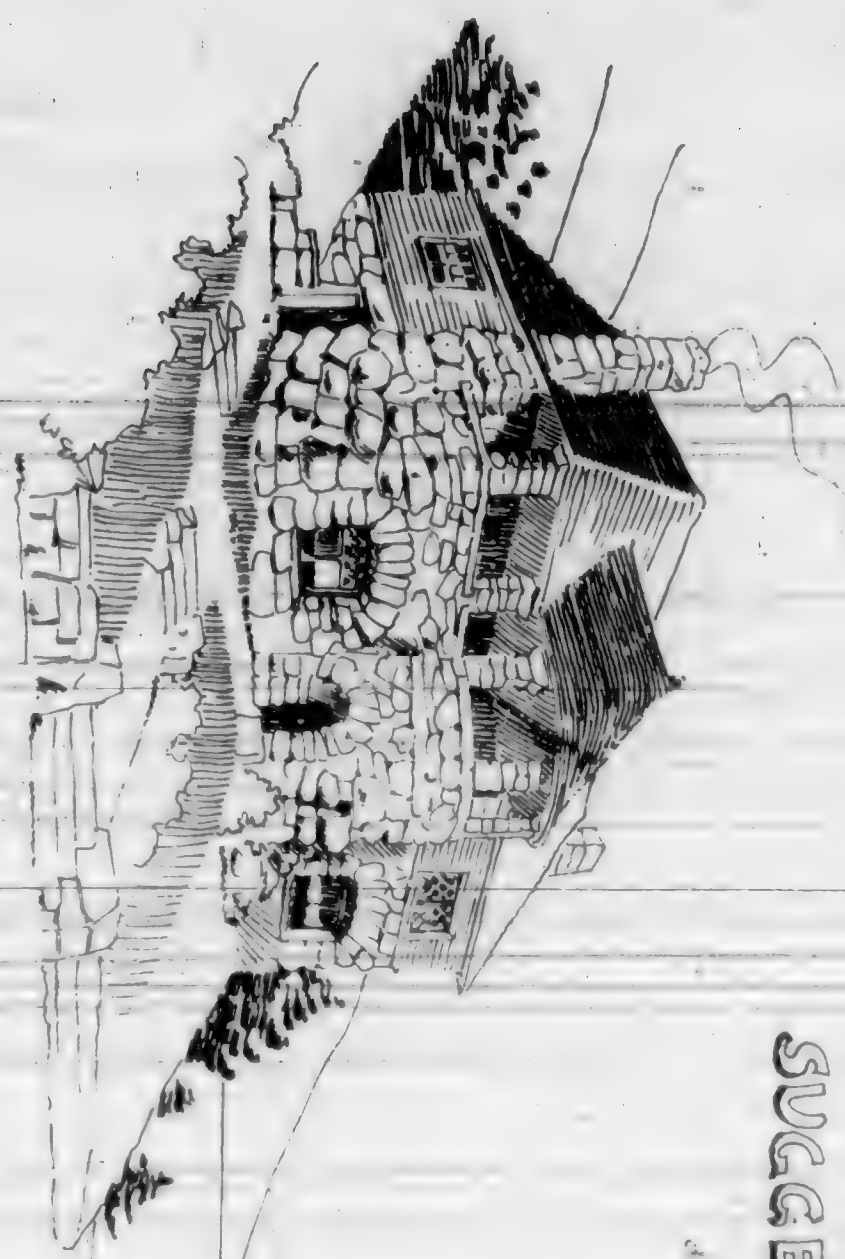


FIRST FLOOR PLAN

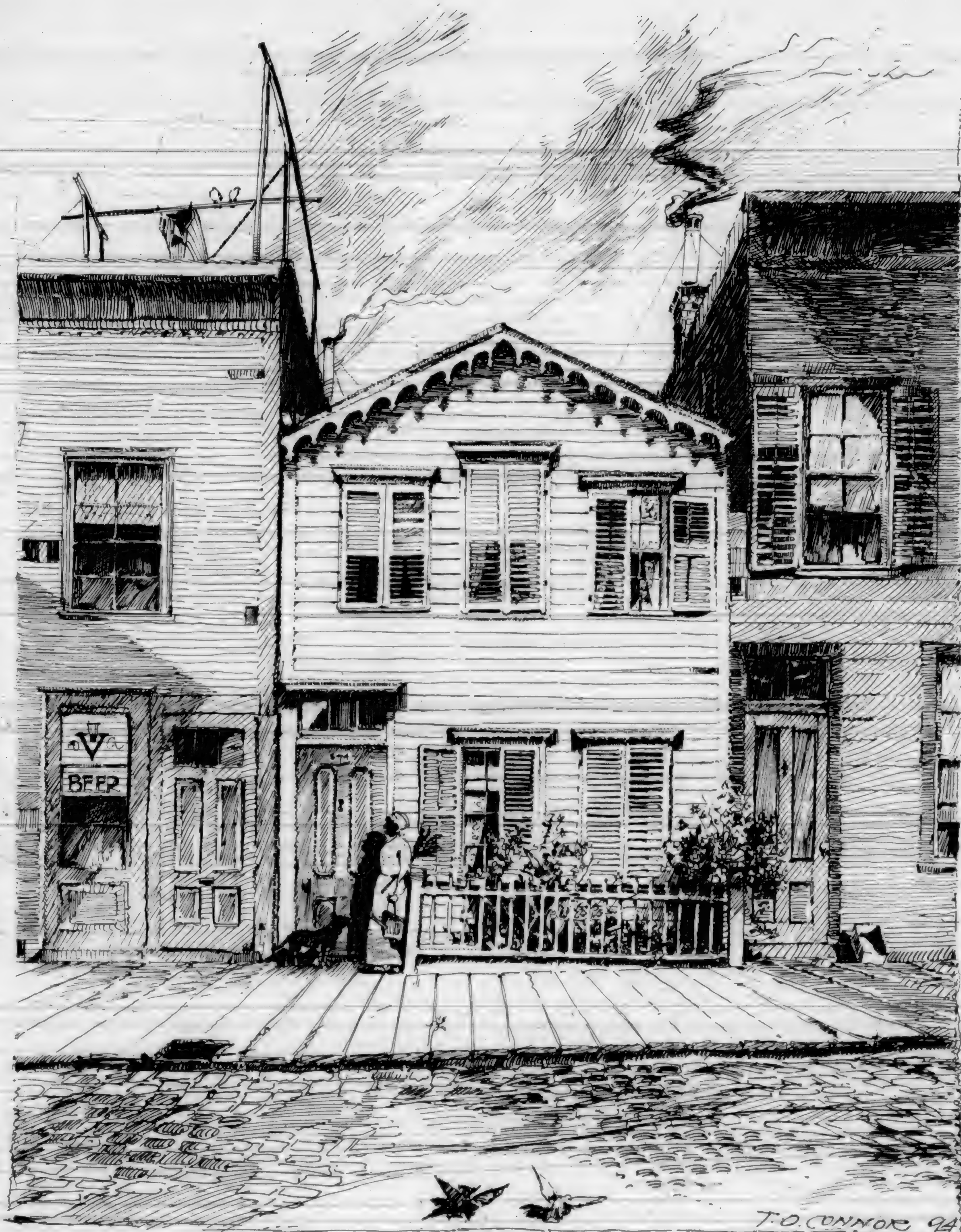
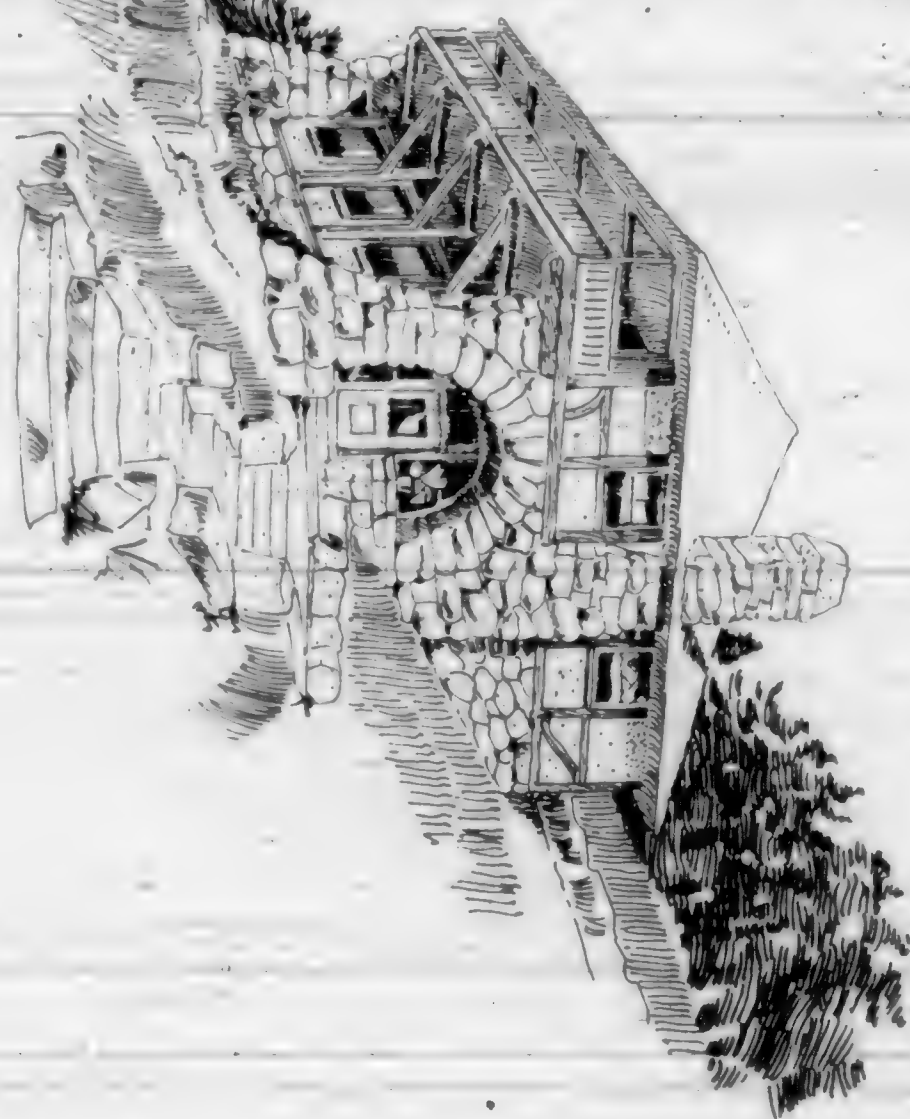
COMPETITIVE DESIGN FOR
ALAMEDA SCHOOL HOUSE
HEYMANN & SWAIN, ARCHITECTS.



SECOND FLOOR PLAN



SUGGESTIONS IN STONE -
POINT TIBURON.



NOTICE OF MEETINGS.

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

SOUTHERN CALIFORNIA CHAPTER AMERICAN INSTITUTE OF ARCHITECTS, meets first Wednesday of each month at 114 Spring street, Los Angeles, Cal.
 OCTAVIUS MORGAN, Pres. A. M. EDELMAN, Vice-Pres.
 ARTHUR B. BENTON, Sec. AUGUST WACKERBARTH, Treas.

TECHNICAL SOCIETY OF THE PACIFIC COAST, meets first Friday of each month at Academy of Sciences Building.
 C. E. GRUNSKY, Pres. GEO. W. DICKIE, Vice-Pres.
 OTTO VON GELDERN, Sec. W. C. RALSTON, Treas.

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

SOUTHERN CALIFORNIA CHAPTER OF THE AMERICAN INSTITUTE OF ARCHITECTS.

THE regular semi-annual meeting of the Southern California Chapter of the American Institute of Architects, was held Wednesday evening, February 6, 1895.

The Treasurer's report was read and showed the finances to be in good condition; other reports are to be submitted at the semi-annual banquet to be given shortly. The report of the committee to act in regard to the Legislative Bill to regulate the practice of architecture in the State was given, and the same committee, Messrs. Morgan, Preston and Benton was authorized to send another delegation to the Capitol if in their judgment such action was necessary.

The report of the special committee on banquet was received, and the committee continued.

The semi-annual election of officers resulted in the re-election of Octavius Morgan to his fourth term as President, and the re-election of Messrs. Edelman and Wackerbarth, Vice-President and Treasurer respectively. The Secretary and Corresponding Secretary are elected at the annual meeting in August.

The new board of directors are Messrs. Morgan, Edelman, Benton, Wackerbarth, Aiken, Burton, Preston and Walls.

BUILDERS' CONTRACT OF THE BUILDERS' EXCHANGE OF SAN FRANCISCO, CALIFORNIA.

ARTICLES OF AGREEMENT.

MADE this—day of—one thousand eight hundred and—between—of the—County of—, State of California, the part of the first part, and—of the—County of—, State of California, the part of the second part.

WITNESSETH:—The part of the first part will be hereinafter designated as the Owner, and the part of the second part as the Contractor, singular number only being used; and the word Architect used herein in the singular shall include the plural, and the masculine the feminine.

FIRST.—The Contractor agrees, within the space of—working days from and after—to furnish the necessary labor and materials, including tools, implements and appliances, required, and perform and complete in a workmanlike manner all the—and other works shown and described in and by, and in conformity with the plans, drawings and

specifications for the same made by—the authorized Architect employed by the Owner, and which are signed by the parties hereto.

SECOND.—Said Architect shall provide and furnish to the Contractor all details and working drawings necessary to properly delineate said plans and specifications; and the work is to be done and the materials furnished in accordance therewith under the direction and supervision and subject to the approval of said Architect, or a superintendent selected and agreed upon by the parties hereto, within a fair and equitable construction of the true intent and meaning of said plans and specifications.

THIRD.—The time during which the Contractor is delayed in said work by the acts or neglects of the Owner or his employees, or those under him by contract or otherwise, or by the acts of God which the Contractor could not have reasonably foreseen and provided for, or by stormy and inclement weather which delays the work, or by any strikes or like trouble among mechanics or laborers which delay said work and which are not caused by, or the continuance of which is not due to any unreasonable acts or conduct on the part of the Contractor, shall be added to the time for completion as aforesaid.

FOURTH.—Said building—to be erected upon a lot of land situated in—County of—, State of California, and described as follows:—

FIFTH.—The Owner agrees, in consideration of the performance of this agreement by the Contractor, to pay, or cause to be paid, to the Contractor, his legal representatives or assigns, the sum of—dollars in United States Gold Coin, at the times and in the manner following, to-wit:—

PROVIDED, that when each payment or installment shall become due, and at the final completion of the work, certificates in writing shall be obtained from the said Architect, stating that the payment or installment is due or work completed, as the case may be, and the amount then due; and the said Architect shall at said times deliver said certificates under his hand to the Contractor, or, in lieu of such certificates, shall deliver to the Contractor, in writing, under his hand, a just and true reason for not issuing the certificates including a statement of the defects, if any, to be remedied, to entitle the Contractor to the certificate or certificates. And, in the event of the failure of the Architect to furnish and deliver said certificates, or any of them, or in lieu thereof of the writing aforesaid, within three days after the times aforesaid, and after demand therefor made in writing by the Contractor, the amount which may be claimed to be due by the Contractor, and stated in the said demand made by him for the certificate, shall, at the expiration of said three days, become due and payable, and the Owner shall be liable and bound to pay the same on demand.

In case the Architect delivers the writing aforesaid in lieu of the certificate, than a compliance by the Contractor with the requirements of said writing shall entitle the Contractor to the certificate.

SIXTH.—For any delay on the part of the Owner in making any of the payments or installments provided for in this contract after they shall become due and payable, he shall be liable to the Contractor for any and all damages which the latter may suffer; and such delay shall, in addition, operate as an additional extension of the time for completion aforesaid for the length of time of such delay. And such delay, if for more than five days after the date when said payments or installments shall have respectfully become due and payable, as in this agreement provided, shall, at the option of the Con-

tractor, be held to be prevention by the Owner of performance of this contract by the Contractor.

SEVENTH.—The specifications and drawings are intended to co-operate, so that any work exhibited in the drawings and not mentioned in the specifications, or *vice versa*, are to be executed the same as if both mentioned in the specifications and set forth in the drawings, to the true intent and meaning of the said drawings and specifications when taken together. But no part of said specifications that is in conflict with any portion of this agreement, or that is not actually descriptive of the work to be done thereunder, or of the manner in which the said work is to be executed, shall be considered as any part of this agreement, but shall be utterly null and void.

EIGHT.—Should the Owner or the Architect, at any time during the progress of the work, request any alterations or deviations in, additions to, or omissions from, this contract or the plans or specifications, either of them shall be at liberty to do so, and the same shall in no way affect or make void this contract; but the amount thereof shall be added to, or deducted from, the amount of the contract price aforesaid, as the case may be, by a fair and reasonable valuation. And this contract shall be held to be completed when the work is finished in accordance with the original plans, as amended by such changes, whatever may be the nature or extent thereof.

NINTH.—The rule of practice to be observed in the fulfillment of the last foregoing paragraph (eight) shall be that, upon the demand of either the Contractor, Owner or Architect, the character and valuation of any or all changes, omissions, or extra work, shall be agreed upon and fixed in writing, signed by the Owner or Architect and the Contractor, prior to execution.

TENTH.—Should any dispute arise between the Owner and Contractor, or between the Contractor and Architect, respecting the true construction of the drawings or specifications, the same shall in the first instance, be decided by the Architect; but should either of the parties hereto be dissatisfied with the justice of such decision, or should any dispute arise between the parties hereto respecting the valuation of the extra work, work done, or work omitted, the disputed matter shall be referred to, and decided by, two competent persons who are experts in the business of building,—one to be selected by the Owner or Architect, and the other by the Contractor; and in case they cannot agree, these two shall select an umpire, and the decision of any two of them shall be binding on all parties.

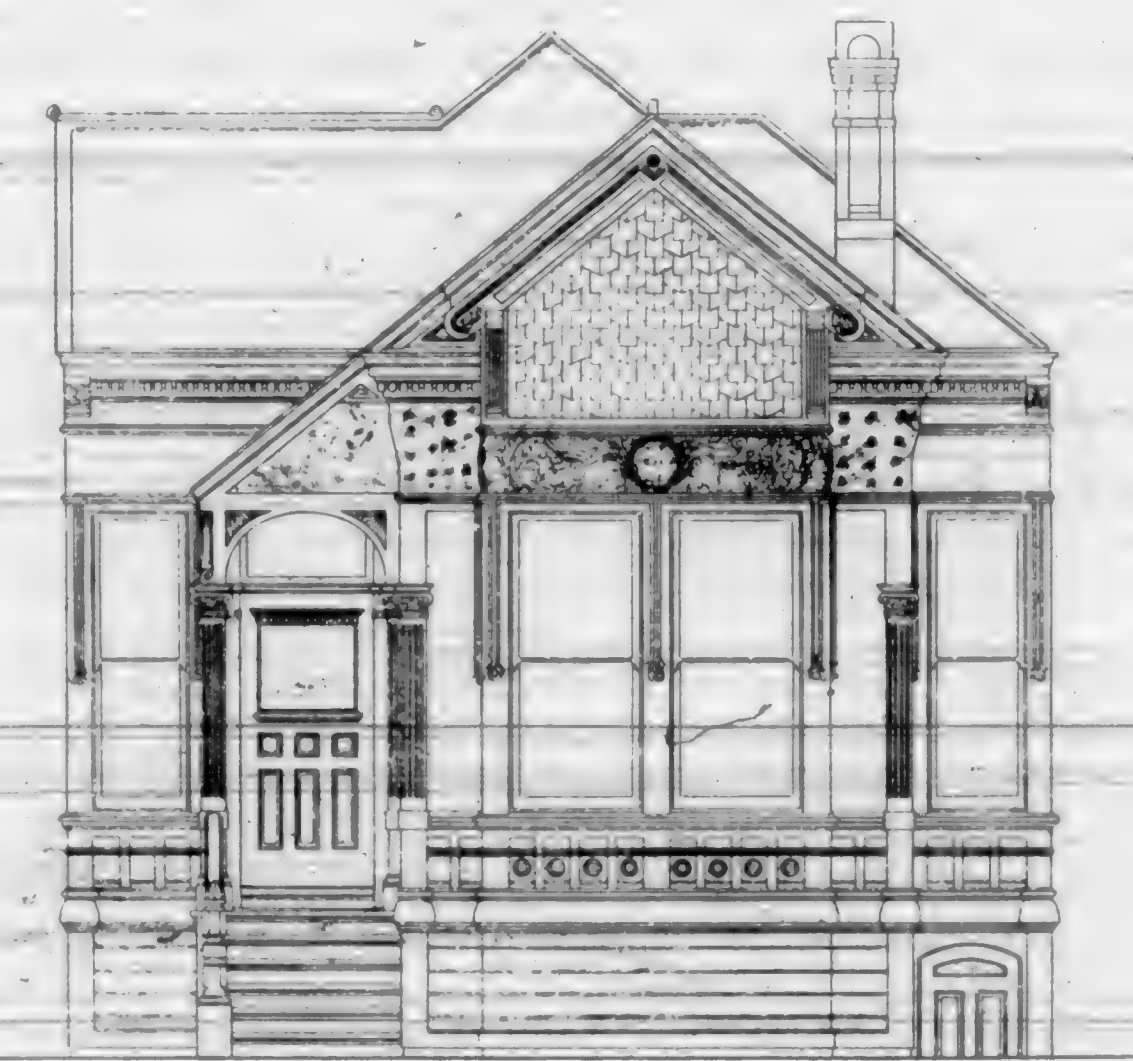
ELEVENTH.—Should the Contractor fail to complete this contract, and the works provided for therein, within the time fixed for such completion, due allowance being made for the contingencies provided for herein, he shall become liable to the Owner for all loss and damages which the latter may suffer on account thereof, but not to exceed the sum of \$—per day for each day said works shall remain uncompleted beyond such time for completion.

TWELTH.—In case said work herein provided for, should, before completion, be wholly destroyed by fire, defective soil, earthquake or other act of God which the Contractor could not have reasonably foreseen and provided for, then the loss occasioned thereby shall be sustained by the Owner to the extent that he has paid installments thereon, or that may be due under the fifth clause of this contract; and the loss occasioned thereby and to be sustained by the Contractor, shall be for the uncompleted portion of said work upon which he may be engaged at the time of the loss,

and for which no payment is yet due under said fifth clause of this contract.

In the event of a partial destruction of said work by any of the causes above named, then the loss to be sustained by the Owner shall be in the proportion that the amounts of installments paid or due bears to the total amount of work done and materials furnished, estimated according to said contract price, and the balance of said loss to be sustained by the Contractor.

THIRTEENTH.—The payment of the progress-payments by the Owner, shall not be construed as an absolute acceptance of the work done up to the time of such payments; but the entire work is to be subject to the inspection and approval of the Architect or Superintendent at the time when it shall be claimed by the Contractor that the contract and works are completed; but the Architect or Superintendent shall exercise all reasonable diligence in the discovery, and report to the Contractor as the work progresses, of materials and



FRONT ELEVATION.

labor which are not satisfactory to the Architect or Superintendent, so as to avoid unnecessary trouble and cost to the Contractor in making good defective parts.

FOURTEENTH.—Should the Contractor at any time during the progress of the work, refuse or neglect, without the fault of the Owner, Architect or Superintendent, to supply sufficiency of materials or workmen to complete the contract within the time limited herein, or any lawful extension thereof, for a period of more than three days after having been notified by the Owner in writing to furnish the same, the Owner shall have power to furnish and provide said materials or workmen to finish the said work; and the reasonable expenses thereof shall be deducted from the amount of the contract price.

IN WITNESS WHEREOF, the said parties to these presents have hereunto set their hands and seals, the day and year first above written.

[SEAL]

BOOKS AND PERIODICALS.

SAN FRANCISCO MUNICIPAL REPORTS for the fiscal year 1893-1894 ending June 30, 1894, published by order of the Board of Supervisors of San Francisco. In addition to the official reports this volume contains two pages of illustrations, the portrait of Mayor L. R. Ellert, as well as those of the twelve Supervisors from M. Goodwin of the First ward to James Denman of the Twelfth.

The always welcome ANNUAL REPORT OF THE BOARD OF REGENTS of the Smithsonian Institution, showing the operations, expenditures and condition of the Institution to July, 1893. Our space will not admit of a mention of all the interesting reports contained in this volume, among others that attracted our attention was an article entitled "North American Bows, Arrows and Quivers," by Otis Tufton Mason, fully illustrated, also "Deep-Sea Deposits" by A. Daubree being a review of work of the Challenger Expedition translated from *Journal des Savants*; "How Maps are Made" by W. B. Blakie, cannot fail to interest our geographical friends as well as the public in general; "The Age of the Earth" by Clarence King, but enough, the work must be carefully studied to appreciate its merits.

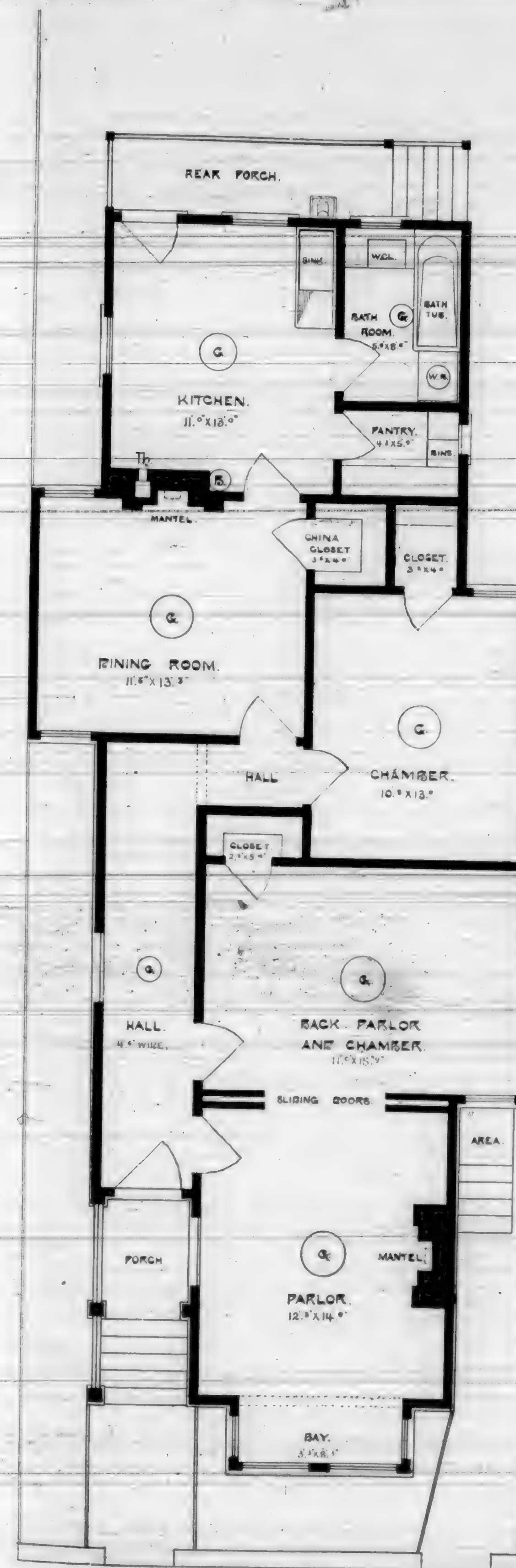
THE PHOTOGRAPHIC TIMES. An illustrated monthly Magazine devoted to the interests of artistic and scientific photography—published at 423 Broome street, New York.

In changing from a weekly journal to a monthly magazine we should judge by the first number that the publishers had made a very successful departure and are certainly to be congratulated for having produced such a beautiful magazine; many of the illustrations are little gems of art.

The amateur photographer as well as the professional are under a debt of gratitude to the editor and publishers of this truly beautiful as well as useful publication, and should pay the debt by becoming subscribers.

FINAL REPORT OF THE CALIFORNIA WORLD'S FAIR COMMISSION, including a description of all Exhibits from the State of California, collected and maintained under Legislative enactments at the World's Columbian Exposition, Chicago, 1893. The Fair Commissioners are to be congratulated upon having given to the public such a handsome volume and with closing their labors in such a creditable manner. In a letter to Gov. H. H. Markham transmitting their report, we notice the following, that certainly is very creditable to our State, with the single exception of that of Illinois, the California building was the largest State building on the Exposition grounds. While maintaining a distinct exhibit in nearly all of the departments or national buildings, such as the Horticultural, Mining, Agricultural and Forestry, the State displayed in her own building so extensive an aggregation of her own products that it was often referred to collectively as "California in miniature," and as an "Exposition in itself."

The illustrations are good and convey a very convincing idea of what California did to represent herself at the World's Columbian Exposition.



FLOOR PLAN

WHAT IS NEEDED TO COMPLETE THE CITY HALL.

FROM a report by Architect Shed we take the following detailed statement of the work that will have to be done to complete the New City Hall:

FIRST.—A permanent fire-proof roof, covering the entire building with the exception of the Hall of Records.

SECOND.—The carrying up of all the main interior walls to a proper height, a satisfactory system of ventilation introduced and all smoke-flues raised above the line of roof-ridges, with all necessary capping, etc.

THIRD.—The performance of all work necessary to complete in every particular the inner dome and rotunda, which includes the placing of an ornamental glass dome at the head of the present interior circular colonnade, all window-glazing, etc., the building of a circular gallery on the line or on the level of each floor of the main building and all ornamental work such as cornices, capitals, railings, wainscoting, pavements, staircases, etc., together with an elevator in the shaft adjoining the rotunda on the westerly line, and continuing to the top of the dome. Three rooms should also be provided in the square shaft on the easterly line adjoining the office of the Mayor and the Board of Education, together with all necessary decorations.

FOURTH.—The general repairing of all injured work in rooms, and especially in the corridors, throughout the entire building.

SIXTH.—Providing for each court-room a steel vault for the reception of valuable documents.

SEVENTH.—Repairing all exterior cast iron work, such as columns, capitals and other minor ornamentations which at this date show the need of such attention.

The cost of the above mentioned work is as follows:

Fire-proof roof.....	\$165,000
Attic walls, flues, skylights, and ventilation.....	55,000
Inner dome and rotunda complete.....	65,000
Elevator from first floor to top of dome.....	11,000
Repairing of all work in rooms and corridors.....	5,000
Plumbing repairs.....	5,000
Steel vaults.....	4,000
Painting, etc.....	5,000
Total.....	\$316,000
Total cost of building to date.....	\$5,049,000
Estimated cost of building, complete.....	\$5,465,000

LEGAL DECISIONS.

LIABILITY OF ACCEPTOR.—Where a contractor entered into a written contract for the erection of a building, and gives an order on the owner in favor of a material man who was furnishing materials for the erection of the building, in payment or security for such materials, payable when the next payment on the contract becomes due, which order was accepted by the owner, in order that he might make such payment or give such security, and also to obtain credit for a further supply of materials for the same purpose and these facts being known to the owner. It was held the object of the acceptance being to assure the further progress of the completion of the contract for the erection of the building, that it established a good consideration as between the owner, and acceptor, and the drawee for the acceptance; and that, upon the completion of the contract to the next payment the owner became liable to pay the order thus accepted and that it was immaterial whether the contractor performed the remainder of the contract or not. If the acceptor of such an order chose to pay the contractor for the erection of the building, as if he had completed the contract

to the next payment, he would be estopped from denying his liability in an action upon the acceptance, when it became due and payable; and so where an order is drawn upon a fund to be paid upon the happening of a condition, which order is accepted, the acceptor cannot either by his own act or by acting in collusion with the drawer of the order, defeat the condition, and then set up such defence as a defense to an action upon the acceptance.

Herter v. Goss & Edsall, Cp., Supreme Court of New Jersey, 30 At. Rep. 252.

LIABILITY FOR NEGLIGENCE OF FELLOW SERVANTS.—Where a workman is injured by the fall of a derrick occasioned by the neglect of another employe in charge of the derrick to provide a check rope, the master is not liable.

Jenkinson v. Carlin, City Court of Brooklyn, General Term, 30 N. Y. Supp. Rep. 530.

MECHANICS' LIENS UNDER AN ENTIRE CONTRACT.—Under an entire contract for the erection of buildings on lots not contiguous to each other, one claim for a mechanics' lien may properly be filed against both improved properties where the claimant of such lien contributed material or labor to both improvements.

Bohn Sash and Door Co. v. Case, Supreme Court of Nebraska, 60 N. W. Rep. 578.

RIGHTS OF ADJOINING OWNERS TO PARTY WALL.—An adjoining owner of a party wall has a right to increase its height; and where he contracts with an independent contractor to have this done in a lawful, proper and usual way, so that the work does not become, in itself, dangerous or extraordinary, and does not subject the existing wall to overweight, he is not liable for the damage incident to the falling of the wall through some accident.

Negus v. Becker, Court of Appeals of New York, 38 N. E. Rep. 290.

THE SUPREME COURT OF IOWA HOLDS, that one acting for an investment company in the construction of a building, under a written agreement requiring him to make all contracts for material and labor in his own name, and to be the party responsible thereon, receiving partial payment in the stock of the company, but reciting that the company desires to employ him "in the construction" of the building, and providing for the letting of contracts by him for work and material "subject to the approval of the company," requiring him to devote his whole time to supervision over such labor and materials, and to furnish the company with a statement of the cost of work and material, and providing that he shall receive ten per cent of the cost of certain labor and material "in full for his services in looking after the execution of said contracts and superintending and supervising the entire construction of the building," will be regarded as a servant of the company, and not an independent contractor.

Hughbanks v. Boston Inv. Co., 60 N. W. Rep. 640.

FACTS CONSTITUTING WAIVER OF ARCHITECT'S CERTIFICATE.—By the terms of a building contract, a certificate was a condition precedent to payment, and upon the fact that such certificate had not been issued by the architect himself, was made the defense of the owner of the building to paying for the work done.

It appears that a certificate was presented, signed by the architect's name, per his assistant, and the claim was made that such certificate was ineffectual to entitle the contractor to payment. But it appeared that the architect with the acquiescence of the owner substituted the assistant for himself in the preparation of the specifications and superintendence of the building; that the architect was never on the premises and never saw the work; that the architect authorized the assistant to issue the certificates; that the owner after making the contract never met the architect, and conducted all his business with the assistant; the extra work was planned and executed by the assistant; that when the latter proposed to furnish the final certificate, the owner made no objection to its issuance by him, but only solicited delay; that other certificates had been so issued and had been paid; and that when the final certificate was issued and presented, he accepted it without objection, and promised to settle next week. The contract also provided that the contractor should permit anyone appointed by the architect to inspect the work. The court held, on the above statement of facts, that the owner had waived the condition of the contract as to the issuance of the certificate by the architect, and assented to the certificates by the assistant, as the clear conclusion of reason and justice.

McEntire v. Tucker, Court Com. Pl., 31 N. Y. S., 672.

BUSINESS MOSAICS.

The J. L. Mott Iron Works, New York, Boston, Chicago, St. Louis and San Francisco; if you refer to page v of this journal you will see what this firm claim to be "The desideratum in modern plumbing," that is to have the various appliances set up open and accessible and wherever possible without cabinet work.

It is only necessary to examine their work to be convinced of the truth of the claim, and every day people are coming to think the same way, as may be seen in the new houses that are constructed upon the most improved plans all contain this open work idea. Information and circulars will be furnished upon application at the San Francisco office, room 35 Flood building, M. S. James Pacific Coast Representative.

Tramp—"I ain't had nothin' to eat for a week, sir. Can't you do suthin for me?" **PEDESTRIAN**—"Certainly; fast for two months and I'll get you a place in a dime museum."—*Harper's Bazar*.

Joseph Budde, the manufacturer of sanitary appliances in the plumbing line is too well known, and has received so many medals and diplomas from the State Fair at Sacramento that it may seem useless to call attention to the excellence of his work, as the popular Golden Gate Patent Water Closet speaks for itself, we need only to call attention to the fact that Mr. Budde can always be found at his ware rooms, 575 Mission street. An inspection of his stock is all that is necessary to secure an order from those in want of his line of goods. See his advertisement on page vii of this journal.

New Yorker (in Washington)—"I have a gold piece in my pocket that—" **Washington**—"Ssh! Keep it dark." **New Yorker**—"Heavens! What's the matter?" **Washington**—"If Cleveland and Carlisle learn that it's there they'll want to borrow it."—*North American*.

California Art Glass Bending and Cutting Works.—The artistic manner in which this firm finishes church memorial windows is worthy of all praise, their exhibit in the Liberal Arts Building at the California Mid-winter International Exhibition was awarded a first prize gold medal. If you visit their show room you will be convinced that what they do, is done well, any work intrusted to their care is sure to turn out to the satisfaction of their patrons. Wm. Schroeder is president of the company, 105 Mission street cor. Spear, San Francisco, Cal.

They have just engaged one of the most celebrated artists in glass staining in the United States, as he just comes from the east where he was employed by some of the largest art glass works, he is full of new ideas which will be an innovation on this coast.

She—"I hope, Oscar, you are not marrying me for my money?" **He**—"Bless you no! My creditors will get all of that."—*Blaetter*.

The Joshua Hendy Machine Works, 39-51 Fremont street will furnish all kinds of castings, light and heavy, as well as architectural iron work; engines and pumps for buildings are also made specialties.

Facts about paint and Duressco the New Wall finish or washable color; this will certainly interest the ladies and therefore we can write about it with interest, what good housekeeper but is particular about her walls, and if she can find a wall finish, or washable water color that damp walls do not effect what more can she want, but in addition to these merits it is claimed by the manufacturers "It strengthens the wall and prevents crumbling" for further information on this subject call upon the manufactures, W. P. Fuller & Co., Pine and Front sts.

American Student—"You don't have football in Germany?" **German Student**—"No; the professors draw the line at duelling."—*Puck*.

Do not forget to specify "Samson Spot Cord" if you want a cord that will do good service, and also one that you can tell at a glance is the true article by its perfection of braid. Samson Cordage works, Boston, Mass., are the manufacturers of this valuable cord.

Judge—"You claim Mr. Coffin as a particular friend of yours?" **Mrs. Killboys**—"Yes, your honor; he buried two of my husbands."—*Judge*.

Kenney & Wells, 422 Sutter street, San Francisco, 408-410 Twelfth street, Oakland, is the place to go for parquet floors, wood carpet, mirrors; frames and pictures, as well as fine fretwork and grills.

"It's the little things that tell," as the man said when his 3-year-old boy saw him kiss the cook and carried the news to mamma.—*New York News*.

W. R. Grace & Co., are agents for the famous Portland Cements "Josson" and "North" 203 California street, San Francisco. If you use cement, get the best, a word to the wise is enough.

Maud—"Don't you think that Mr. Totterly is too old to love?" **MARIE**—"I don't know. But he is rich enough to be loved."—*Ex*.

F. H. Rosenbaum & Co., depot of plate and window glass is at 567 Market street opposite Sansome; they also manufacture mirrors in both styles.

When a man becomes firmly convinced that he is a genius, it is then that the fringe slowly begins to form on the bottom of his trousers.—*Harlem Life*.

Thomas Day & Co., will supply you with gas or electric fixtures, and you are sure to get what you order at 222 Sutter street.

South Streeter—"Jakey, how do you spell life?" **Jakey**—"Vot you dinkin' of, dot leedle flute or de mark on dem tree-tollar pants?"—*Ex*.

If you don't want your door to slam leave order with G. Rischmuller for his door opener and closer.

CITY BUILDING NEWS.

Broderick near Oak. To build; owner, J. D. Sullivan; architect, T. J. Welsh; contractor, Jno. Kemp; signed, Jan. 31; filed, Feb. 4; cost \$2500.

California near Eugenia. To build; owner, John Geherty; architect, M. J. Welsh; contractor, J. E. Schultz; signed, Jan. 10; filed, Jan. 14; cost \$1500.

California near Baker. Plumbing; owner, Mrs. C. F. Clark; architect, W. H. Wharf; contractors, Berwick & Spink; cost \$985.

California near Polk. Alterations and additions; owner, Harriett S. Campbell; architect, W. H. Laffie; contractor, Geo. R. Lang; signed, Jan. 15; filed, Jan. 16; cost \$2100.

Castro near 19th. To build; owner, James Curley; architect, H. B. Roullett; contractors, Rountree Bros.; signed, Jan. 7; filed, Jan. 24; cost \$3500.

Day near Sanchez. To build; owner, M. and E. Schumacher; architect, E. J. Vogel; contractors, Henderlong Bros.; signed, Jan. 25; filed, Jan. 26; cost \$1000.

De Long Ave. near Frederick. To build; owner, Geo. D. Graham; architect, E. J. Vogel; contractor, M. J. Savage; signed, Jan. 13; filed, Jan. 14; cost \$4300.

Eddy near Taylor. Alterations and additions; owner, Silas M. Locke; contractors, Riley & Laine; signed, Jan. 5; filed, Jan. 19; cost \$2172.

Eddy near Taylor. Carpenter and plaster work; owner, Silas M. Locke; contractors, Riley & Laine; signed, Jan. 7; filed, Jan. 16; cost \$1500.

Ellis near Scott. To build; owner, Mary A. Gurness; architects, Townsend & Wyncken; contractor, D. Currie; signed, Jan. 14; filed, Jan. 15; cost \$8900.

Florida near 25th. Additions to Clumbia Grammar School; owner, City of San Francisco; architect, T. J. Welsh; contractors, Constable & Hamilton; signed, Jan. 15; cost \$3100.

Fourteenth near Folsom. To build flats; owner, Elizabeth Beck; contractor, H. R. Schmuckert; signed, Jan. 12; filed, Jan. 14; cost \$4000.

Fulton near Pierce. Plastering, mill work, etc.; owner, Chas. E. Hansen; architect, W. Winterhalter; contractors, Schitt & Kreeker; signed, Jan. 20; filed, Feb. 1; cost \$10,800.

Fulton near Pierce. Painting, graining, etc.; owner, Chas. E. Hansen; architect, W. Winterhalter; contractor, Henry F. Wagner; cost \$1520.

Fulton near Pierce. Excavation, stone, brick work, etc.; owner, Chas. E. Hansen; architect, W. Winterhalter; contractor, Adam Beck; signed, Jan. 31; filed, Feb. 1; cost \$2900.

Fulton near Pierce. Sewers, plumbing, etc.; owner, Chas. E. Hansen; architect, W. Winterhalter; contractors, Shepherd Bros.; signed, Jan. 31; filed, Feb. 1; cost \$1495.

Grave near Schrader. To build; owner, J. J. Butler; architect, F. Butler; contractor, J. Weir; cost \$4500.

Greenwich near Hyde. To build; owners, Paul J. Stuparich and Emily Stuparish; architect, H. Hess; contractors, P. Carmouche & J. Maguire; signed, Jan. 30; filed, Feb. 1; cost \$7200.

Haight near Steiner. To build; owner, Raymo Angelo; contractor, Arthur Stevens; signed, Feb. 4; filed, Feb. 4; cost \$3800.

Harrison near 21st. To build; owner, Michael Bobino; architect, C. M. Rousseau; contractor, Jos. Kennedy; signed, Jan. 31; filed, Feb. 1; cost \$3000.

Hayes near Broderick. Frame building; owner, Henry C. Cieshon; architects, Martens & Coffey; contractor, H. Behrens; signed, Feb. 4; filed, Feb. 8; cost \$3300.

Java and Park Ave. To build; owner, Ella Mezzane; architect, W. H. Amittage; contractor, C. Larsen; signed, Jan. 15; cost \$2032.

Octavia and Hayes. Carpenter work and painting; owner, Mrs. Lizetta Reinle; architects, Stone & Cahill; contractors, Cannon & Thompson; signed, Jan. 10; filed, Jan. 16; cost \$5738.

Lois 10 and 11, block West end map. To build cottage; owner, Miss Lizzie Walker; architect, M. J. Welsh; contractor, I. W. Colburn; signed, Feb. 1; filed, Feb. 2; cost \$1550.

Market near 5th. Gas and electric light fixtures; owner, Miss Emma Spreckles; architects, Reid Bros.; contractors, Bush & Mallett Co.; signed, Dec. 21; filed, Jan. 15; cost \$3500.

Mason near Geary. Stone and brick work on five-story brick building; owner, Hall Association of the N. S. G. W.; architect, A. C. Lutgens; contractors, Liebert & Hoffmann; signed, Jan. 9; filed, Jan. 10; cost \$10843.

Mason near Geary. Terra Cotta Work; owner, N. S. G. W.; architect, A. C. Lutgens; contractors, Steiger Sons; signed, Jan. 15; filed, Jan. 15; cost \$185.

Masonic Ave. near Fell. Two three-story and one two-story frame buildings, ten flats; owner, C. D. Salfeld; days work; cost \$20,000.

McAllister near Masonic Ave. One-story cottage; owner, Julia O'Kane; contractor, James J. Mauseau; signed, Jan. 24; filed, Jan. 24; cost \$1500.

McAllister near Masonic Ave. Two one-story frame dwellings; owner, John Otten; architects, Martin & Coffey; contractor, H. Behrens; signed, Jan. 24; filed, Jan. 24; cost \$2855.

McAllister near Lyon. Two-story frame; owner, Louis Friedlander; architect, J. F. Kenma; contractor, T. C. Cockrune; signed, Feb. 5; filed, Feb. 6; cost \$8350.

Mission near Fourth. Plumbing and gas-fitting on four story brick; owner, A. W. Wilson; architect, J. R. Miller; contractor, R. Rice; signed, Feb. 6; filed, Feb. 9; cost \$1990.

Mission near 4th. Elevator work; owner, A. W. Wilson; architect, J. R. Miller; contractors, Cahill & Hall Elevator Co.; signed, Feb. 5; filed, Feb. 9; cost \$1595.

Pacific Ave. near Octavia. To build; owner, Elizabeth Dore; architect, Sam'l Newsom; contractor, C. L. Emmons; signed, Jan. 15; filed, Jan. 18; cost \$6755.

Pine near Kearny. Mason and carpenter work on two-story brick; owners, J. B. Haggis, Loyd Tevis and Jennie Bull; architects, Keniter & Barth; contractors, Mahoney Bros.; signed, Jan. 11; filed, Jan. 11; cost \$36,000.

Point Lobos Ave. Machinery and disinfesting oven; owners, La Societe Francaise de Reussisance Mutuelle; architect, R. Charney; contractors, Clot & Meese; signed, Jan. 18; filed, Jan. 21; cost \$2625.

Point Lobos Ave. and Boyer. To build; owner, Annie M. Reilly; architect, T. J. Welsh; contractor, D. Emerson; signed, Jan. 28; filed, Jan. 30; cost \$9125.

Point Lobos Ave. and 7th. To build; owner, H. H. Mahan; architects, McDougall & Son; contractor, Wm. W. Farris; cost \$5500.

Reed near Washington. To build; owner, R. D. Cunningham; contractor, G. G. Gillespie; signed, Jan. 14; filed, Jan. 15; cost \$2810.

Sansome near Broadway. Alterations and additions; owner, Kittle & Co.; architect, Clinton Day; contractors, Riley & Loan; signed, Feb. 6; filed, Feb. 6; cost \$4755.

Sanchez near 23d. To build; owner, John H. Eichler & Wilhemina H. Eichler; architect, H. D. Mitchell; contractors, Peterson & Person; signed, Feb. 6; filed, Feb. 8; cost \$3661.

Seventh near Point Lobos Ave. To build; owner, and builder, Geo. Constance; cost \$3000.

Sixteenth and Noe. Remodelling of church; owner, Trinity Methodist Episcopal Church; architect, John Marquis; contractor, J. C. Kelly; signed, Jan. 12; filed, Jan. 26; cost \$2430.

Tenth Ave. near Point Lobos. To build; owner, P. Bergren; contractor, J. L. McLunes; cost \$2500.

Twelfth Ave. near California. To build; owner, Wm. H. Matthews; architect, C. F. Kobestson; contractor, C. Larsen; signed, Jan. 31; filed, Feb. 2; cost \$2890.

Twelfth Ave. and Clement. Plumbing; owner, W. H. Mathews; architect, C. F. Robertson; contractor, G. C. Sweeney; signed, Feb. 2; filed, Feb. 6; cost \$270.

Van Ness Ave. and Jackson. Hollow tile work; owner, Claus Spreckles; architects, Reid Bros.; contractors, Gladding, McBean & Co.; signed, Dec. 21; filed, Jan. 5; cost \$21,570.

Van Ness Ave. near Francisco street. To build; owner, John Mussio; contractor, Miron & Gardner; cost \$1500.

Valencia near Liberty. Completing unfinished building; owner, J. B. F. Davis; architect, J. C. Newsom; contractor, John Furness; signed, Jan. 12; filed, Jan. 12; cost \$2538.

Williamson near Point Lobos. To build; owner, John Moriarty; architects, Shea & Shea; contractor, A. L. Jacobson; signed, Dec. 18; filed, Jan. 17; cost \$1200.

ALAMEDA

Alameda. Additions to Porter School; owner, Board of Education; architects, Laver & Mullany and W. J. Cuthbertson; contractor, P. L. Hansen; cost \$9661.

The California Architect and Building News.

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OFFICE, 408 CALIFORNIA STREET,

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

VOLUME XVI.

MARCH 20th, 1895.

NUMBER 3.

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

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

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INCORPORATED 1889.

NOW IN THE SIXTEENTH YEAR.

W. J. CUTHBERTSON, President.

OLIVER EVERETT, Secretary.

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

ADVERTISING RATES.

Space	1 Month.	3 Months.	6 Months.	12 Months.
1 inch.....	\$ 1.50	\$ 4.00	\$ 7.50	\$ 15.00
2 inch.....	3.00	8.00	15.00	30.00
3 inch.....	4.50	12.00	22.50	45.00
4 inch.....	6.00	16.00	30.00	60.00
5 inch.....	7.50	20.00	37.50	75.00
6 inch.....	9.00	24.00	45.00	90.00
7 inch.....	10.50	28.00	52.50	105.00
8 inch.....	12.00	32.00	60.00	120.00
9 inch.....	13.50	36.00	67.50	135.00
10 inch.....	15.00	40.00	75.00	150.00

F the defeat of the bill introduced into the California Legislature to Regulate the Practice of Architecture, there is little to be said except that the public is not yet educated to the importance of the measure, and the opposition that the bill encountered was mainly from parties who feared their personal interest would be jeopardized.

There is certainly no reason why an architect should not be entitled to the same protection that the lawyer and the doctor have at present under our laws.

The recent collapse of a building in New York whereby many people were killed and injured, the coroner giving as a cause the unskillful construction of the building, should be a warning to the public to intrust their building operations to skillful men, who have shown their ability by their works, as well as by passing an examination before a competent board of examiners, as required by this act.

The sober second thought of the public will eventually compel the Law makers to do justice to the architects and place the profession on the same standing, as the lawyers

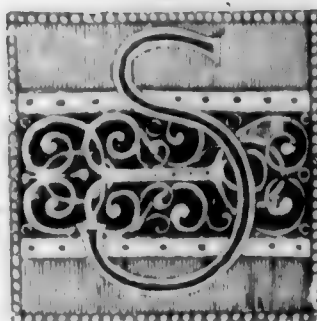
and doctors.

It has been the constant aim of architects of late years to raise the standard of requirements of those anxious to enter the profession. The Royal Institute of British Architects have of late been publishing the requirements of those about to enter the office of the architect, as well as having to undergo three examinations as they progress in their studies before being allowed to membership of the Institute.

In our own country the American Institute of Architects are more exacting every year in the requirements to enter their association; all this shows a very commendable desire upon the part of the leading architects to raise the standard among the profession and secure the proper qualification before admitting members.

This being the case, it would appear that the least the Legislature could do under the circumstances would be to offer some encouragement to those striving to build up our towns and cities in a creditable manner with due reference to the safety of life, security from fire combined with some artistic taste.

We will only add try again and better luck may be the result.



ERIOUS accidents and damages caused by quick running electric cars, calls our attention to the necessity of some different kind of road-bed for them than the present level of the public street.

When the traffic gets any way large in a city it is much put back in its goings and comings by passenger cars and by the same reason passengers by cars are delayed and put in danger by large traffic. It will therefore be absolutely necessary and is now very desirable to clear streets entirely of rapid transit. The cheapest and most desirable way to do this is to place electric cars running overhead in the centre of the roadway—in narrow streets but one line, in broad streets two lines. The lines to be supported on rows of columns in centre of street—the rails only just high enough to clear the highest vehicle with its load—between these rows of columns put a Bicycle track and a path raised above said track for pedestrians who do not wish to look in shop windows and whose definite object is to make fast time. On the right hand side of this track must pass all vehicles going in that direction, on the left hand those coming in an opposite direction to the former—thus no chance for collisions and no confusion. Municipal regulation to arrange all this. The sidewalks need not be then near so wide as at present, having to accommodate only saunterers—so that vehicular traffic will have more leeway and people crossing the street will only have to look in one direction to prevent themselves from being run over.

Iron stairways at each crossing of streets are to run up to small landings above, where passengers will wait for the cars.

The advantages of this system are manifold:

FIRST—Unobstructed and therefore quick run for the cars.

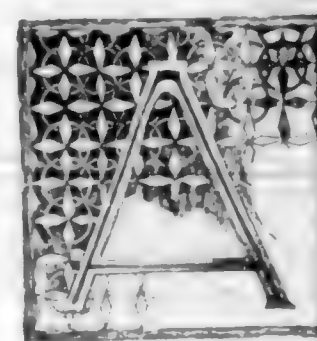
SECOND—No danger therefrom to life or limb.

THIRD—Unobstructed and therefore quick run for vehicles and no danger of collision except at crossings.

FOURTH—Unobstructed and therefore quicker and less dangerous run for Bicyclists.

FIFTH—And most important, danger from cars, vehicles and bicycles to pedestrians at a minimum—getting to the cars from centre walk easier and safer.

SIXTH—Pedestrians who wish to stroll or look at shops not pushed or hustled by those who may be in a hurry and those in a hurry not obliged to make their way through a slow walking crowd.



LITTLE more than thirty years ago, the war cry of "On to Richmond" resounded through the country, to-day there is a prospect that the cry of "On to Richmond" will be renewed in this city, not as a war cry but in behalf of peace and peaceful homes.

Where is Richmond? we hear some one ask. Richmond is bounded on the east by First Ave. that gives promise of becoming the leading Boulevard of our city, connecting the Presidio on the north with the Golden Gate upon the south. This section of our city has recently been sewered and drained in the most through manner and stands to-day as the most perfectly drained portion of our city.

Judging by the number of lots that have been sold the last season, building operations will be very active the coming spring and summer.

As people realize the advantage of living in such a healthy location so easy of access to the business portion of our city, this demand for building lots will increase till the fear of

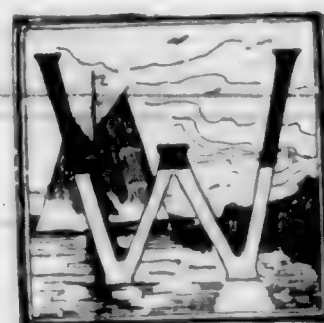
over-crowding will be the only objection. The doctors may object to this, as it is such a healthy place there is not much demand for there services.

If we examine the railway facilities we find them ample, the Sacramento cable road, the steam cars from California street to the Cliff House, as well as the Geary street cable cars all pass through Richmond. The Sutro electric road will soon be added to the number, all affording ample facility for reaching the business portion of San Francisco in a short time.

REPORT OF THE COMMITTEE APPOINTED TO COLLECT DATA OF AUTHENTICATED TESTS ON WASHINGTON BUILDING MATERIALS.

BRICK AND CLAY MATERIALS.

Continued from February Number.



We beg to submit the following tables under the above heading of tests upon brick made at the Watertown Arsenal, and by Mr. Thomson, C. E., City Engineer of Seattle and the Vulcan Iron Works:

MATERIALS CONTRIBUTED AT THE WORLD'S COLUMBIAN EXPOSITION, CHICAGO, ILL.

Compressed surfaces faced with plaster of Paris to secure even bearing in the testing machine.

Test No.	Description	Marks	Dimensions	
			Height	Surface
6532	Everett Electric Brick Co. Light Red Brick		2.28	8.08 3.32
6533	" " " " "		2.11	7.08 3.00
6534	Finning Brick	"We challenge the World for Strength"	2.45	8.98 4.48
6535	Denny Clay Company		2.38	8.89 4.45
6536	Fire Brick		2.31	8.77 4.33
6537	Denny Clay Company		2.37	8.77 4.29
6538	Vitrified Paving Brick		4.23	8.78 2.70
6539	Denny Clay Company		2.61	8.76 4.08
6540	Building Brick	P. S. B. T. and T. C. Company, Seattle, Wash. P. O. Box 472	2.40	8.44 4.23
6541	" " "		2.50	8.52 4.20
6542	" " "		2.39	8.18 4.00
6543	Everett Electric Brick Co.		2.38	8.14 3.96
6544	Pressed Building Brick	E. E. B. Co.	2.46	8.67 4.23
6545	C. A. Sherman, Spokane, Wash.		2.40	8.32 4.07

Test No.	Section at Area Sq. Inch	Weight Dry lbs. oz.	Absorption of Water		By Volume per cent	First Crack lbs.	Ultimate Strength lbs.
			Total lbs. oz.	By Weight per cent			
6532	31.47	4 3/4	18	5.2	31.1	104,000	126,200
6533	27.95	4 1/2	13	5.0	11.1	99,000	216,950
6534	40.23	6 1/4	9 1/2	5.8	11	250,000	505,900
6535	39.56	6 1/4	11 1/2	12	22.1	309,000	519,700
6536	37.97	5 1/2	11 1/2	12.3	22.8	59,900	104,980
6537	37.02	5 1/2	11 1/2	12.3	22.8	43,000	90,450
6538	23.71	7 1/2	12 1/2	0.4	0.86	49,000	288,100
6539	35.74	7 1/2	12 1/2	0.8	1.85	155,000	761,000
6540	35.70	5 1/2	12 1/2	12.2	23.1	114,000	170,200
6541	35.78	5 1/2	12 1/2	13.1	24.1	82,800	108,200
6543	32.72	4 1/4	13 1/2	17.6	30.5	81,900	131,650
6544	32.23	4 1/4	13 1/2	17.6	29.5	81,000	145,800
6545	36.07	5 1/2	19 1/2	22.5	37	89,900	98,800
6546	31.86	5 3/4	13	15.5	27.6	232,000	281,100

Test No.	Section at Area Sq. Inch	Weight Dry lbs. oz.	Ultimate Strength Per Sq. Inch	Remarks
6532	31.47	4 3/4	3984	
6533	27.95	4 1/2	7846	
6534	40.23	6 1/4	12573	
6535	39.56	6 1/4	13137	
6536	37.97	5 1/2	2765	
6537	37.02	5 1/2	2405	
6538	23.71	7 1/2	12151	Tested on edge.
6539	35.74	7 1/2	21293	
6540	35.70	5 1/2	4767	
6541	35.78	5 1/2	3024	
6543	32.72	4 1/4	4005	
6544	32.23	4 1/4	4524	Have sunken panel 4-9x1-9x20.
6545	36.07	5 1/2	2694	
6546	31.86	5 3/4	8302	

Correct:

J. E. Howard

J. W. REILLY,

Major Ordnance Dept. U. S. A. Commanding.

SEATTLE, WASH., Jan. 9, 1894.

Messrs. Charles H. Bebb & C. W. Saunders, Committee on Tests of Washington Building Materials.

GENTLEMEN:—In reply to your request for information touching tests which I have made upon building material manufactured in Western Washington, I would say: My position has been such that my experiments have principally been made upon materials suited for paving and for the lining of sewers, and relate principally to brick.

In October, 1892, a large number of samples were submitted to me for examination in competitive bids for furnishing the lining of our sewer tunnels.

(1) The Denny Clay Company submitted samples of a very dark salt glazed brick, which upon examination and test, gave the following dimensions and behavior:—

Average dimensions, length 8 68-100 inches, width 4 26-100 inches, thickness 2 53-100 inches.

Average weight of brick, dry, 7 lbs. 12 7-8 oz.

Average weight of water absorbed during 72 hours immersion, 2 7-8 oz.

Average percentage of absorption 2 3-10 per cent.

Average specific gravity, 2.27.

One of the brick submitted with the above, showed a percentage of absorption of but 41-100 of one per cent, and had a specific gravity of 2.34, and many of the bricks delivered in our contract were equal in their density, although the average of some 310,000, remained just about the average of the samples. In attempting to crush one of these brick we applied a pressure, of 10,000 lbs. per square inch, and although we destroyed our testing machine, we did not make an impression upon the brick.

(2) The next samples tested were those presented by the Puget Sound Brick Tile and Terra Cotta Company. These brick were of a dark red color, and were made of fairly well pugged blue clay. Under test they showed as follows:—

Dimensions; length 7 68-100 inches, width 3 78-100 inches and thickness 2 26-100 inches.

Weight of brick, dry, 4 lbs. 12 2-3 oz.

Weight of water absorbed during 72 hours immersion, 4 1-6 oz., giving an average percentage of absorption of 5.43 per cent. Their specific gravity was 2.04.

(3) Pontiac Brick and Tile Company submitted samples, which clearly showed that they were poorly ground and poorly burned, and in as much as this company has since that time introduced new machinery, and new methods, the tests of these samples could not be taken as showing the character of present output. They gave as follows:—

Average length: 8 6-100 inches, width 4.00 inch, thickness 2 28-100 inches.

Their average weight was 4 lbs. 13 oz.

The average weight of water absorbed during 72 hours immersion was 11 1-2 oz., and the percentage of absorption 14 94-100 per cent and the specific gravity 1.82.

(4) The Seattle Brick and Tile Company also submitted a very large number of samples. These were of a very dark and dull red color, but were made of a well ground clay, and burned with coal in a down draft kiln.

Their average dimensions were; length 7 92-100 inches, width 3 78-100 inches, and thickness 2 39-100 inches.

Their average weight while dry was 5 lbs. 3 oz.

The average amount of water absorbed 4 1-3 oz., and the average percentage of absorption 5 25-100 per cent and specific gravity of 2 11-100.

Of these latter brick I have used about two million, and of these, the specific gravity has averaged 2 22-100, which is 11-100 better than that of the samples submitted.

Two firms have submitted paving brick, viz: The Denny Clay Co. and the Seattle Brick and Tile Co. The brick presented by the Denny Clay Co. had a specific gravity ranging between 2.21 and 2.35. These brick absorbed 2.29-100 per cent and 1 52-100 per cent of their weight in water respectively. I placed them in a foundry rattler, with about a ton of small sized scrap iron, and revolving the rattler at the rate of twenty-six revolutions per minute, gave them 16,600 revolutions. The softer brick lost 29 per cent of its weight, and the harder one, but 17 per cent, and both still retained, in fair degree, their original shape.

The Seattle Brick and Tile Company's pavers had specific gravities ranging between 2 17-100 and 2 32-100. These were also tested for absorption and showed 4 2-100 per cent and 2 37-100 per cent respectively, and when placed in rattler and given 16,600 revolutions, in connection with above one ton of scrap iron, they showed less of weight of 34 6-10 per cent and 15 6-10 per cent respectively.

From the above experiments I am able to say that we have in the vicinity of Seattle, clays, which under fair and reasonable treatment, will yield as perfect a brick as any I have been able to find from any place in the world.

Very truly yours,

R. H. THOMPSON.

THE VULCAN IRON WORKS CO.

SEATTLE, WASH., Sept. 21, 1894.

To Whom it May Concern:—

We have made the following tests of brick at the requests of the Seattle Brick and Tile Co., viz:—

End Cut Brick No.	Commenced to Crack.	Crushed.
	Lbs. per sq. in.	Lbs. per sq. in.
1	2500	3150
2	2500	2500
3	2500	2500
4	2500	2500
5	2500	2500
6	2500	2500
7	2500	2500
8	2500	2500
9	2500	2500
10	2500	2500
11	2500	2500
12	2500	2500
13	2500	2500
14	2500	2500
15	2500	2500
16	2500	2500
17	2500	2500
18	2500	2500
19	2500	2500
20	2500	2500
21	2500	2500
22	2500	2500
23	2500	2500
24	2500	2500
25	2500	2500
26	2500	2500
27	2500	2500
28	2500	2500
29	2500	2500
30	2500	2500
31	2500	2500
32	2500	2500
33	2500	2500
34	2500	2500
35	2500	2500
36	2500	2500
37	2500	2500
38	2500	2500
39	2500	2500
40	2500	2500
41	2500	2500
42	2500	2500
43	2500	2500
44	2500	2500
45	2500	2500
46	2500	2500
47	2500	2500
48	2500	2500
49	2500	2500
50	2500	2500

Machine got stuck at 2800 lbs. per sq. inch and did not crush it, in testing End Cut Brick No. 2. We herewith testify to correctness of the above tests.

Yours very truly,

THE VULCAN IRON WORKS CO.

Per J. Hume,

Manager.

Your Committee begs to point out that the lists just read comprise tests made upon the materials manufactured by a very limited number of factories compared to the entire number in the State. Investigation demonstrates that there is not a State in the Union richer in all varieties of clay beds from the highest grades of pure Kaolin and fire clays, to the commonest low grade brick earth. The above tests though made upon material manufactured in the infant development of the clay industry in this State, compare favorably with tests made upon similar materials manufactured by any of the Eastern States, and competition among home manufacturers assures architects, owners and builders of yet higher grades in all lines of clay building materials. We are satisfied that the day has passed when the railroad companies will receive fifty per cent of the cost of high class clay materials, as the State of Washington has now within its limits more than one factory producing pressed brick, terra cotta and fire-proofing equal in quality to anything produced in the East.

We recommend the appointment of a new Committee to further investigate into the clay working industries of the State of Washington, that they prepare and submit a report upon the subject at the next annual convention embracing a record of tests made by acknowledged experts, and in order

that these tests may be really serviceable and valuable to the architects and manufacturers, we advise that a paper of suggestions for the conduct of tests upon various clay materials be prepared by them and a copy furnished the different manufacturers of clay products. Such suggestions coming from a body of men forming indirectly the chief consumers of their products will, we believe, be received in good part.

LUMBER.

After the careful paper prepared by Mr. C. B. Talbot and read at our last regular meeting, it would seem there is not much left to be said under the above heading. If confirmation was necessary his paper confirms the fact that the State of Washington has almost unlimited stores of the finest lumber in the world for constructional purposes. Your Committee herewith submits the list of tests given by Mr. Talbot and made under his supervision, and has added thereto a table of ultimate fiber strains developed by each stick.

EXPERIMENTS ON ACTUAL BREAKING LOADS IN POUNDS ON YELLOW FIR AND OTHER TIMBERS CAREFULLY SIZED—BY C. B. TALBOT AND OTHERS.

Size	Length	Clear Span	Deflection	Age	Breaking Load	Lbs. per sq. in.
2x4 in.	4 ft.	3 ft. 9 in.	1 in.	6 yrs.	3063	6891.55
2x4 "	4 "	3 " 9 "	1 "	3 mos. (half dry fine gr)	3062	6888.5
2x4 "	4 "	3 " 9 "	1 "	hard gr. fine	4320	9720
2x4 "	4 "	3 " 9 "	1 "	clear "	3635	8178.75
2x4 "	4 "	3 " 9 "	1 "	12 " 1 "	3338	7555.5
2x4 "	4 "	3 " 9 "	1 "	1 yr. dry	2274	5116.5
2x4 "	4 "	3 " 9 "	1 "	Coar d'Alene Pine 1 yr. dry	1610	3622.5
2x4 "	4 "	3 " 9 "	1 "	Eastern White Pine 1 yr. dry	2128	5403.

EXPERIMENTS BY MR. HART AND OTHERS.

Size	Length	Clear Span	Deflection	Age	Breaking Load	Lbs. per sq. in.
6x14 "	16 "	15 " 9 "	31 "	1 day cut	29635	7257.55
8x16 "	20 "	19 " 0 "	1 "	1 "	45600	7910.15
9x16 "	20 "	19 " 0 "	1 "	6 yrs. old (in bridge)	24488	4938.75
8x16 "	16 "	15 " 9 "	26 "	1 day cut (fine close gr)	43704	9817.05
8x16 "	16 "	15 " 9 "	26 "	6 yrs. old	36704	7982.45
9x16 in.	20 "	19 " 0 "	1 "	1 day cut	34635	6988.18
8x16 "	20 "	19 " 0 "	1 "	6 yrs. old	49008	9149.1
8x14 "	20 "	19 " 0 "	1 "	fresh cut cross grained	37041	5953.01

This last specimen was selected as the worst possible sort and was so cross grained as to be entirely cut off one in three-and-a-half feet.

In working out these strains your Committee has taken the full length of the stick instead of clear span, the clear span would, of course, have given slightly higher results.

Herewith we also submit the lists of tests kindly furnished by the *Puget Sound Lumberman*.

RAILWAY TESTS OF DOUGLASS FIR.

Following is the result of tests of Washington fir made at mills at St. Paul and Tacoma Lumber Company, Tacoma, Wash., on March 12th and 13th, 1890, by A. J. Hart, Master Mechanic of the Chicago, Milwaukee and St. Paul Railway Company, Milwaukee, under the direction of John T. Crocker, general purchasing agent, and B. W. Smith, timber agent of said road. At the tests made, Messrs. D. D. Clark, F. M. Haynes and C. B. Talbot, representing the Northern Pacific Railroad Company, were present and assisted in said tests:

Size of Stick	Length of Span	Moduli of Rupture	Fibre Strain
6x15 1/2 in.	18 ft.	25,284.57	5,391.1
6x14 "	15 " 9 in.	29,635.3	7,144.2
6x14 "	11 "	39,111.	6,585.
6x14 "	15 "	26,794	6,151.7 dry stick
8x16 "	19 "	45,277	7,560.9
9x16 "	19 "	25,094.	3,724.93 6 yrs old
8x16 "	16 "	39,672.75	5,591.63 3 " "
8x16 "	15 " 9 "	54,722.76	7,458.41
8x16 "	19 "	32,104.3	5,263.5 dry stick
9x16 "	19 "	38,568.27	5,571.09
8x14 "	19 "	34,963.3	5,338.1
8x14 "	19 "	16,250.13	3,544.35 cull

The greatest deflection in any of these sticks was 3 1/2 inches. The least deflection in any of these sticks was 1 1/2 inches. In all these tests the centre load was applied.

TESTS OF FIR. RESULTS OF THE SECOND SERIES.

Further tests of the strength of fire lumber have been made by S. Kedzie Smith, city engineer of Ballard, and the *Lumberman* herewith gives the results. The tests were for transverse strength. The lumber, which was furnished by the Stimsen Mill Co., was forty days air seasoned and a little above the grade of good merchantable lumber. It was no better than would enter into good building construction. The bearing of the load on the beam was eighteen inches long and curved to a radius of six feet.

No. of Test Piece	Size of Piece	Span between end supports	Breaking load	Stress in extreme fiber
7.	21-5-16x7 1/2	8 feet	1,000	32
8.	31-10x8	8 feet	2,000	32
9.	3x8	8 feet	1,000	32
10.	2,001	32	2,000	32
11.	2,001	32	2,000	32
12.	4,000	32	4,000	32
13.	4,000	32	4,000	32
14.	6,000	32	6,000	32
15.	6,000	32	6,000	32
16.	8,000	32	8,000	32
17.	8,000	32	8,000	32
18.	10,000	32	10,000	32
19.	10,000	32	10,000	32
20.	10,200	32	10,200	32

Breaking load Stress in extreme fiber 6,800 lbs. 5,310 " 10,200 lbs. 7,500 " 10,880 lbs. 8,160 "

10	11	12	13	14
3 1-16x12-1/2	3x12	4x11-1/2	4x12-1/2	4x11-1/2
12 ft.	12 ft.	12 ft.	12 ft.	12 ft.
1,000	32	1,000	2	1,000
2,000	32	2,000	32	2,000
4,000	32	4,000	32	4,000
6,000	32	6,000	32	6,000
8,000	32	8,000	32	8,000
10,000	32	10,000	32	10,000
11,000	32	11,000	32	11,000
12,000	32	12,000	32	12,000
13,000	32	13,000	32	13,000
14,000	32	14,000	32	14,000

Breaking load Stress in extreme fiber 12,800 lb. 6,138 " 11,400 lb. 5,700 " 12,300 lb. 4,710 " 14,000 lb. 5,140 " 14,400 lb. 5,630 "

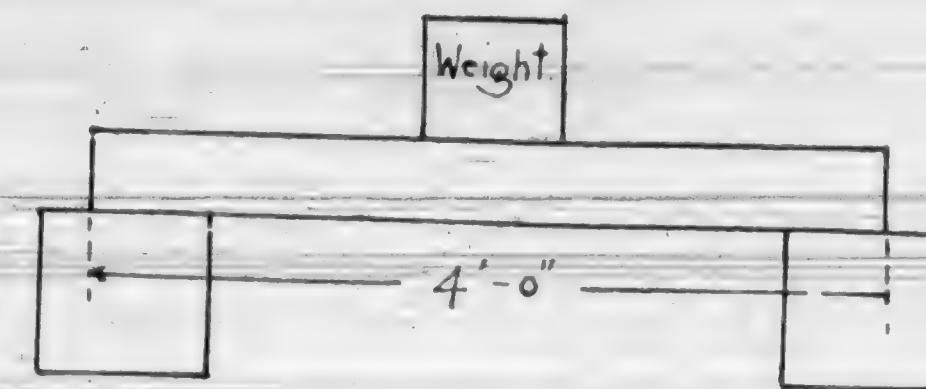
15	16
3x12	3x12
14 ft.	14 ft.
1,000	1,000
2,000	2,000
4,000	4,000
6,000	6,000
8,000	8,000
10,000	10,000
12,000	12,000
14,000	14,000

Breaking load Stress in extreme fiber 10,200 lb. 4,905 " 9,400 lb. 4,255 "

Test No. 7 was a coarse-grained red fir.
Test No. 8 a close-grained yellow fir, near outside of log.
Test No. 9 a close-grained yellow fir similar to No. 8; lower edge close to sap.
Test No. 10 a medium fine-grained red fir; near outside of log.
Test No. 11 a coarse-grained red fir.
Test No. 12 a coarse-grained red fir.
Test No. 13 a coarse-grained red fir.
Test No. 14 a coarse-grained red fir.
Test No. 15 a coarse-grained red fir.
Test No. 16 a very coarse-grained red fir.

REPORT OF H. H. WARNER.

As to the strength of our fir, I, with others, witnessed a test made by Engineer C. B. Talbot of the woods used in car and bridge building, viz: Fir, eastern pine and oak. Pieces were selected of good quality, 2x4 inches, 4 feet long, and tested as illustrated:



The following was the breaking pressure:

Fir	4,320 lbs.
Eastern oak,	2,428 "
Eastern pine,	1,610 "

It will be noted that the tables of ultimate fiber strains run the same average in the lists. It is perhaps not in the province of this Committee to give the fiber strains of woods grown outside of the State. It may be sufficient to point out that yellow Washington fir heads the list published in the *Puget Sound Lumberman* of all woods used for constructional purposes in regard to strength.

There are some points that your Committee wish to draw the attention of the Chapter to. The wide variation in the strength of the same material shown in the lists just read is one of them. The ultimate fiber strains vary from about 4,000 lbs. to nearly 10,000 lbs. per sq. in.; under these conditions does the Chapter consider that a sufficient number of tests have been made from which to adopt a reliable standard. It is a noteworthy fact, that as far as your Committee has been able to discover, there is not one hand-book of Engineering or Architecture that gives any information whatever in regard to Washington fir. We think this is an important fact which deserves consideration by the Chapter. Another point we wish to make is that we are informed that the cutting of trees and the logging business is carried on for the most part in the spring and summer of the year. It is perhaps hardly necessary to go back to the first writer extant on the subject of Architecture, but we find Vitruvius in the year 25 B. C. strongly condemning the practice. No timber to be used in important constructional work should be cut from growing trees while the sap is permeating every branch. Timber should be cut between the months of November and March. We are satisfied that sticks sawed from winter cut trees and properly seasoned will, when tested, show the best results; and as the use of such timber is only in conformity with the best engineering practice, we respectfully suggest the appointment of a Committee to draw up a resolution to that effect to be indorsed by the Chapter now in session.

Your Committee is satisfied beyond a doubt, that the tests so far made that have come to our knowledge, while showing high average results, do not do justice to Washington fir. Trantwine, Hatfield, Rankin, Laslett, and others give the moduli of rupture of *spruce* beams as from 8100 lbs. per sq. in. to 11,100 lbs. per sq. in., and of common white pine as from 10,000 to 13,000 lbs. per sq. in., no doubt derived from tests made upon small specimens, the results being necessarily larger than if derived from tests of full size timbers, as the smaller pieces do not contain as many imperfections as always occur in larger ones. Professor Lanza of the Massachusetts Institute of Technology, however, made

some tests on full sized sticks of pine and spruce and the average of sixty-eight experiments gave only 5046 lbs. per sq. in. fiber strains, thus justifying the doubt as to the utility of the fiber strains given by the above mentioned authorities, even for ordinary work. There can be no doubt in the mind of any person acquainted with the three mentioned woods, that yellow fir should develop at least twice the strength of either of the others, which so far has not been the case. Architects and Engineers are still in the dark as to what average fiber strain per sq. in. they may safely adopt for our firs, and consequently, what factor of safety they may use.

We beg also to point out that it has long been considered that it is better engineering to determine as the safe load of a timber beam or joist, the load that will not deflect it more than a certain fraction of its span, in other words to take the bending moment in preference to the modulus of rupture. We are of opinion that the known data is insufficient from which to make a reliable table of deflection under given loads.

Finally we would suggest that further tests be made under the direction of some competent Committee appointed by the Chapter and from these and former tests, some standard be recommended for adoption, and that the information, when obtained, be forwarded to such well known authorities as Trantwine, Kaswell, Hatfield, Kidder, etc., to be published at their discretion in the annual editions of their hand-works.

Your Committee has not had the time to carry their investigations into the other building materials of the State, and while we realize how incomplete this report is, we have done the best with the time at our disposal.

Respectfully submitted,

CHARLES W. SAUNDERS) Committee.
CHARLES H. BEBB)

THE EXAMINATION FOR ADMISSION TO CANDIDATURE: AN HISTORICAL NOTE.

Continued from February Number.

THE first Examination under By-Law XIV. was held in March 1882, and two others were held the same year, in July and November, under the charge of a Board appointed by the Council, the regulation being that the number on such Board should not be less than five Fellows nor more than twelve. As a matter of fact, the first Board of Examiners in Architecture which ever met at the Institute were appointed in November 1880, and consisted of the President (the late John Whichcord), the three Vice Presidents (Professor Hayter Lewis, the late Sir Horace Jones, and Mr. Ewan Christian), the Hon. Secretary (Mr. Macvicar Anderson), with Messrs. James Brooks, Arthur Cates, E. A. Gruning, E. H. Martineau, E. R. Robson, Alfred Waterhouse and T. H. Watson. The newly-appointed Board conducted the last of the Voluntary Architectural Examinations; and, at the meeting of the 20th May 1881, Street, who was then President, occupied the Chair. His immediate successor in the presidential office—the late Sir Horace Jones—presided over the Board at the first Examination under By-Law XIV. held in March 1882, vacating it at the Oral Examination in favour of Mr. Arthur Cates, who has been periodically re-appointed Chairman of the Board, and has conducted almost every Oral Examination since the beginning of that year.

Five years after the introduction of Examinations under

By-Law XIV.—a By-Law made under the provisions of the Charter granted to the Institute by William IV.—a second Charter repealing some of the provisions of the earlier one was obtained from Her Majesty the Queen in Council. The grant was made by a Deed executed 28th March 1887, and the third section of this Charter contains the words "From the date of this our Charter every person desiring to be admitted an Associate shall be required to pass or have passed such Examination or Examinations as may be directed by the Royal Institute." Power was given at the same time, under Section 21, to grant Diplomas and Certificates in connection with Examinations, and to make By-Laws which should define, regulate, and prescribe the relations of the Institute to other Societies having kindred aims and purposes.

A few months after the grant of the new Charter an important Conference of Architects was held in London. At one of the meetings held 4th May 1887, it was recommended: (1) That the Institute should undertake the guidance and direction of professional education; (2) that a scheme of a complete system of examination should be prepared; (3) that such system should comprise a Preliminary, an Intermediate, and a Final or Qualifying Examination; and (4) that this system of Progressive Examination should be arranged with the co-operation of local Societies in the United Kingdom. At another meeting, held the next day, it was further recommended that the Institute should be the centre of any federation of the members of the profession within the British Empire, and that such object might be best attained by connecting the various local Societies which existed, or which might thereafter be formed, with the Institute. Other cognate matters were discussed by the Conference, but the two above signalled were the most important. A great deal of minute and careful attention was given to both subjects in the course of the two subsequent sessions, and the scheme of Progressive Examination was approved by a Special General Meeting of the Institute, held 8th April 1889. At the same meeting the Architectural Societies of Bristol, Leicester, Liverpool, Manchester, Nottingham and Sheffield, with the Royal Institute of the Architects of Ireland, the Glasgow Institute, and the Northern Architectural Association—nine in all—were admitted to alliance with the Institute under the provisions of By-Laws then recently approved by the Privy Council. Since that time six other bodies in England, Scotland and Wales, with another in Australia, have been similarly admitted to alliance; with what results may be seen in the *Kalendar* last issued to members. The same issue of this work gives the fullest description yet published of the three Progressive Examinations. At the present hour the Probationers number 631, the Students 130; and the number of those eligible for candidature as Associate exceeds 100, with a reserve of 113 applicants relegated from previous occasions, and having the right of admission to the "Final" to be held next March and subsequent Qualifying Examinations.

The above applies only to the class of Associate. All the machinery in force, all the efforts to aid the education of architects and of architectural students, all that is sketched in the foregoing review, concerns admission to candidature as Associate. But the new Charter of 1887, under Section 3, lays down that from the 28th March 1892 the Institute shall have power to declare that every person desiring to be admitted a Fellow shall also be required to have passed an Examination. Although nearly three years have elapsed, the only "Examination" for admission to candidature as

Fellow is contained in a "Regulation" for carrying into effect By-Law 3; that after the 1st November 1893 every such person shall submit to the Council, as evidence of his abilities as a practising architect, drawings, or photographs, of his executed works, accompanied with a signed declaration that the said works have been designed by himself. Since that Regulation was passed thirteen persons, of whom ten were already members in the class of Associate, have been elected Fellows; while, during the same period, 76 Associates have been added to the Register. The number of Associates is now 373, and there are more than 100 candidates, 64 of whom passed the recent Examination, eligible for election to that class; while the Fellows, who in October 1892 numbered 617, and in January 1893, 621, now number 611. Before the next Annual General Meeting it may be confidently anticipated that the number of Associates will far exceed 900, while that of the Fellows will show little increase. One of the main results of the Charter of 1887 is an apparent shifting of the preponderance of power, in the ordinary affairs of the corporate body, from the Fellows to the Associates of the Institute.—*Journal of the Royal Institute of British Architects.*

SAN JOAQUIN RAILROAD.

IN the December number of this journal we had occasion to speak of the lack of enterprise shown by the Real Estate men of our city, and remarked if they had any pluck the San Joaquin Railroad would be well under way by this time. Since that time we are happy to say they have in a measure redeemed themselves and at the present time there is every prospect of a competing road being soon under way.

If this should meet the eye of any who have not yet subscribed to this deserving enterprise we hope they may be induced forward as they may gain the public weal by adding their names to the subscription list without waiting to be called upon.



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

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

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

COMPETITIVE Design, Alameda City Hall, W. J. Cuthbertson, Architect.

A COUNTRY Hotel, W. D. Van Sieten, Architect, San Jose, Cal.

PERSPECTIVE of California Safe Deposit Building, Henry A. Schulze, Architect.

BUILDING for A. W. Wilson & Co., Mission street between Third and Fourth Sts., J. R. Miller, Architect.



COMPETITIVE DESIGN.

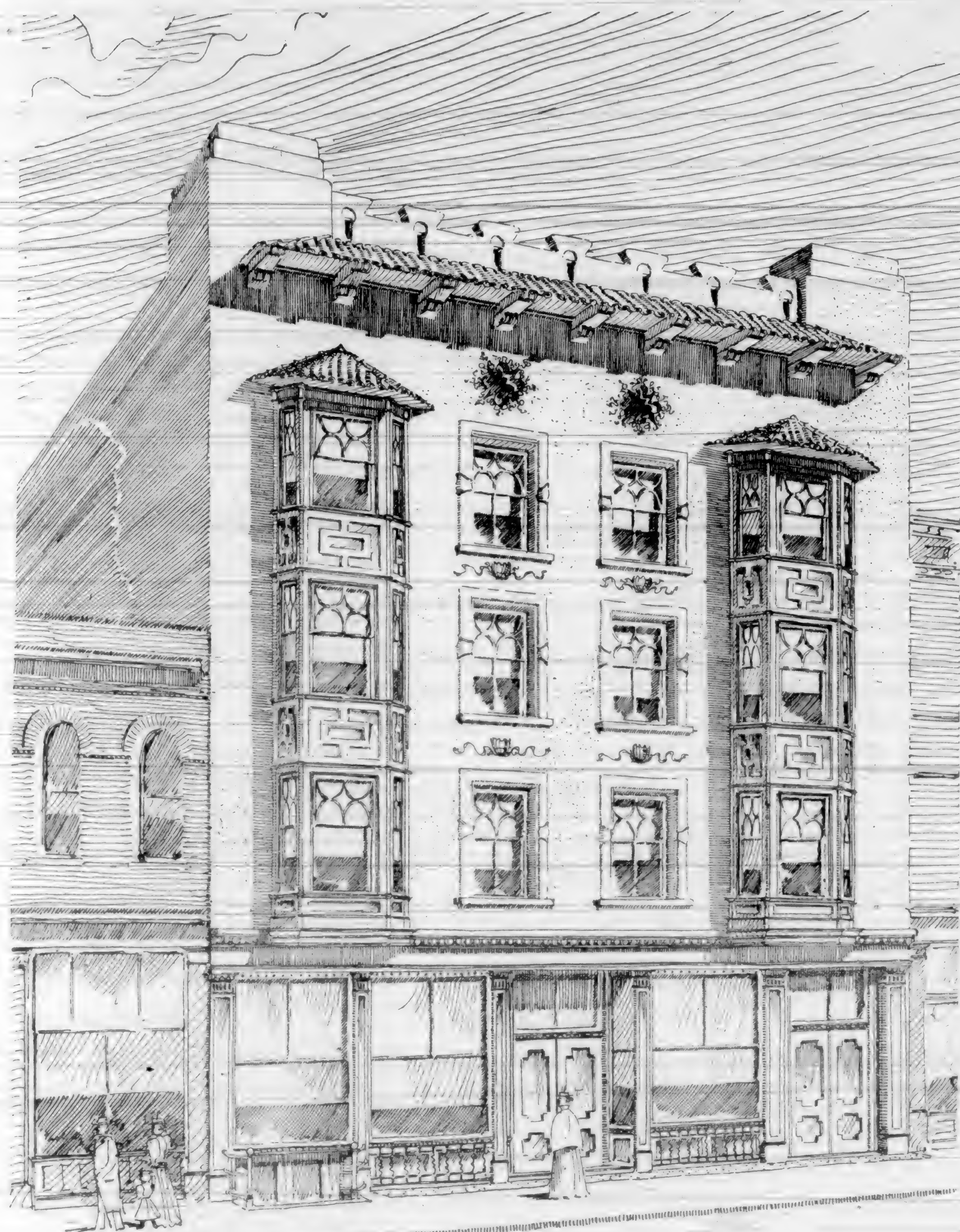
ALAMEDA
CITY HALL



CALIFORNIA ARCHITECT & BUILDING NEWS
SAN FRANCISCO.

BRITTON & REY PHOTO LITH.

VOL. XVI NO. 3 MARCH 1895.

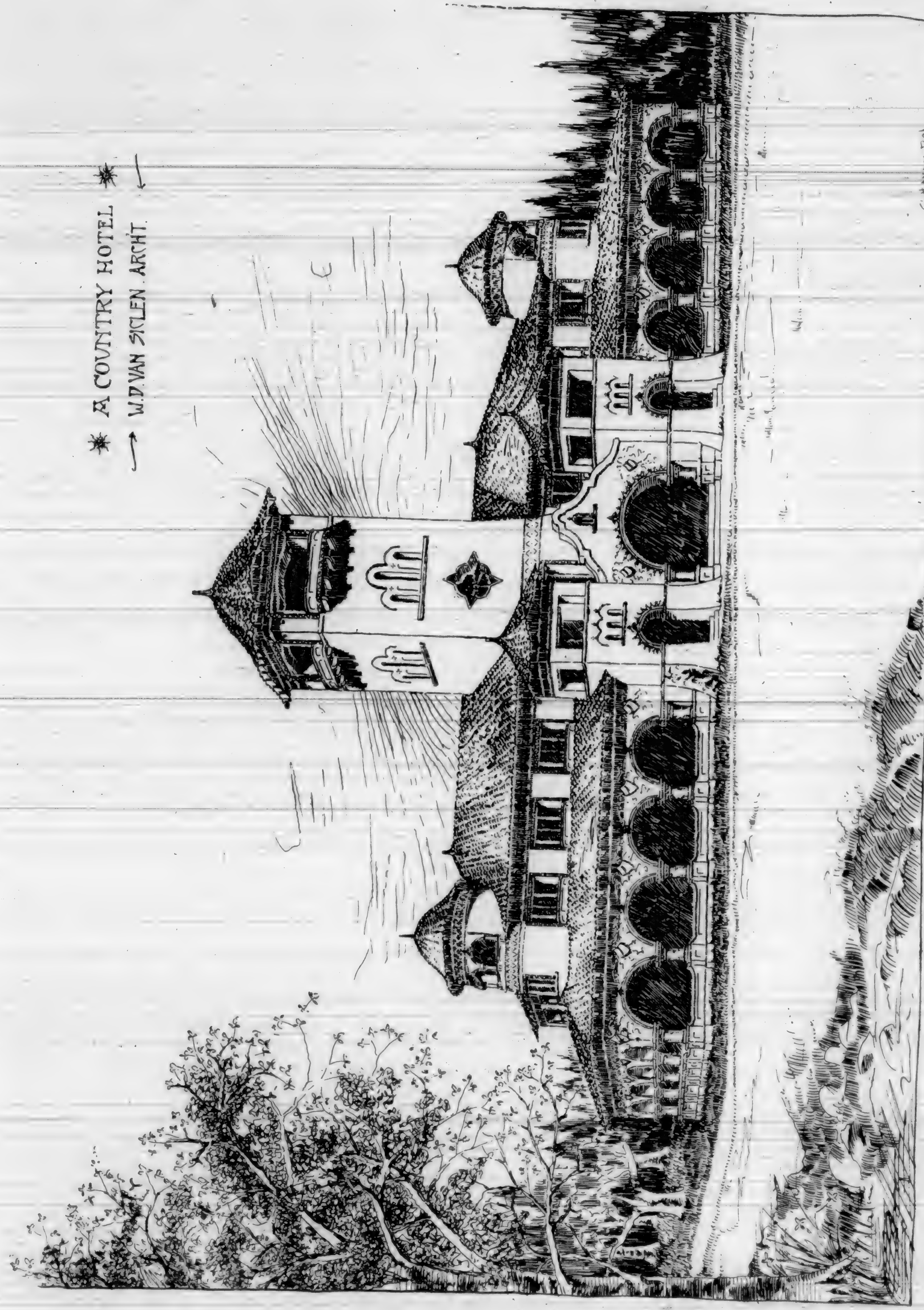


-- BUILDING FOR A.W. WILSON ESQ --
 -- MISSION ST. BET. 3^d & 4th STS. --
 -- J.R. MILLER ARCHT CROCKER BLDG. SF. --

PERSPECTIVE OF CAL. SAFE
 DEPOSIT & TRUST CO. BUILDING.
 HENRY A. SCHVITZ ARCHT.
 FLOOD BUILDING RM 94.
 SAN FRANCISCO CAL.



* A COUNTRY HOTEL *
 — W. VAN SLEN ARCHT. —



CALIFORNIA ARCHITECT & BUILDING NEWS
 SAN FRANCISCO

BRITTON & REY PHOTO LITH.

CLAYTON DEL

VOL. XVI NO. 3 MARCH 1895

NOTICE OF MEETINGS.

SAN FRANCISCO CHAPTER, AMERICAN INSTITUTE OF ARCHITECTS, meets second Friday of each month at 409 California street.
 SETH BARSON, Pres. GEO. W. PERCY, Vice-Pres.
 OLIVER EVERETT, Sec. JOHN M. CURTIS, Treas.

SOUTHERN CALIFORNIA CHAPTER, AMERICAN INSTITUTE OF ARCHITECTS, meets first Wednesday of each month at 114 Spring street, Los Angeles, Cal.
 OCTAVIUS MORGAN, Pres. A. M. EDELMAN, Vice-Pres.
 ARTHUR B. BENTON, Sec't. AUGUST WACKERBARTH, Treas.

TECHNICAL SOCIETY OF THE PACIFIC COAST, meets first Friday of each month at Academy of Sciences Building.
 C. E. GRUNSKY, Pres. GEO. W. DICKIE, Vice-Pres.
 OTTO VON GELDERN, Sec. W. C. RALSTON, Treas.

CALIFORNIA ELECTRICAL SOCIETY, meets the first and third Monday evenings of each month at the Academy of Sciences Building.

GEO. P. LOW, Pres. C. O. POOLE, Vice-Pres.
 MAX CASPARI, Sec. H. T. BESTOR, Treas.

PRACTICAL SUGGESTIONS RESPECTING THE VENTILATION OF BUILDINGS.

A REPORT TO THE STATE BOARD OF HEALTH. BY JOHN H. KELLOGG, M. D.

GENTLEMEN:—In obedience to your request, I herewith present in brief form a few suggestions and fundamental principles which it is believed may be found of service in arranging the ventilating system of public and private buildings. The sole effort has been to embody, in as brief and lucid a form as possible, the information which the writer has gathered during some years of study of the subject, and such facts as he has gleaned from his own experience in planning and superintending buildings of some size for hospitals and other purposes. The only recommendation offered for the plans and principles suggested is that they have borne the test of practical experiment in a satisfactory manner, which cannot be said respecting all the schemes for the warming and ventilation of buildings which have been offered in works on sanitary subjects published within the last score of years. In justice to himself, the writer ought to say that he has not undertaken to make this paper exhaustive, or anything more than what its title indicates; neither has he undertaken to enter the field which properly belongs to the architect, but rather to present simply such suggestions and theories as he has himself found of practical value, and which are susceptible of general application, omitting altogether the minor details, which, however necessary to the adaptation of a general plan or principles to any particular case, are likely to be of little service except in the special conditions to which they are specially adapted. Seeking, then, to avoid as much as possible, redundancy of language and circumlocution in methods of presentation, let us begin at once the discussion of the things most essential in a correct scheme for the proper ventilation and heating of a building.

First of all, it may be stated that the ventilation and heating of a building must be considered together, for a successful working of each will depend upon the conditions of the other. It needs no argument to impress the fact that the amount of heat to be furnished in any given instance must depend very largely upon the amount of fresh air to be supplied per hour or minute. If the air of a room is to be changed four times per hour, certainly a proportionately larger quantity of fuel must be consumed than if the air is to be changed but once an hour.

The air supply of a room or building is generally deter-

mined by its size rather than by the number of persons by which it is to be occupied. This is certainly not a scientific method. A large room, occupied by but one or two persons, might possibly admit through cracks about windows and doors, and through its porous walls a sufficient air supply; while a small room, crowded with people, would require a very large provision for the supply of fresh air. The first thing, then, to be considered in the study of the ventilation of a room or building is the number of persons who are to occupy the space under consideration.

According to the most eminent sanitary authorities of England, each healthy adult person requires not less than three thousand cubic feet of air per hour. This statement is based upon careful experiments, which showed that if the normal quantity of carbon di-oxide contained in the atmosphere, which is two parts to every five-thousand parts of air, is increased to three parts in five thousand of air, the limit of tolerable impurity is reached; that is, if the amount of CO₂ is increased by respiration to a larger proportion than that stated, namely, three parts in five thousand, the air thus contaminated becomes productive of disease. It must not be supposed that the poisonous properties of such air are due to the chemical compound CO₂. Air may contain a much larger proportion of CO₂ provided this compound is derived from purely chemical sources, without injury being apparent. But when the CO₂ is furnished by the respiration of animals, there is association with it a subtle poison, which has been shown by the eminent physiologist, Prof. Brown-Sequard, to be one of the most powerful poisons known, exceedingly minute quantities being sufficient to produce death.

A little computation based upon the experiments referred to will show that Dr. Parke's figures are certainly not extravagant. With each breath, each human being exhales into the air one cubic inch of carbon di-oxide, and a definite amount of organic poison associated with it. As air naturally contains two cubic inches of carbon di-oxide in every five thousand cubic inches of air, and as an additional cubic inch of CO₂ or three cubic inches in five thousand cubic inches of air is the limit of safety, it is evident that each breath renders unfit for further use, five thousand cubic inches, or approximately, three cubic feet of air. The average person breathes eighteen times per minute; consequently each person spoils or renders unfit for further use, 3x18, or 54 cubic feet of air per minute; 54x60 gives us, as the amount of air which each person contaminates per hour, 3240 cubic feet, a slight excess over the amount named by Prof. Parkes. Some other authorities place the line of dangerous contamination at a somewhat higher point, and consequently they require a smaller amount of air. Avoiding either extreme, we may place the amount of air required per hour for each healthy person, at about 2400 cubic feet. It must be understood, however, that this rule applies to healthy persons only, and it is not applicable to hospitals or buildings occupied by infirm or sick persons. For such institutions, and for manufacturing establishments in which the air may be contaminated by chemical or other processes, at least double the amount named, or 5000 cubic feet of air per hour must be supplied. In any given case then, to ascertain the amount of air required per hour, we have only to multiply 2400 or 5000 as the case may be, by the number of persons to be supplied with air. The number of persons taken should be the maximum rather than the minimum number which the room or building is calculated to accommodate, for the evident reason that the capacity of a ventilat-

ing shaft, duct or opening, may be easily diminished, but cannot be so readily increased.

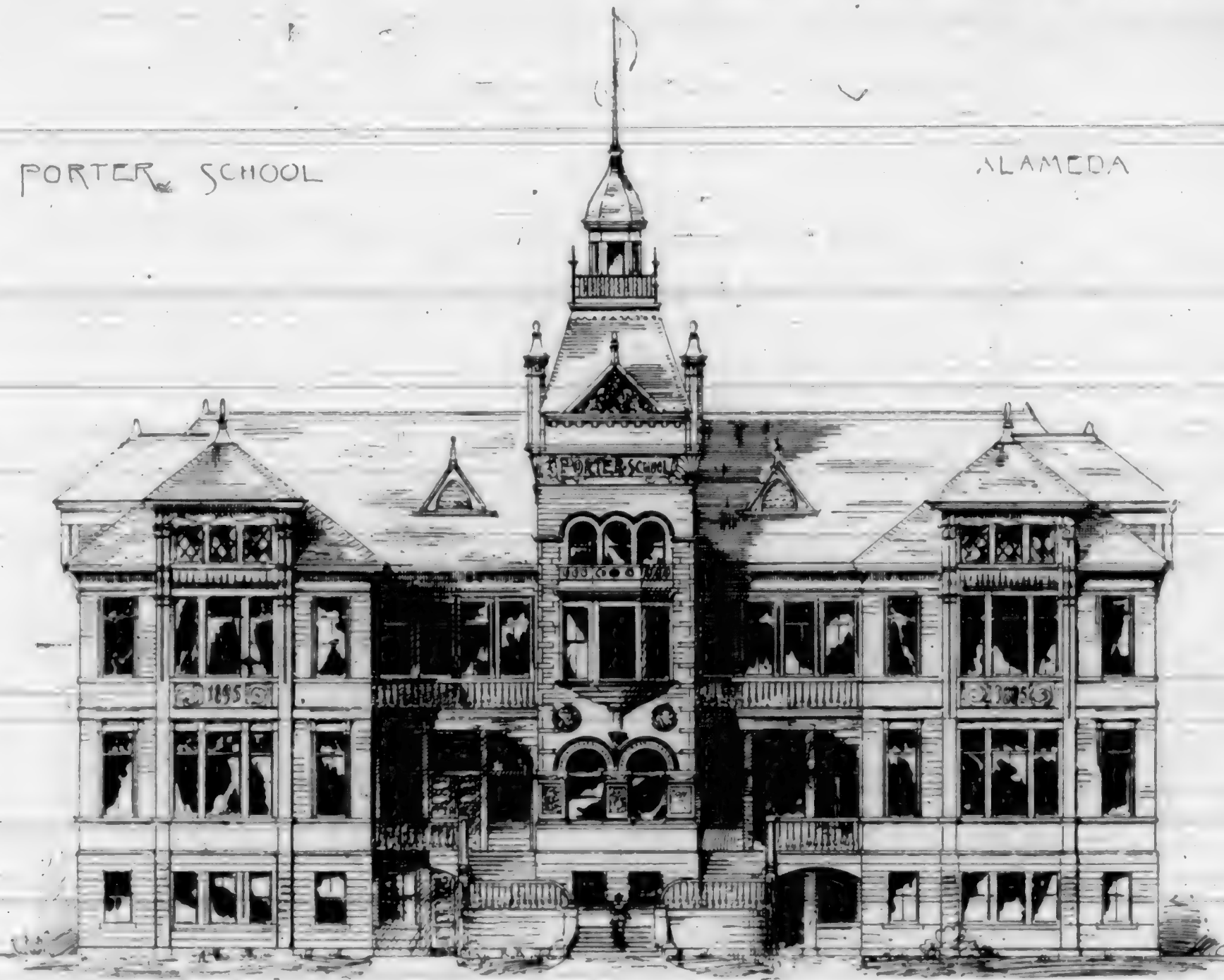
Having determined the amount of air required in any given case, the following important practical points remain to be determined:—

1. The circulation of the fresh air.
2. The area of fresh-air inlets.
3. The area of foul-air outlets.
4. The location of foul air outlets.
5. The construction and location of foul-air ducts.
6. The location, sectional area, and height of ventilating shafts.
7. The question of artificially assisting the draft by means of a pressure or suction fan, or by means of heat in the ventilating shaft.

We will consider each of these several questions in the order named.

height, from which it may escape readily. If the escape of air from the room is assisted by means of an efficient ventilating shaft, the velocity of the incoming air may be safely computed as ten feet per second. If the fresh air enters the room at a temperature so high as 120° F. to 150° F., the velocity of the air-current will be increased to 12 or 15 feet per second. Better practical results are obtained by large volumes of moderately heated air, traveling at a moderate speed, than from super-heated air traveling at a high velocity.

Calculating the velocity of the incoming air at ten feet per second, it is only necessary to divide the total amount of air required per second by ten, and the result will represent the area of free opening required. An allowance of at least forty per cent must be made when the openings are covered by register-plates. For example: Suppose the amount of air-needed is 240,000 cubic feet per hour, sufficient to sup-



ADDITION TO PORTER SCHOOL, LAVER & MULLANY AND W. J. CUTHBERTSON, ARCHITECTS.

1. A room cannot be properly ventilated without an efficient arrangement for the circulation of air. For this there must be for each space to be ventilated at least two openings: one for the admission of fresh air, the other for the removal of impure air. Nothing could be more absurd than the frequently witnessed attempt to ventilate a room by supplying it with a ventilating shaft connected with proper ducts and foul-air openings, but without any provision for a supply of fresh air. Such an arrangement is eminently well calculated to produce dangerous drafts through the opening of windows, and the impression that any attempt at efficient ventilation is liable to result in failure. It is also essential for the proper distribution of the air admitted to a room that the air shall be heated before it enters room or building, or at the moment of entering.

2. To determine the required area of fresh-air inlets, the amount of air required and the velocity at which the air is to travel must be known. Air heated to a temperature of 40° F. above that of the external air will travel at the rate of about five feet a second when entering a room of ordinary

ply 100 persons with the minimum quantity of air. This requires 6623 cubic feet of air per second. Sixty-six and two-thirds divided by 10 is 6.623. Adding 40 per cent for obstruction of register-plate, give us 9.3 square feet as the combined areas of the register-covered openings for admitting fresh air.

3. The number and location of the fresh-air inlets is not a matter of so great importance as is commonly supposed. If the fresh air enters the room at a temperature 20 to 40 degrees higher than that of the air of the room, it will go at once to the ceiling, no matter where or how admitted, and will thence gradually diffuse itself through the room, its course being chiefly determined by the location of the windows and of the foul-air exit openings. I think it preferable that the fresh-air inlet should be in the wall, near the floor, rather than in the floor, as it is by this means better protected against the accumulation of dust and dirt.

In the case of large buildings containing several floors and many rooms or apartments to be supplied with air, it is best not to undertake to carry a separate fresh-air duct to

each room, but to equalize the air pressure within the building by leading large ducts to the common hall or corridor of each floor, supplying each room of each floor through open transoms or register plates placed near the ceiling. This arrangement secures a constant supply of pure air in the halls or corridors from which each room can draw, and establishes a constant current in the direction of individual users of the air, the foul air being directly removed from each separate room by its own duct. This plan secures the greatest possible safety from the dissemination of contagion or the dispersal of any element capable of producing dangerous contamination of the air.

4. Experience has shown that in order to prevent unpleasant draft, the velocity of the air at outlet openings should not be greater than five feet per second. The necessary area of outlet openings is readily obtained then, by simply dividing the total amount of air to be supplied per second by five. For

EXPOSITION OF INDUSTRIES AND FINE ARTS OF MEXICO, 1896.

THE Federal Government has obligated itself to admit free of duty all materials and machinery for any buildings to be erected on the Exposition grounds, or the entire buildings imported for erection there, and, furthermore, it is expected that all building material used in construction of exhibition buildings and buildings entire for exhibition will be carried by the Railroad at one-half the regular tariff on same.

To this very important fact we desire to call the attention of Builders and Dealers and Manufacturers of Lumber, Machinery, Hardware, Glassware, Metal Roofing and Building Material.

It can readily be seen that there is open to our merchants a large and profitable field for their manufactures, taking in



example, suppose a room to be ventilated is calculated to accommodate thirty persons, each to be supplied with 2400 cubic feet of air per hour. The aggregate amount of air to be supplied will be 30x2400 or 72,000 cubic feet. Dividing this amount by 3600, the number of seconds in an hour, we have 20 cubic feet as the amount required for each second. Dividing this by 5, the velocity allowable, we have 4, which represents the necessary area for the foul-air outlets in square feet.

It must of course be understood that the figures thus obtained represent actual opening, and not an opening partially obstructed by a grate or register. As before stated, forty per cent must be allowed for when the opening is covered by an ordinary register.

As regards the proportion of the area of the foul-air exits to the area of fresh-air inlets, it may be said that outlets should be at least double the area of the inlets, since a velocity of ten or fifteen feet per second may be allowed without injury or inconvenience at the inlet, although such a velocity would not be tolerable at outlet openings.

TO BE CONTINUED.

consideration the fact that at present there is in Mexico a great dearth of building material, the prices of which, under the tariff, were high. The exposition grounds will embrace an area of about 600 acres, and there will be ample space provided for the construction of all varieties of buildings of a desirable nature aside from the official buildings of the National and Foreign departments and buildings used by concessionaires, and at the close of the Exposition the material used in the construction of these buildings will find ready and quick sale to Railroads, Haciendas, Merchants, etc. It is projected that a large hotel on the American plan shall be erected on the grounds for the accommodation of such visitors as prefer the comforts of American civilization, and it is understood that this hotel will remain permanent, it being located in the suburbs, in close proximity to the city.

The Exposition will undoubtedly create a large demand for portable buildings, such as cabins, kiosks, stations, ticket offices, etc., which could be easily transported and readily sold at the close of the Exposition.

As contracts will be made for the erection of all of the main buildings of the Exposition as well as the buildings

for concessionaires and others connected with the Exposition, a great and legitimate profit could be realized by the formation of a stock company which could handle all of these contracts, and parties desiring to subscribe to the company could in lieu of cash furnish merchandise and material.

The advantage derived from the liberal privileges granted by the Mexican Government to our merchants on the occasion of this Exposition are such as should be eagerly sought for by those who have the interests of the advancement of American commerce at heart.

In the interest of the exhibitors of the United States a company has been formed at San Francisco, Cal., under the style of the American-Mexican Exposition Company, A. K. Coney, Consul General at San Francisco, President, of whom any further information regarding the Exposition can be obtained.

BOOKS AND PERIODICALS.

LIPPINCOTT'S MONTHLY MAGAZINE for March, contains one of Captain Charles King's delightful stories called "A Tame Surrender" for the complete novel. Among other interesting articles "A Glimpse of Cuba" will be found timely from the fact at the present time Cuba is undergoing one of her usual revolutions, or perhaps it would be more proper to write attempted revolutions.

INDUSTRY, a monthly magazine comes to hand for March containing a number of articles not only of general interest, but particularly so for the resident of this coast. "Constructive Engineering on the Pacific Coast," as well as "Ship Building" will be read with pride as showing the advance that is being made in the science of Engineering and Mechanical Arts on this Coast.

THE GOULD'S MANUFACTURING CO.—This company have just issued a handsome illustrated catalogue and price list of pumps and hydraulic machinery for every service. The headquarters of this establishment is at Seneca Falls, New York, with warerooms 16 Murray street, New York City. Having been founded in 1848, it is fair to suppose that their pumps and other machinery must be of great value to account for the large increase of their works, Woodin & Little, 312-314 Market street, San Francisco, is one of their principal branch agencies.

A number of tables giving capacity of round tanks and cisterns, dimensions, weight, etc., of wrought iron welded pipe horse power shafting will transmit; weights and measures, estimate of values of foreign coins, and many others will add greatly to the value of this catalogue as a book of reference.

LEGAL DECISIONS.

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

SUFFICIENCY OF STATEMENT OF MECHANIC'S LIEN.—A mechanic's lien stating that the labor was done and material furnished in improving the separate real estate of a married woman is sufficient to charge the property.

Reece v. Haymaker, Supreme Court Penn., 50 At Rep. 404.

CONTRACT WITH OWNER NECESSARY IN LIEN FOR MATERIALS.—A person claiming a right to a lien for labor or material furnished in the construction of a building must show that it was performed or furnished at the instance of the owner or his agent.

Sellwood Lumber & Mfg. Co. v. Monell, Supreme Court Oregon, 38 Pac. Rep. 66.

STATUTE FOR MECHANIC'S LIENS LIBERALLY CONSTRUED.—The statute by which a mechanic's lien is created was designed to protect material men, contractors and laborers; and, although in derogation of the common law, its provisions should be liberally construed, to the end that the intention of the legislature may be realized, and substantial justice done to all affected by its provisions.

Hill v. Alliance Bldg. Co., Supreme Court S. D. 60 N. W. 752.

LIABILITY FOR INJURIES TO ADJOINING OWNER.—One who erects a chimney on his land is liable for injuries to an adjoining owner by its fall, when it is not the result of inevitable accident, or wrongful acts of third persons.

Cork v. Blossom, Sup. Jud. Court of Mass., 38 N. E. Rep. 495.

DEFECT IN DESCRIPTION OF PROPERTY CURED BY EVIDENCE.—Where, in a building contract, on which a mechanic's lien is claimed the only description of the property was embodied in the statement that it was "to be erected on Avenue E, just north of U. S. Post Office building, in the city of San Antonio, Tex.," the defect, if any, in such description, is latent, and may be aided by extraneous evidence.

The order of the introduction of evidence is within the discretion of the court.

Myers v. Maverick, Ct. Civ. App. Tex., 27 S. W. Rep. 1083.

WHEN TAKING NOTE DOES NOT WAIVE MECHANIC'S LIEN.—In the absence of an agreement or anything indicating an intention to the contrary, a mechanic or material man does not waive his right to file and enforce a lien merely by accepting for the amount of his claim the promissory note of the owner, at his request, and for the sole purpose of suspending his right to foreclose such lien for sixty days, at which time such note, according to its terms, matures.

Neither will the mere assignment of such note operate as a waiver or extinguish the lien, nor prevent the assignee from obtaining a decree of foreclosure, provided he has the note, and offers to surrender it at the trial for cancellation.

Hill v. Alliance Bldg. Co., Supreme Court S. D., Co. N. W. Rep. 752.

RIGHTS OF ASSIGNEE OF CONTRACT.—Where a vendor has made advances to the purchaser to enable him to erect a building on the land under an agreement that he should be secured by a lien, specific performance in favor of the assignee of the purchaser will be decreed, subject to the vendor's judgment for the money so advanced.

The assignee of an oral contract for the purchase of land, which has been partly performed, has the same right to specific performance as the assignor.

Dodge v. Miller, Supreme Court, 5th Dpt., 30 N. Y. S. 726.

EFFECT OF FAILURE TO AFFIX NOTARY'S SEAL TO CLAIM FOR LIEN.—The omission of a notary to affix his seal to the jurat in a notice of claim for a lien cannot be cured, at a trial of an action to foreclose the lien, by the introduction of parol evidence that the claim was in fact sworn to; and where the seal is affixed, and the name of the notary is omitted, parol evidence to the effect that the claim was in fact sworn to is equally incompetent; and the omission in each case renders both claims for a lien insufficient, when filed, to constitute constructive notice of the existence of such liens.

Such failures do not defeat the lien, but operate to postpone it to purchasers or incumbrances in good faith, without notice, whose rights accrued after the time within which the verified statement should have been filed. They are not available to one with actual notice of the existence of such lien, takes a quit-claim deed to the property, subject to all valid liens, under circumstances that fail as a matter of law to make him a purchaser in good faith.

Hill v. Alliance Bldg. Co., Supreme Court S. D., 60 N. W. 752.

BUSINESS MOSAICS.

When a man decides upon improving his shop, factory or farm, by the addition of power, he naturally looks for something entirely up to date. He investigates, considers, and finally decides to buy an Ajax Coal Oil Gas Engine as meeting his requirements more fully, and being safer, than any other power obtainable. Palmer & Rey, San Francisco, Cal., the manufacturers of this engine, have earned the gratitude of the public by placing within its reach a reliable, economical power, that defies the restrictions of insurance companies. It is the latest and best.

"It's the horse Oi don't bet on that always wins at the races," said Mr. Dolan. "An' somehow Oi never can remember to put me money on him an' let th' others alone."—*Washington Star.*

The attention of architects and those contemplating building is called to the advertisement of "The J. L. Mott Iron Works" on page v of this issue. The high prices that had to be paid heretofore for the class of goods there shown has deterred many architects from specifying and owners from using same, but now this firm has made arrangements, by which these goods can be furnished at practically the same prices as first-class enameled iron goods. The merits of the solid porcelain goods are so well known that no comment is necessary. Their San Francisco agent M. S. James at room 35 Flood Building will give all information that may be wanted on this subject.

"Haven't you got this book in a chicken salad binding?" asked the Cheerful Idiot. "What do you mean?" asked the astonished bookseller. "Half calf."—*Indianapolis Journal.*

Merchant & Co. give a number of good reasons why their brands of tin should be used: First because you obtain the finest quality of Martin-Siemen's open hearth steel; second, because you get a uniform standard of coating all over the plate; third, because the coating is put on by a Palm Oil process and not by acid flux generally used on account of its cheapness. Therefore be careful to specify the world's best "Merchant's Old Method," "Merchant's Roofing," and "Alaska." The strength of a chain depends on its weakest link, the life and value of a roofing plate depends on its thinnest bit of coating. The value of Merchant's roofing tin is in the process and uniformity of coating, and the entire absence of acid flux.

"Can I write my name under the received payment of this bill?" asked the bill collector who likes to put things as delicately as possible. "No, thank you," replied Mr. Brokely, "I'm no autograph fiend."—*Washington Star.*

The New and Improved Chapman Fire Hose Reel is the latest improvement and may be considered a very efficient and reliable apparatus, the manufacturer makes the claim that it is the best in the world. See their advertisement on page xii of this journal. R. S. Chapment, late Fire Surveyor for Board of Underwriters, 14 and 16 Fremont street, will give you further information, and a guarantee that what he sells is as represented.

George Goodman may be considered a benefactor of that portion of mankind that live in San Francisco, a man that makes the rough ways smooth can certainly be considered a benefactor; Artificial stone in all its branches with sidewalks and garden walk a specialty is what Mr. Goodman finds to fully occupy his time. 307 Montgomery street, Nevada Block, San Francisco.

Mrs. Quizby—"Why didn't you sell your house after you advertised it?" Mrs. Brown—"When we saw the description that the real estate agent gave of it, we thought it would be a paradise lost if we did."—*Philadelphia Inquirer.*

Phoenix Pure Paint is guaranteed absolutely pure and satisfactory on the building or we will replace it with any material the architect may select "This is what the manufacturers say of this article and when W. P. Fuller & Co. say a thing they mean what they say."

While you are discussing the paint question with this firm, it is a good time to inform yourself about "Duresco" their new wall finish or washable water color, if you are not already posted on that question.

Thar is the place whar the Major fell through the ice." "How do you know?" "Easy enough. Just look at that cork floatin' yander."—*Atlanta Constitution.*

Samson Spot Cord is a cord that speaks for itself, as you can see at a glance that no other cord is substituted; warranted free from waste and imperfections. Send for samples to Samson Cordage Works, Boston, Mass., and you will be satisfied to use no other.

"When does this cough trouble your wife most?" Husband—"When she has her ear to the keyhole trying to hear what the new boarders are saying."—*Chicago Inter-Ocean.*

If you are in want of electric fixtures, and do not know where to find them, go to Thomas Day & Co., 222 Sutter street, where anything in the way of gas and electric fixtures are sure to be of the best quality in the market.

Caller—"We are very rich and wish to marry our daughter to a count, a marquis, or a duke. Clerk (with dignity)—You are in the wrong office. This is a matrimonial agency. You will find the International Purchasing Agency two doors to the left."—*Ex.*

Joshua Hendy Machine Works is the place to go for light and heavy castings. They are dealers in all kinds of machinery of their own manufacture, this company was incorporated Sept. 1882 having been engaged for years in furnishing engines and pumps for buildings and in fact machinery of all kinds for almost every conceivable purpose. 39 to 51 Fremont street are their headquarters, with foundry and warehouse at Kearny, Bay and Francisco streets.

CITY BUILDING NEWS.

- Army** near Valencia. To build; owner, A. Chamberlin; contractor, F. V. Acker; signed, Feb. 21; filed, Feb. 23; cost \$1000.
- Berry** near 5th. Brick warehouse; owners, Somers & Co.; contractor, W. P. Smith; cost \$8000.
- Bush** near Buchanan. Alterations and additions; owner, Patrick and Mrs. A. Walsh; contractor, John L. McLaughlin; signed, Feb. 15; filed, Feb. 18; cost \$1120.
- Bush** near Laguna. To build; owner, Henrietta Ann Forbes; architect, R. H. White; contractor, John G. Adams; signed, Feb. 16; filed, Feb. 18; cost \$6000.
- Brannan** near 5th. Two-story stable; owners, McNab & Smith; architect, Emil John; contractor, Geo. H. Walker; signed, Feb. 18; filed, Feb. 19; cost \$8740.
- Brannan** near 5th. Rough carpenter work; owner, D. Nugent; architect, J. J. Clark; contractor, Cameron & McDonald; signed, March 6; filed, March 6; cost \$6870.
- Brannan** near 5th. Brick for church; owner, D. Nugent; architect, J. J. Clark; contractor, San Joaquin Brick Co.; signed, March 7; filed, March 7; cost \$737 1/2 per thousand.
- Birch Ave.** near Buchanan. All work on a building; owner, Mrs. T. N. Van Ness; architects, Wright & Sanders; contractors, Liebert & Hoffmann; signed, Jan. 3; filed, Feb. 20; cost \$2200.
- Bush** near Laguna. Plumbing; owner, Henrietta A. Forbes; architect, R. H. White; contractor, G. C. Sweeney; cost \$980.
- Broadway** near Stockton. To build; owner, V. Pucinelli; architect, E. Depierre; contractor, P. A. Antonelli; signed, March 9; filed, March 9; cost \$9,000.
- California** and Jones. Brick and stone building; owner, Nob Hill Development Co.; architects, Buzicek & Gash; contractor, D. Jordan; signed, March 4; filed, March 11; cost \$26,000.
- California** near Baker. Alterations and additions; owner, Margaret Skane; architect, J. P. Brady; contractor, James O'Sullivan; signed, Feb. 20; filed, Feb. 25; cost \$2165.
- California Ave.** near 30th. To build; owner, Nils Linberg; contractor, J. Gilligley; cost \$1475.
- California** near Polk. Additions and alterations; owner, Samuel Moffatt; architect, H. W. Little; contractor, Geo. R. Lang; signed, Feb. 27; filed, Feb. 27; cost \$2525.
- Castro** near 18th. To build; owner, Mrs. Mary Kipp; architect, John T. Kidd; contractor, C. W. Doherty; signed, March 1; filed, March 2; cost \$3,600.
- Capp** near 16th. To build; owner and builder, G. Ratto; cost \$6000.
- Church and Liberty.** To build; owner, Mrs. Mary E. Crawford; architect, W. H. Wharf; contractor, Jacob Schuler; signed, March 2; filed, March 8; cost \$3225.
- Creek Lane** (Eric street) near Folsom. To build; owner, Albert A. Miller; contractor, H. R. Schmuckert; signed, March 9; filed, March 9; cost \$2640.
- Cora** near Visitation Ave. To build; owner, Mrs. C. Bergold; architect, Geo. Strohmeyer; contractor, H. A. Tessmer; signed, Feb. 7; filed, Feb. 15; cost \$1150.
- Cole** near Waller. Six two-story frame residences; owner, William Hinkel; architect, Wm. Keene; days work; cost \$21,000.
- Corbett Ave.** near Hattie. To build; owner and builder, A. Murry; cost \$2000.
- Davis** and Washington. Carpenter work on brick building; owner, Estate of J. Ivanovich; architects, Pissis & Moore; contractor, J. W. Wissinger; signed, Feb. 11; filed, Feb. 28; cost \$8075.
- Davis** near Washington. Carpenter work, etc., on brick; owner, Issie Kohn; architects, Pissis & Moore; contractor, J. W. Wissinger; signed, Feb. 11; filed, Feb. 28; cost \$590.
- Douglass** near 17th. Additions; owner, Cal. Brewery Co.; contractor, A. Huller; cost \$5000.
- Diamond** and 25th. Two one-story frame cottages; owner and builder, T. A. Born; cost \$6000.
- Diamond** near 25th. Two-story frame dwelling; owner and building, T. A. Born; cost \$3700.
- Eighth Ave.** near California. To build; owner, Mrs. Z. Hawkes; contractor, A. W. Goss; signed, Feb. 13; filed, Feb. 14; cost \$1900.
- Elizabeth** near Hoffman. To build; owner and builder, J. Anderson; cost \$2000.
- Fell** and Masonic Ave. To build; owner, Charles H. Phillips; contractors, White Bros.; cost \$6000.
- Fell** and Masonic Ave. Additions and alterations; owner, Charles H. Phillips; cost \$1000.
- Folsom** near 7th. Alterations and additions; owner, Harris Samuel; architects, Saffeld & Kohlberg; contractors, Peterson & Person; signed, Feb. 20; filed, Feb. 21; cost \$1651.
- Fifth Ave.** near Clement. To build; owner, Ernest Webner; architect, A. J. Barnett; contractor, Ed. Mooney; signed, Feb. 27; filed, March 1; cost \$1300.
- Franklin** and California. Concrete and cement work; owner, Edward Coleman; architect, W. H. Little; contractor, Geo. Goodman; signed, Feb. 28; filed, March 2; cost \$2375.
- Franklin** and California. Plumbing; owner, Edward Coleman; architect, W. H. Little; contractor, H. Williamson; signed, March 5; filed, March 6; cost \$962.50.
- Geary** near Leavenworth. Excavations, etc.; owner, Percy Klien; architect, Emil Depierre; contractor, James A. Wilson; signed, Feb. 27; filed, Feb. 28; cost \$1700.
- Golden Gate Ave.** near Laguna. Additions; owner, Mrs. Annie Fulton; architects, Martens & Coffey; contractors, Ackerson & Peterson; signed, Feb. 23; filed, March 4; cost \$2180.
- Hyde** near Broadway. To build; owner, Cornelius Harrigan; architect, J. C. Colbourn; contractor, F. W. Maurice; signed, Feb. 5; filed, Feb. 13; cost \$5300.
- Hyde** near Clay. Plumbing work; owner, Laura Hirschfeld; architects, Pissis & Moore; contractor, R. Rice; signed, Feb. 23; filed, Feb. 23; cost \$1048.
- Jackson** near Locust Ave. Two-story brick; owner, Belle F. Lee; architect, Newton J. Tharp; contractors, Ingerson & Gore; signed, Feb. 12; filed, Feb. 15; cost \$2652.
- Jackson** near Steiner. To build; John Spruance; architect, J. H. Littlefield; contractors, Blanchard & Clark; signed, Feb. 15; filed, Feb. 18; cost \$3345.
- Kentucky** near Sierra. To build; owner, Hans Kroeger; architect, H. Gellfuss; contractor, F. Klatt; signed, Feb. 28; filed, Feb. 28; cost \$4402.
- Kingston Ave.** and Mission St. To build; owner, John Wieser; architects, Martens & Coffey; contractor, F. Weinert; signed, March 1; filed, March 1; cost \$4083.
- Laguna** near Vallejo. Concrete foundations; owner, Caroline S. Townsend; architect, W. H. Wharf; contractor, Chas. Quast; signed, March 4; filed, March 4; cost \$1620.
- Laguna** and Jackson. Hydraulic Ram Elevator; owner, W. F. Whittier; architect, E. R. Swain; contractors, Cahill & Hall Elevator Co.; signed, March 1; filed, March 6; cost \$1225.
- Lott** near Grove. To build; owner, Richard English; architects, Martens & Coffey; contractor, I. J. Walsh; signed, Feb. 20; filed, March 6; cost \$2388.
- McAllister** near Devisadero. To build; owner and builder, H. Keenan; cost \$300.
- Mission** and 24th. Repairs and additions; owner, Thuseelda E. Ingram; architect, T. W. McKee; contractor, Ed. Boyer; signed, Feb. 18; filed, Feb. 19; cost \$2100.
- Mission** near Main. Four-story brick; owner, Eliza T. Grosh; architect, William Patton; contractor, W. A. Butler; signed, March 7; filed, March 8; cost \$32,500.
- Octavia** near Greenwich. Cottage; owner, Mr. Tracy; contractor, J. W. Smith; cost \$2000.
- Octavia** near Greenwich. To build; owner, W. C. Latham; architect, H. T. Bestor; contractor, Christian Anderson; signed, March 9; filed, March 11; cost \$1400.
- Pacific Ave.** near Octavia. Carpenter, masonry, plumbing, etc.; owner, Mrs. Elizabeth Dore; architect, Samuel Newson; contractor, Richard Sinnott; signed, Feb. 12; filed, Feb. 16; cost \$7375.
- Presidio** Reservation. Excavations, etc., for boiler house; owner, U. S. Government; architects, Percy & Hamilton; contractor, W. H. Flaherty; signed, Feb. 19; filed, Feb. 21; cost \$7000.
- Presidio** Reservation. Fort Point 1st brick dynamite building; owner, U. S. Government; architects, Percy & Hamilton; contractor, D. T. Franconer; signed, Feb. 25; filed, Feb. 25; cost \$1400.
- Point Lobos Ave.** near 5th Ave. Macadamizing, etc.; owner, La Societe Francaise, etc.; architect, Emile D. pierre; contractors, Warren & Malley; signed, Feb. 13; filed, Feb. 14; cost \$2100.
- Polk** and Elm. Cottage; owner, R. H. Lyod; architect, B. E. Henriksen; contractors, Doyle & Son; signed, March 1; filed, March 2; cost \$3280.
- Polk** and Sutter. To build; owner, M. De Young; architect, Clinton Day; contractor, Robert Frost; signed, March 5; filed, March 6; cost \$31,500.
- Pierce** near Greenwich. Alterations and additions; owner, F. G. Elckhorst; architect, Emil John; contractor, Alfred Neville; signed, March 4; filed, March 8; cost \$1520.
- Second Ave.** near California St. Cottage; owners, Lee Kahn and wife; contractors, White Bros.; signed, March 4; filed, March 4; cost \$2388.
- Second Ave.** near Clement. To build; owner, H. Frohman; architect, H. Kretzer; contractor, B. J. Taylor; cost \$3500.
- Second Ave.** near Lake St. To build; owner, Thos. G. Parker; architect, H. J. Kretzer; contractor, Byron I. Taylor; signed, Feb. 15; filed, Feb. 15; cost \$2800.
- Steiner** near Haight. To build; owner, Mrs. E. Winters; contractor, Casper Zwierlein; signed, Feb. 12; filed, Feb. 15; cost \$2210.
- Spear** near Howard. One-story brick; owner, Janet C. Haight; architects, Herman & Swain; contractor, Daniel D. Cameron; signed, Feb. 16; filed, Feb. 18; cost \$2575.
- Spear** near Howard. Brick and mason work; owner, Janet C. Haight; architect, Herman & Swain; contractor, J. O'Sullivan; signed, Feb. 20; filed, Feb. 20; cost \$1848.
- Shotwell** near 15th. To build; owner, S. LeRoy; architect, F. Vanderveken; contractor, S. F. Building Co.; cost \$4500.
- Sixteenth** and Church. Three-story frame and brick building and two-story frame in rear; owner, Joseph Harvey; architects, Havens & Toepke; contractors, Ackerson & Paterson; signed, Feb. 28; filed, March 4; cost \$3100.
- Taylor** near Green. To build; owner, H. H. Christiansen; contractor, A. Waller; cost \$2500.
- Third Ave.** near Clement. Cottage; owner, Geo. Allen; contractor, H. Rowe; cost \$1800.
- Tenth Ave.** near Pt. Lobos. Cottage; owner, G. Schmeiser; contractor, G. T. Taft; cost \$1800.
- Tenth** near California. To build; owner, C. Stoltz; contractor, D. A. McIntosh; cost \$2000.
- Twenty-third** near Folsom. To build; owner, Jas. H. & L. A. Anderson; contractors, Hyde & Cox; signed, March 4; filed, March 6; cost \$1850.
- Twenty-fourth** and Sanchez. Cottage; owner, P. Gumm; contractor, R. Frost; signed, March 2; filed, March 2; cost \$1828.
- Thirtieth** near Laikley. To build; owner, Peter Braunbeck; contractor Robert Frost; signed, March 2; filed, March 7; cost \$1500.
- Washington** near Scott. To build; owner, Agnes J. Jones; architect, H. D. Mitchell; contractor, J. Norris; signed, March 2; filed, March 7; cost \$4614.
- Webster** near Pine. To build; owner, L. R. Ellert; architects, Shea & Shea; contractor, James Mooney; signed, Feb. 12; filed, Feb. 20; cost \$5400.

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

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NUMBER 4.

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

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

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

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

W. J. CUTHBERTSON, President. OLIVER EVERETT, Secretary.

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UR Eastern exchanges contain full descriptions of the Orchard street disaster and the attempts to place the responsibility therefor on the shoulders of the proper persons. The facts of the case are as follows: An interior cross wall of brick was to be carried by an iron girder,

resting on the side walls of the building. The bearing was not sufficiently strong to carry the weight, and gave way with fatal results. The plans for the building had been passed on and approved by the Department of Buildings of New York City, and theoretically would have been within the limits of safety. Owing to the poor quality of bricks used, no bonding, and poor mortar laid in freezing weather, the disaster occurred. The Coroner's jury blamed the deputy inspector who passed the plans as being grossly careless, but the Grand Jury absolved him from blame.

The real responsibility appears to belong to the person supervising the carrying out of the work, and the Grand Jury who reported on the matter recommended "that no building be erected hereafter, or changes made to an existing building, without the employment of a duly 'licensed'

architect who shall draw the necessary plans and specifications of the same and superintend the same from first to last during its progress" and also recommended that "no person be allowed to practice the profession of architecture, make plans and specifications for a building or superintend its erection unless duly licensed for that purpose and registered."

Public indifference and private greed and shortsightedness have so far hindered or entirely thwarted the efforts of the architectural profession to exclude by law, the incompetent and incapable practitioners, and it will take more than one fatal accident to interest the public in the important subject of safe building.

The law presented to our last California Legislature, designed to meet the requirements of the more complicated construction of advancing civilization, by restricting the right to practice architecture to those proving themselves competent, fared no better than the law proposed to the Legislature that preceded it, nevertheless the profession men, who see the necessity of some such law for the safety and protection of the public, will continue their crusades in this and other States, until they succeed in their meritorious

efforts to raise the proficiency of the architectural practitioner to such a standard that fatal accidents will no longer be caused by faulty construction and imperfect execution. This can only be done by prohibiting the grossly incompetent from practicing.

THE MANUFACTURING INTERESTS OF THE PACIFIC COAST.

A PAPER READ BEFORE THE MANUFACTURERS AND PRODUCERS CONVENTION, BY MR. OSCAR LEWIS.

Mr. President and Gentlemen of the Convention:—

To every man connected with the manufacturing interests of the Pacific Coast (and especially to those engaged in the Building Trades) the necessity of this Convention is but too plainly apparent; and the varied interests here represented show to us all that it is not only one industry that is threatened with disaster, if not annihilation, but that all are alike passing through the most disastrous business depression that has ever visited California. We all of course expect to take our share of these periodical upheavals in industrial and financial circles that sweep over our entire country, but we know, that aside from this, manufacturing has been on the down grade for some years past, and each year sees a greater number of firms, either going out of business altogether, or becoming importers in part at least, of the various articles in which they deal.

"It is a condition, not a theory that confronts us." We cannot disguise it. The time has arrived, when not only the employer, but employe, the mechanic, the farmer, the merchant and the real estate owner, in fact all who have a hope in what California ought to be, must stand together, and putting aside our petty differences, work in harmony for the maintaining and building up of the various industries of this Coast.

In connection with the Building Trades let me give you some examples of selfishness, or short-sightedness, of some of our real estate owners and contractors—and I may truthfully say that a good many of them brought little more when they came to this State, than they did when they came into the world. But before doing so, I will say that our local architects, builders and workmen will compare favorably with any that can, or have been, imported from any part of these United States. We fall short only in the art of combining modern conveniences with modern ugliness, and some of us are bold enough even to attempt that; but at all events there is no reason why San Francisco mechanics should not build San Francisco's buildings.

Yet the iron stair cases and ornamental iron work, costing in the neighborhood of \$80,000, of one of our large buildings on Montgomery street, was made by Winslow Bros., of Chicago. It was not even bid on here, as in the opinion of the Chicago architects of that building, it could not be done here. I do not think it could have been done here as poorly. It was condemned and would have been rejected, but for the delay such rejection would have caused. This fact, and that great boon to botch workmanship—lead and putty—pulled it through.

The carpenter, or mill work, the entire wood finish was also made in Chicago, shipped out here and nailed in position by a local contractor; and at this time over one-half of the wood-working, machinery and mill hands of San Francisco were idle, and hundreds of worthy men were standing in

line for hours in the rain to obtain a card that would entitle them to work in the Park for a dollar a day.

Why only recently, in the midst of our excitement over the laudable "Valley" Railroad enterprise, we found time to send a small job of iron work to Winslow Bros. of Chicago, while iron-workers walked the streets of San Francisco idle. This reminds me of Artemus Ward, who was in favor of enlisting and sacrificing all his wife's relatives, including his mother-in-law to put down the Rebellion.

And yet, Mr. President and Gentlemen of the Convention, we are all more or less to blame in this matter, for it seems to be a California fashion to shout for the opposition and travel on the old line. Even at this moment, when all Californians seem to be banding together in their effort to build up the industries of the State and City, the Eastern drummer—or human toredo—is at work, boring around the architects' offices with his samples of interior wood finish, seeking to lay his plans to procure wood work that will soon be required for our large business buildings and residences that are now in course of construction.

Owners and Contractors of the Coast, give the mechanics of California a chance: If you want the Eastern woods that are not grown here, import the lumber and have the work done here, unless the Railroad treats you as it does the wire nail industry—charge sixty cents a hundred on wire rods or the raw material, and thirty cents on the finished article.

Gentlemen, it does seem to me that those of us who have invested large amounts of money in rolling-mills, ship-building works, wire works, foundries and wood-working plants, have made a mistake, when the great iron and steel manufacturer of Pennsylvania, can be fully represented and equipped on this Coast, by a very affable gentlemen, occupying a 7x9 office, containing a roller top desk and a telephone; and while thousands of extensive Eastern manufacturers and wholesale houses, are represented by nice young men with alligator skin grip-sacks, who adorn themselves with diamond pins, four-in-hand ties, Willie-boy coats and custard pie shoes, while the people of San Francisco sigh for a "Half-Million Club," so do I sigh for a half million clubs.

But enough of complaint: Admit it all, and what is the remedy? Boycott Eastern made goods? No! rather build up our own State and let others build up theirs.

It has been said that the high rate of wages prevents manufacturing. While it is true that wages here are higher than in the East, we hope that the rates in the East may be raised rather than ours lowered. However, notwithstanding the fact that both labor and materials are higher here, our greatest difficulty is local prejudice, and the limited market we have to supply: For we know that the cost of manufacturing is largely governed by the quantity of a given article manufactured.

It is to be hoped that this Convention will go far towards convincing the people of this Coast, without regard to age, color, or previous condition, that their true interest lies in standing loyally together, and so far as possibly supplying their wants from the home market. Use the California produced article, even if it costs a little more, for the extra cost will come back to you tenfold in the general prosperity of the State.

A competing railroad has been advocated. There would be some merit in that, for to us manufacturers it would be no lingering death, and we could rent our plants as store-houses for the reception of its cheap freight and Eastern made goods that would flood San Francisco.

After thirty-six years residence in California, I believe in

her resources; I have faith in her people, and I feel that with the commencement of the Valley Road, and the general awakening of the people, the revival of our mining, agricultural and industrial interests, a new era of prosperity will be felt over our entire State and Coast: If on the other hand, the people will not awake, will not protect their own interests from the tomahawk of the middle-man, or the grasping greed of our soulless monopolies, then at least save us from the hands of the Health Officer, and give us an elegant funeral, as will, in the language of Jimmie McGinn, make it a pleasure for us to die; dig the grave wide, dig it deep, and place it face downwards so that we may gaze on Chicago.

CODE OF ETHICS,

IN CONFORMITY WITH THE BEST STANDARDS OF PRACTICE, RECOMMENDED TO ITS MEMBERS BY THE BOSTON SOCIETY OF ARCHITECTS.

Adopted by the Society, February 1, 1885.

SECTION 1. No member should enter into partnership, in any form or degree, with any builder, contractor, or manufacturer.

SEC. 2. A member having any ownership in any building material, device, or invention, proposed to be used on work for which he is architect, should inform his employer of the fact of such ownership.

SEC. 3. No member should be a party to a building contract except as "owner."

SEC. 4. No member should guarantee an estimate or contract by personal bond.

SEC. 5. It is unprofessional to offer drawings or other services on approval and without adequate pecuniary compensation.

SEC. 6. It is unprofessional to advertise in any other way than by a notice giving name, address, profession, and office hours, and special branch (if such) of practice.

SEC. 7. It is unprofessional to make alterations of a building designed by another architect, within ten years of its completion, without ascertaining that the owner refuses to employ the original designer, or, in event of the property having changed hands, without due notice to the said designer.

SEC. 8. It is unprofessional to attempt to supplant an architect after definite steps have been taken toward his employment.

SEC. 9. It is unprofessional for a member to criticize in the public prints the professional conduct or work of another architect except over his own name or under the authority of a professional journal.

SEC. 10. It is unprofessional to furnish designs in competition for private work or for public work, unless for proper compensation, and unless a competent professional adviser is employed to draw up the "conditions" and assist in the award.

SEC. 11. No member should submit drawings except as an original contributor in any duly instituted competition, or to secure any work for which such a competition remains undecided.

SEC. 12. The A. I. A. "schedule of charges" represents minimum rates for full, faithful, and competent service. It is the duty of every architect to charge higher rates whenever the demand for his services will justify the increase,

rather than to accept work to which he cannot give proper personal attention.

SEC. 13. No member shall compete in amount of commission or offer to work for less than another, in order to secure the work.

SEC. 14. It is unprofessional to enter into competition with or to consult with an architect who has been dishonorably expelled from the "Institute" or "Society."

SEC. 15. The assumption of the title of "Architect" should be held to mean that the bearer has the professional knowledge and natural ability needed for the proper invention, illustration, and supervision of all building operations which he may undertake.

SEC. 16. A member should so conduct his practice as to forward the cause of professional education and render all possible help to juniors, draughtsmen, and students.

ARMY OFFICERS AS SUPERINTENDANTS OF PUBLIC BUILDINGS.

THE old scheme, of having officers of the United States Army superintend the construction of public buildings, has been revived, according to the Washington papers; and the usual frightful examples of the slowness of progress on such buildings, under the ordinary methods, are brought up to show how much more quickly they would be finished if the military arm took hold of them. To complete the alluring picture, we are told that the Congressional Library, which is nearing completion, under military direction, and has certainly been rapidly built, is "a gem of art," as if all we had to do, to scatter gems of art speedily around the country, was to transfer the Supervising Architect's office to the Army Headquarters. It is hardly necessary to say that this agitation is decidedly pernicious. That the Congressional Library is a fine building, well and quickly built, we acknowledge with pleasure, but, notwithstanding the remarkable and exceptional qualifications of General Casey and Colonel Green for architectural undertakings, it is quite capable of improvement as a work of art, and the rapidity with which it has been carried out is due as much to the energy with which the officers cut off Congressional interference, and demanded appropriations, as to any hidden capacity of the military mind for making bricks and stones jump into their places without assistance; while the Pension Building, the other great example of military architecture, though quickly built, for the same reasons, is about as far from being a "gem of art" as any structure within our knowledge. The fact is that the people who can build most rapidly, skilfully and beautifully are the people who have devoted their lives to learning how to do so, namely, the architects; and the sooner the public stops dodging around them, and trying to utilize politicians and generals and carpenters and what not, in place of them, the better off it will be.—*The American Architect and Building News.*

PRACTICAL SUGGESTIONS RESPECTING THE VENTILATION OF BUILDINGS.

Continued from March Number.

FIVE. When a room is heated wholly or chiefly by warm air, the distribution of heat in the room will be almost wholly controlled by the location of the foul-air outlets. The natural course of the air current is this: the heated air

risers to the ceiling, spreads out, and coming in contact with the outer walls which are lower in temperature than the inside walls, especially the windows, it is cooled and falls to the floor. It is evident then that as the outer walls and the proportions of the room adjacent to them are necessarily the coldest part of the room, the circulation of the air through the room and the proper distribution of the heat will be facilitated by placing the foul-air openings along the outer walls and preferably under the windows. If the foul-air outlets are placed in an inner wall or at the floor near an inside wall, one effect will be to draw toward this opening warm air which ought to have been utilized in warming the outer walls. Another effect, and one of the most disagreeable features attending this method of placing the foul-air outlets, is that the air which has been cooled by contact with the windows and outer walls and by its greater specific gravity has fallen to the floor, will be drawn the whole distance across the floor to the opening on the opposite side, thus constantly maintaining at the floor a stratum of cold air. An arrangement of this sort is a very frequent cause of cold floors, and consequently cold feet, and the resulting headaches from which the occupants of such a room are almost sure to suffer.

The foul-air outlets should be placed as near the floor as possible. The opening may be in the base board or in the floor itself. The only objection to the latter method is the collection of dust which is likely to be swept into the opening.

6. The ventilating ducts communicating with the foul-air outlets should have a sectional area equal to the free area of the openings with which they communicate. This capacity should be maintained until the duct reaches the ventilating shaft, and should be increased if several turns are made in the duct as each square turn has the effect to diminish the velocity of the air current nearly one-half. Square turns should never be made, and the ducts should be enlarged at the angles where a turn is necessary. In case a duct must be carried for some distance, its capacity should be increased fifty or even one hundred per cent to compensate for the great amount of friction occasioned by distance. The ventilating ducts should of course be made tight. For this purpose it is necessary that they should be lined with metal or some other durable material. Even well-seasoned lumber will shrink and open up large cracks, by which the efficiency of the duct will be very materially diminished. It is also a wise plan to construct ventilating ducts of some non-combustible material, or at least to line with such material as a caution against fire.

Only ducts coming from the same room or floor should be connected with a common ventilating shaft. Each story must have its own foul-air shaft; otherwise the counter drafts occasioned by the opening of doors and windows, especially in moderate weather, or the adverse influence of winds, will be certain to lead to contamination of the air of one room by the air of another room with which it is in communication through the common shaft.

It is of the utmost importance to supply each floor, and if possible each room, with its own independent ventilating shaft running as directly as possible to the open air without any connection with other ducts.

7. The location, sectional area, and height of the ventilating shaft, are questions of very great interest and practical importance. As regards location, it is always better that the ventilating shaft should when possible be located within the building, as in an inside wall; this insures a temperature

equal to that within the building, and so secures a constant and positive draft, whenever the building is supplied with artificial heat. If, in addition, the ventilating shaft can be located adjacent to the chimney, or if the smoke can be carried up through it by means of a boiler iron stack or a stack constructed of sewer pipe, a still higher temperature of the air in the ventilating shaft and hence a better draft will be secured.

The sectional area of the shaft will depend upon the amount of air to be removed and the height of the shaft.

By a careful study of the tables of Parke and others, I have been able to construct a simple formula which is of great practical service in determining these two questions. The following is the formula: The square root of the height of a shaft, multiplied by the square root of the difference in temperature between the air in the shaft and the outside air, divided by four, equals the velocity of the air in the shaft in feet per second. In using this formula, it is of course necessary that two of the quantities should be known. The difference in temperature is a pretty constant factor. In fixing this the minimum difference should of course be chosen rather than the maximum, as a ventilating shaft which may have an ample capacity in extreme cold weather when the great difference between the external and internal air would secure a powerful draft, would be quite insufficient to supply the necessary amount of air in moderate weather. I have chosen as a basis for obtaining the minimum difference in temperature, the temperature of 45° F. for external, and 70° F., the usual internal temperature. As a temperature much higher than 45 degrees, doors and windows are likely to be opened, and hence the working of any ventilating apparatus would be interfered with. The difference between 45° and 70° is 25, which may be fairly taken as a basis for calculation.

The height of the ventilating shaft is usually determined by the architect, who considers it with reference to the architectural effect in the building. When this is given, we have but to take the square root of the known height of the chimney, multiplied by the square root of 25 which is 5, divide the product by 4 and you have as a result the velocity at which the air will travel in the shaft in feet per second. It only remains to divide the total number of cubic feet to be removed per second by the velocity of the air per second, and the result is the sectional area of the shaft which is sought. Let us take a simple example by way of illustration. Given the height of the shaft 50 feet, and the amount of air to be furnished 72,000 cubic feet per hour or 20 ft. per second, the formula would work out thus:—

$\frac{\sqrt{H} \times \sqrt{25}}{4} = \text{Vel. in ft. per sec.} = 9 \text{ ft.}$ $\frac{20}{9} = 2.22 \text{ sq. ft., the necessary sectional area of the shaft.}$

If the area of the ventilating shaft is given, the height being left to be determined, it is only necessary to know the amount of air to be removed, the difference between the internal and external temperatures, and to fix upon the velocity at which the air shall travel. The sectional area of the shaft must often be determined by the conveniences of construction, being governed by the plan of the building. A very safe rule is to make the sectional area of the ventilating shaft equal to the combined sectional areas of all the ducts leading into it. It is possible to secure efficient ventilation with a ventilating shaft which is somewhat smaller than this, but this is unquestionably the safest rule to follow. To determine the rate at which the air will travel, it is only necessary to divide the amount of air in cubic feet required per second, by the sectional area of the shaft expressed in

feet. With these data the determining of the required height is a very simple problem, using the formula which has already been given. An example will make this entirely clear.

Let us suppose that the conditions are as follows: air is required for 48 students. At 2,400 cubic feet per hour for each, the total amount needed would be 115,200 cubic feet per hour, or 32 cubic feet per second. The combined area of ducts of sufficient size to allow the transmission of this air at the rate of 5 feet per second would be $32 \div 5 = 6.4$ square feet, and the velocity will of course be 5 feet. The question we have to solve is what would be the necessary height of the ventilating shaft to secure this velocity, the difference in temperature being 25° F. The solution of this very practical problem is extremely simple. Bearing in mind the formula we will let H represent the height of the shaft, D the difference between the internal and external temperatures, and V the velocity of air per second; $\frac{\sqrt{H} \times \sqrt{D}}{4} = V$. Substituting the quantities which are known we have the following:

$\frac{\sqrt{H} \times \sqrt{25}}{4} = 5$. Reducing we have $5\sqrt{H} = 20$; $\sqrt{H} = 4$; $H = 16$; that is, the height of the shaft required by the conditions named would be 16 feet. In most instances it is more convenient to employ a smaller shaft and one of greater height. Let us suppose such a case, in which the amount of air required per second is the same, namely, 32 cubic feet per second, and the sectional area of the shaft 4 square feet instead of 6. Dividing the amount of air required per second by the area of the shaft we have 8 as the velocity per second ($32 \div 4 = 8$). Our formula then would be as follows: $\frac{\sqrt{H} \times \sqrt{25}}{4} = 8$, reducing we have $5\sqrt{H} = 32$; $\sqrt{H} = 6.4$; $H = 40.96$. In this case the height of the shaft would be practically 41 feet. By the same method the necessary height of shaft for any given area may be readily determined.

From an economical standpoint, other things being equal, it is far better to secure increased efficiency by increasing the size of the ventilating shaft rather than its height, for the obvious reason that the capacity of a shaft for removal of air increases directly with the increase in sectional area; whereas the velocity of the air current increases in direct ratio with the square roots of the heights of the shaft, thus requiring that the height of a shaft shall be quadrupled to double its efficiency, while it is only necessary to double its sectional area to secure double efficiency. There is also a loss by increase of friction and of cooling surface, and in the disproportionate increase of expense of construction. The cost of increasing the efficiency of a shaft one hundred per cent., by increasing the velocity of the air current, will be very much greater than in securing the same result by increasing its sectional area.

Cases occur, of course, in which the stronger draft secured by increased height of shaft is essential to the efficient working of a ventilating system, or the accomplishment of a specific purpose.

8. When possible to do so it is unquestionably preferable to so plan a system of heating and ventilation that it will operate efficiently by the aid of "natural draft" only. Such a system is as nearly automatic in its action as any ventilating system can be made. A draft which depends upon a mechanical apparatus, as a pressure or suction fan, or even upon a steam coil or other form of heating apparatus in the ventilating shaft, is very likely to be found defective when efficiency is most needed. I have visited many large institutions provided with large ventilating fans, and have never yet found one in which the apparatus was in constant operation. In many cases it had been inoperative for years and was not in running order. In one case I was informed that the fan was started "whenever the odors in the ward became so strong as to be very noticeable." To my nose the odors were at that moment very strongly pronounced, and yet the fan was not in operation. The noses of managers and attendants become accustomed to odors to the presence of which they are

constantly exposed, so that they cease to be a proper means of testing the condition of the air.

Some years ago the writer visited a large hospital, the air supply of which was wholly dependent upon a fan which was a pressure blower, and hence so constructed that when the fan was not in operation the opening for the entrance of air through the fan was very small. The fan was placed in the mouth of a tunnel nearly eight feet in diameter, just about the proper size for supplying the air to the hospital at a moderate velocity, but the opening from the fan had a sectional area of only about four square feet. The hospital had been in operation for some three years. The fan had never been in operation since the opening day, as it was run by a separate engine and was so far from the building as to require the attention of a special engineer when in use, and consequently the air supply of the hospital, which was filled with sick people of all classes, was limited to the small opening described, there being no other. It is certainly unwise to so plan the ventilating system of a large building as to make the inmates absolutely dependent upon the efficient working of a mechanical apparatus of this sort. Mechanical and other means of assisting "natural draft" are, nevertheless, valuable; and, in some instances, necessary accessories to a system of natural ventilation, especially for large buildings, as they furnish a means by which the disturbing influence of winds may be more or less completely overcome. The writer has had two large fans in use in buildings under his care for several years, as occasion has required. As usually constructed and employed, however, these appliances are almost useless from their inadequacy and inefficiency. This is especially the case when heat in the ventilating shaft is depended upon as a means of securing a strong draft, in consequence of the use of an amount of heating surface quite inadequate for the work required.

Ventilating shafts which are exposed on all sides, and even those which are placed in the outer walls of buildings must be heated or furnished with a fan to insure a constant draft. The amount of heating surface usually provided in such cases, is ridiculously small, and is not infrequently so placed as to be of very little value. When it is recalled that all the air supplied to a building must pass through the ventilating shaft, it will be apparent that a considerable amount of heat must be imparted to this air to produce a strong draft in case the chimney is so situated that the air loses a considerable amount of its heat before it is expelled from the chimney.

From experiments which have been made (Box) for the purpose of determining the heating capacity of steam pipes, we know that one square foot of surface of one-inch pipe (3 linear feet) will give off about 300 heat units per hour, or 5 heat units per minute under the conditions in which heating is required in a ventilating shaft. Five heat units will raise the temperature of 276 cubic feet of air 1° (1 cubic foot of air at 62° weighs .0761 lbs. The specific heat of air is .238. $5 \div .0761 \div 238 = 276$). Knowing the amount of air to be transmitted by the ventilating shaft per minute or second, it is easy to determine the amount of heating surface required to raise the temperature of the air one or more degrees. It is only necessary to divide the amount of air transmitted per minute by 276 to determine the number of square feet of heating surface required to raise the temperature of the given quantity of air 1° F.

Taking, for example, a case in which, as in our last illustration, the amount of air required to be transmitted is 32 cubic feet per second, or 1920 cubic feet of air per minute, we have $1920 \div 276 = 6.95$, practically 7 square feet of heating surface, or 21 linear feet of one-inch pipe, necessary to raise the temperature of the air 1° F. To raise the temperature of the air 5°, which would be quite sufficient to insure the successful working of the shaft, would of course require five times as much heating surface, or 105 linear feet of one-inch pipe.

The most economical method possible for heating a ventilating shaft is the combustion of fuel in the shaft itself. A number of years ago, in studying the ventilation of the House of Parliament in London, by the aid of the assistant engineer, who kindly conducted me through the subterranean region of this great structure, I was surprised to find that the current of air in the great towers, which are not merely architectural features but constitute the ventilating shafts of the building, was maintained by means of a great heap of burning coal, which was placed exactly in the center of the shaft upon a high platform, the top of which was at about the same level as the top of the great horizontal ventilating ducts which entered the shaft at its bottom.

Fuel may be consumed in a shaft by means of a stove placed in a chimney, carrying the stovepipe up through it. In exceptional cases the smoke may be discharged directly into the shaft; but this arrangement is not always a safe one and hence cannot be recommended. The position of the heater is a matter of no small importance. I have sometimes seen a steam coil placed at the extreme bottom of the ventilating shaft, the first opening being several feet above it. In so placing the heater, there is very little circulation of air, and hence its efficient heating capacity is not utilized. To secure the efficient working of a ventilating shaft, the heater should be placed above the highest opening. It is, as a rule, not wise to have openings into a ventilating shaft at different levels, but if this arrangement cannot be avoided, the heater should certainly be placed above the highest opening; or if a long heater, placed against the side of the chimney, it should extend above the highest opening. Whether the heat should be concentrated near the lower portion of the shaft, or should be extended some distance along the inside wall, is a question which may be differently answered according to circumstances. There is an advantage in the extension of the heater some distance along the inner wall in that a better opportunity is afforded for radiation, and thus for heating the inner surface of the shaft, and so preventing the tendency to downward currents. It should be remembered, however, that the higher in the shaft the heater is placed the shorter will be the heated column, and hence, from this standpoint, the less the efficiency of the heat employed.

In conclusion, the writer wishes to disavow any attempt to make, in the foregoing, an extensive presentation of the subject of ventilation. Those who wish to make an extended study of the subject will find the means of doing so in the excellent work of Mr. Thomas Box, published by E. and F. N. Spon, 12 Cortlandt street, New York City. My aim in the preparation of this paper has been to present such practical points as I have gathered from a somewhat extended experience in planning the ventilation of large buildings in which I have had an opportunity to live for a series of years, studying the result of various methods employed, and to formulate a few simple rules which are useful for the working out of correct methods of ventilation in all ordinary cases, and which are much less cumbersome for use than the ponderous formulæ of Box and others who have undertaken to present this subject in a scientific way. I ought, also, perhaps, to call attention to the fact that, while the physical principles relating to heating, ventilating, etc., are correctly given by Box and other authors who have given much scientific data upon this subject, the suggestions made with reference to the supply of fresh air are, as a rule, widely at variance with the conclusions at which Parke, Angus Smith, and other investigators have arrived in the study of the question of ventilation from a sanitary and hygienic standpoint, and so are not to be relied upon. For example, Box puts the amount of fresh air required for each person per hour at 212 cubic feet, which is simply ridiculous, being less than one-tenth the amount shown by ample experience to be really necessary.

THE HALF-MILLION CLUB.

WE would call the attention of the Half-Million Club to the importance of having our city properly lighted by gas and electricity during the full month, before inviting strangers from a distance to visit our city in order to gain a favorable impression of its advantages as a residence, or business headquarters.

The new rule of having the city left in the dark for eight nights each month will not favorably impress those from the east who are accustomed to see their streets well lighted at all proper times. If the city is too poor to pay for such accommodation, it had better go out of business at once. If it is good economy to be in the dark nearly one-third of the month, why not save the other two-thirds of the expense and have no light at all?

A GRAND BOULEVARD.

A magnificent boulevard fifty miles long, from San Jose to San Francisco is the latest improvement talked of; many of the leading citizens along the route are interesting themselves in having a macadamized driveway constructed. If this magnificent scheme is carried out, we see no reason why it should not be, it will make one of the finest drives we know of. Another encouraging feature of this promised driveway, is that it shows the city is awaking to the importance of making improvements and if the spirit of enterprise is allowed to develop itself it will lead to still more startling innovations, that may for a time make old fogies sick at heart, but in the end will put money in their pockets. Pluck and enterprise cause benefits to fall upon the just and the unjust.



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

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

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

SEVENING Building, Oakland, C. Mau, Architect.

PRELIMINARY Sketch of Residence at Saucelito, Marin County, Havens & Toepke, Architects.

CITY Hall, Alameda, Competitive Design, Second Prize, Edmund Kollofrath, Architect.

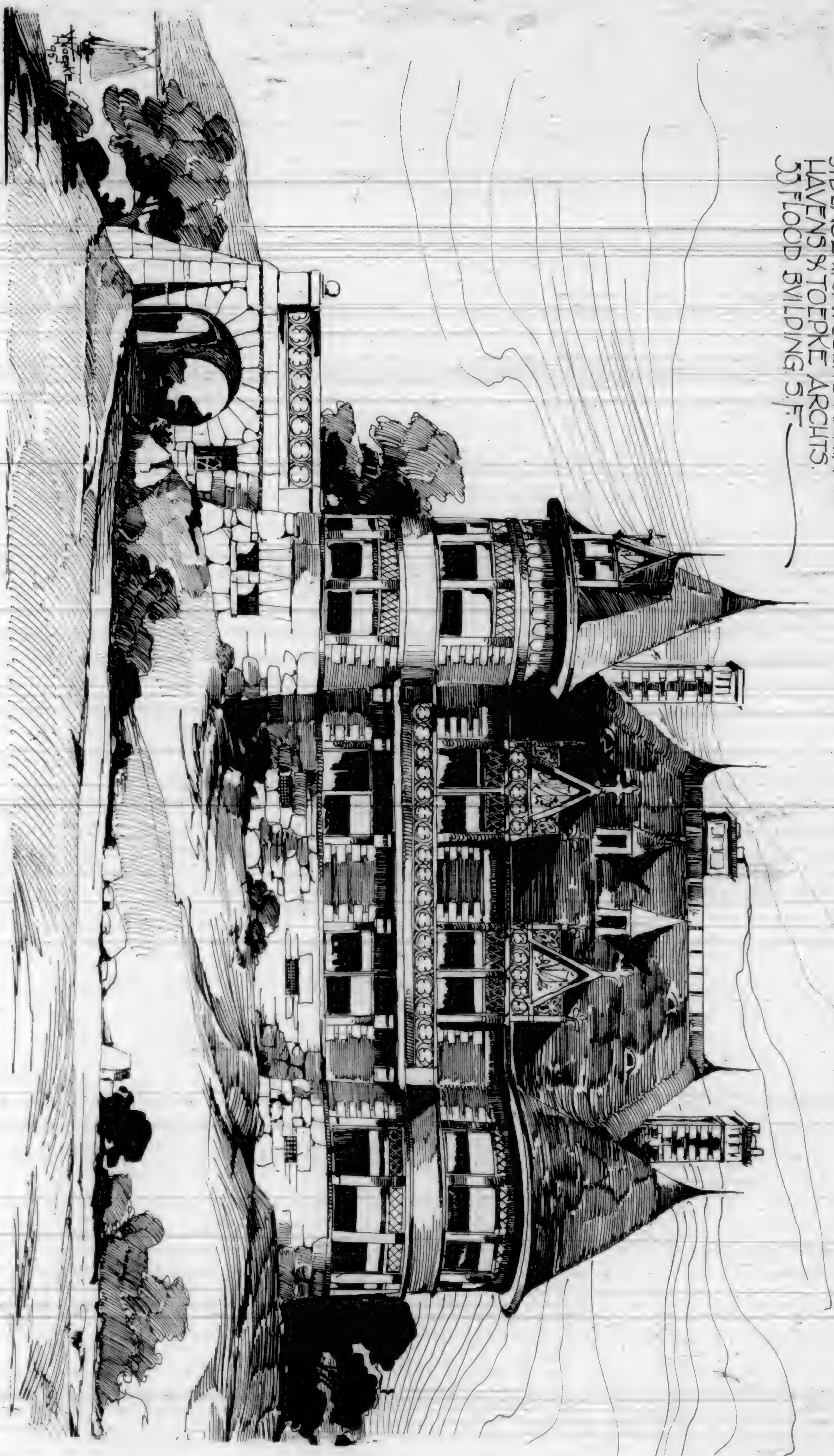
RESIDENCE at Bakersfield, Cal., Henry A. Schulze, Architect.

AS a matter of information we would state that the original building of the California Safe Deposit and Trust Company's Building was designed by Wm. Patton, Architect; the additions and alterations are by Henry A. Schulze, Architect.





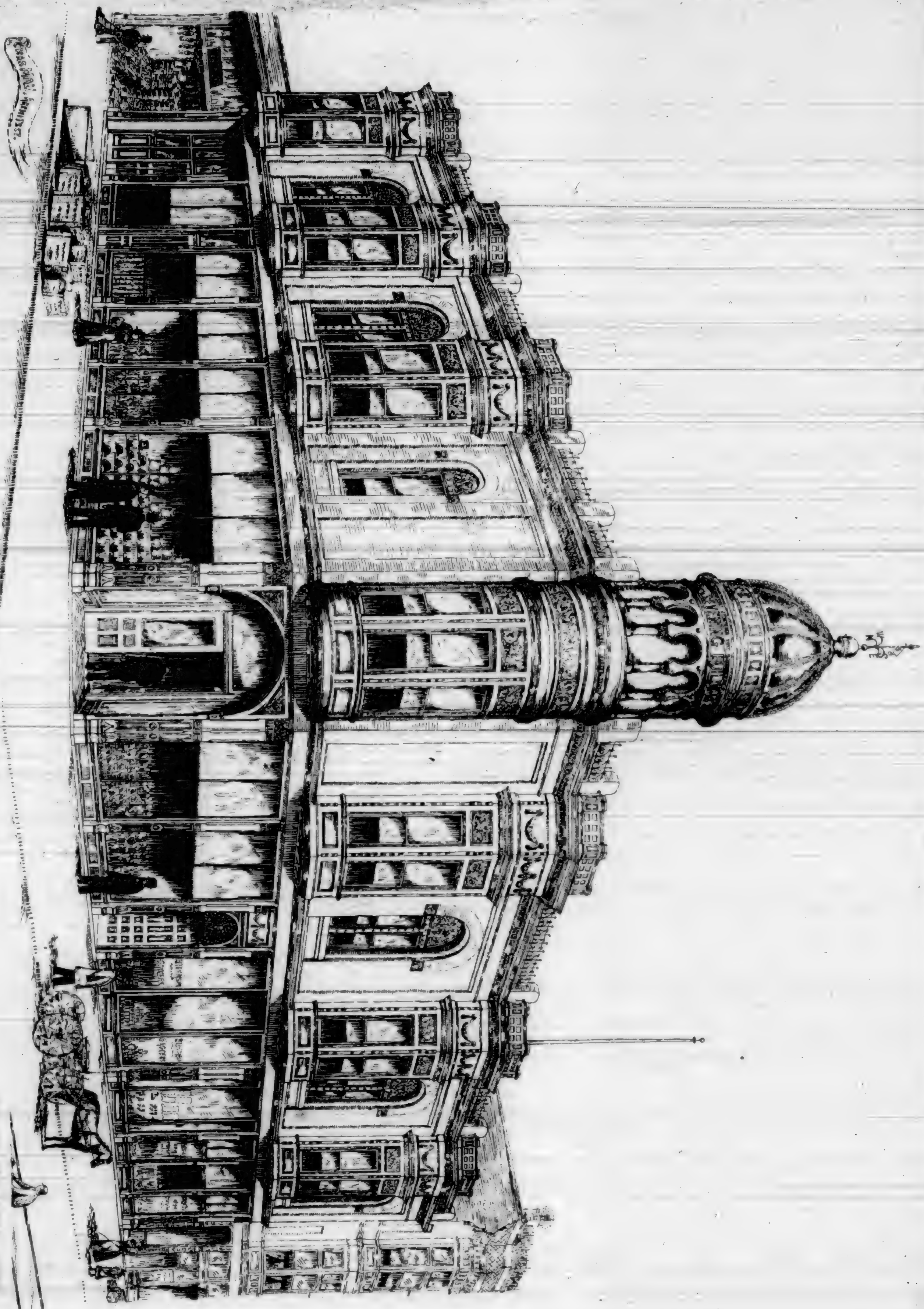
PRELIMINARY SKETCH
FOR MR. J. H. KERRIGAN'S RE-
SIDENCE AT SAN CELITO MARIN CO.
HAVENS & TORPKE ARCHTS.
33 FLOOD BUILDING S.F.



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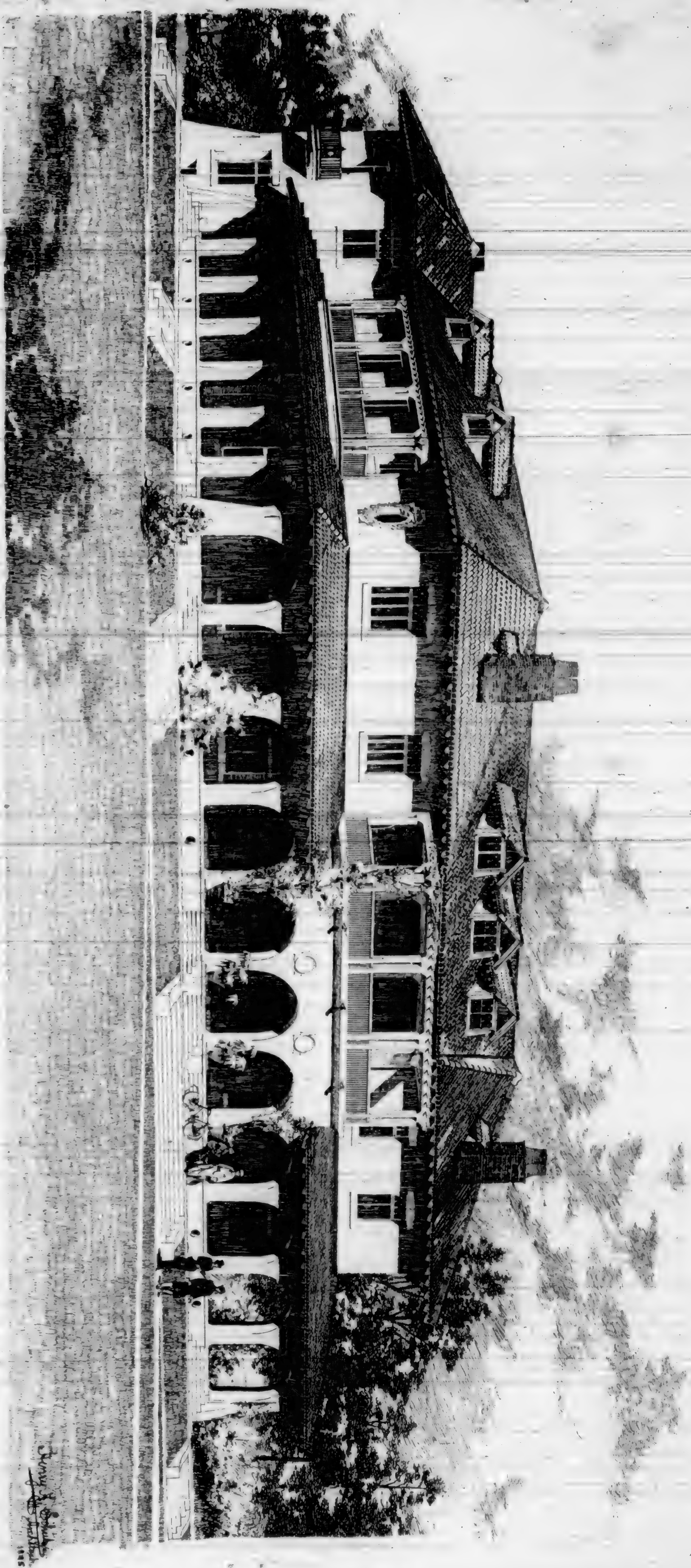
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San Francisco.

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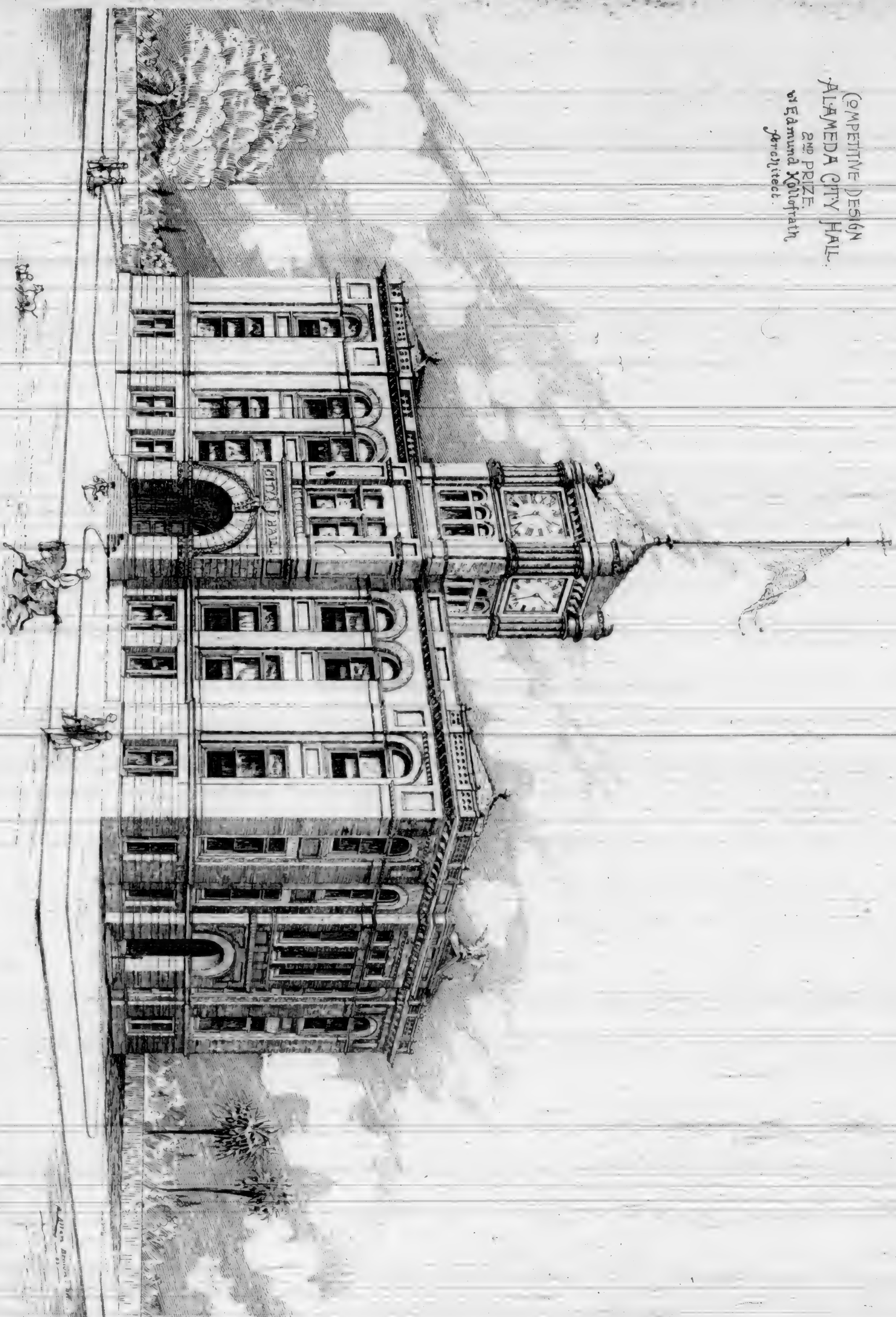
California Architect & Building News
San Francisco.

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RESIDENCE FOR W. W. S. H. ZIS BAKERFIELD CAL.

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COMPETITIVE DESIGN
ALAMEDA CITY HALL
2ND PRIZE
Edmund Kollmann
Architect.



CALIFORNIA ARCHITECT & BUILDING NEWS
SAN FRANCISCO

BRITTON & REY PHOTO LITH.

VOL. XVI No. 4, APRIL, 1895.

