

Dry Rot.

A RATHER singular accident took place a few days ago in Chicago, where a four-story brick building collapsed, early one morning, the whole interior falling into the cellar. The weakness of the structure was first observed by a boy, who saw a movement in the wall, and told the engineer, but was laughed at for his pains. Soon afterward, however, an alarm was raised, and all the persons in the building succeeded in escaping before it fell. The cause of the catastrophe is said to have been the dry rotting of the wooden girders, where they rested upon the posts. The building had been examined not long before, and pronounced safe, and it seems possible that the rotting of the timber may have been caused by painting it while green, and that the same coat of paint may have served to conceal the ravages of the fungus from those who inspected the work. Paint, which prevents the drying of the corruptible sap of green timber, is a common cause of decay, while the contact of the end grain of one piece with the side of another, as in the case of a girder resting on a post, is an equally common one, so that the safest way in buildings framed with such timbers is always to rest the horizontal pieces on iron caps or brackets, and to avoid painting until the work has become seasoned by years of use.—*Western Architect and Builder.*

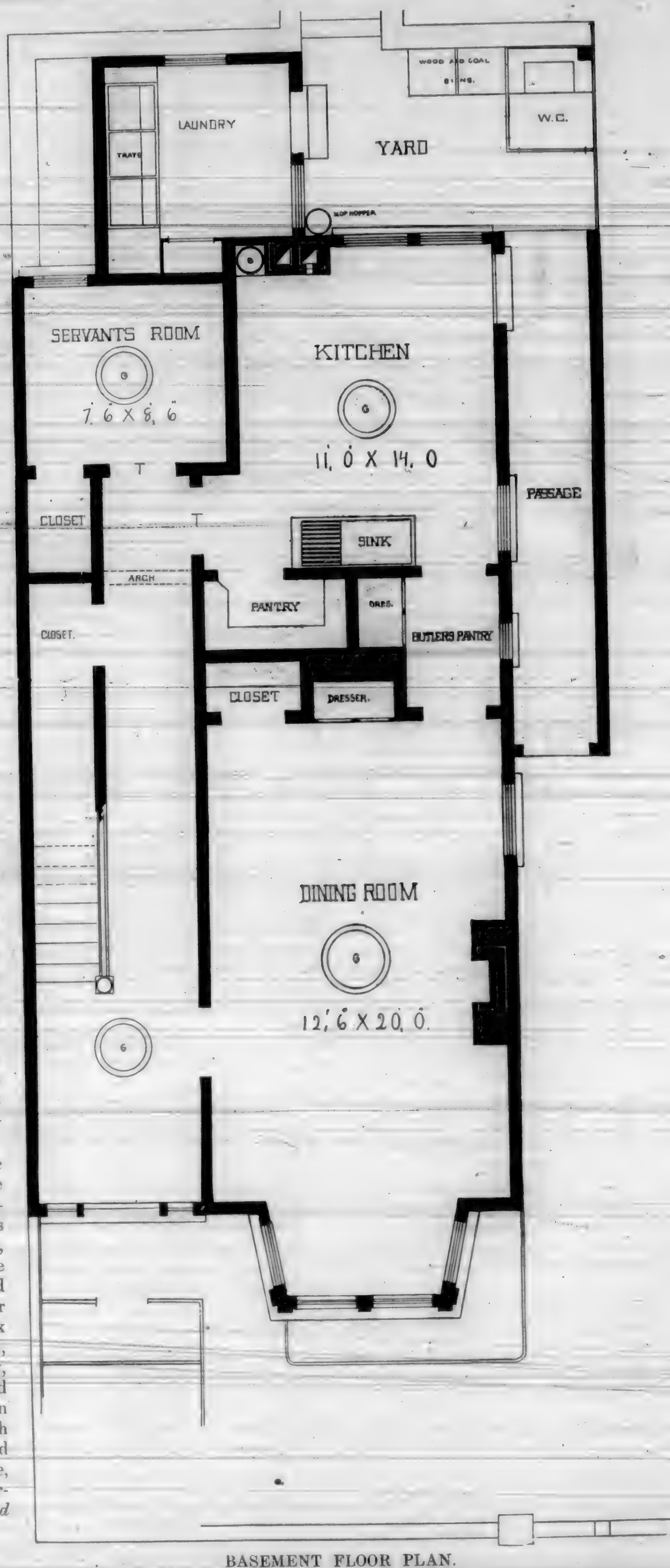
Ornamental Brick.

ORNAMENTAL bricks, in addition to being produced in the ordinary red color, are also manufactured in caustic colors, as buff, brown, chocolate brown, black, etc., and they are also enameled in any desired hue, such as red, yellow, blue, green, etc. For ornamental bricks having caustic colors the coloring oxides are mixed with the clay in quantities usually of seven to ten per cent. The coloring oxide acts as fluxes, and the composition of the body must be altered in some cases to counteract this. Ornamental bricks, like ordinary pressed bricks, are sometimes colored under the glaze. When the color is to be applied under the glaze, the burned bricks are dipped into a slip of colored clay, formed usually of one part colored glass, ground, and two parts of clay, the latter causing adhesion of the slip, and the brick is either then fired, or, after being allowed to dry, is coated with a transparent glaze and then fired; but the bricks should be heated before applying the glaze, in order that all oily substances may be removed. When it is desired to apply the colors in the glaze, the brick is dipped into a transparent colored glaze, usually formed, besides the coloring oxide, of oxide of lead, silicious sand, and salt.

All enamels and glazes for ornamental bricks are usually applied to the one face or head which will be exposed after laying in the walls, except those intended to be used for corners and reveals of windows and door-jambs, which have one face and head treated, and are termed "rights and lefts" when they are so moulded and treated that they cannot be used for any corner. The colors now mostly used for architectural decorations and chromatic brickwork are the same, with the exception of buff and brown, as those employed by the ancient Egyptians, namely, red, yellow, blue, sometimes green, and white and black. In addition to the colors which have been given for ornamental bricks, there are others which are sometimes employed, especially for interior and expensive decorative purposes; they are turquoise, bronze-green, olive-green, violet, purple, orange, carmine, pink, gray and indigo.—*Western Architect and Builder.*

PERIODICALLY complaints are made that the term horse-power is incorrect because it does not express the actual power of an average or even an exceptional horse. This really makes no difference. The animal should be entirely eliminated from the mind, and the term taken at its exact meaning, viz., the raising of 33,000 pounds one foot high in one minute of time. A horse would fall far short of doing this for ten hours in a day; a steam-engine will do it for twenty-four hours.

In 1880 the valuation of personal property in Florida was \$30,938,309. In 1885 it amounts to \$60,598,619. The increase comes from the encouragement given to Northern capital. There are other States in the South which might learn a valuable lesson from Florida. Over 50,000 Northern people have made investments in that State during the last five years, and many thousands of them have taken up a permanent residence.



BASEMENT FLOOR PLAN.

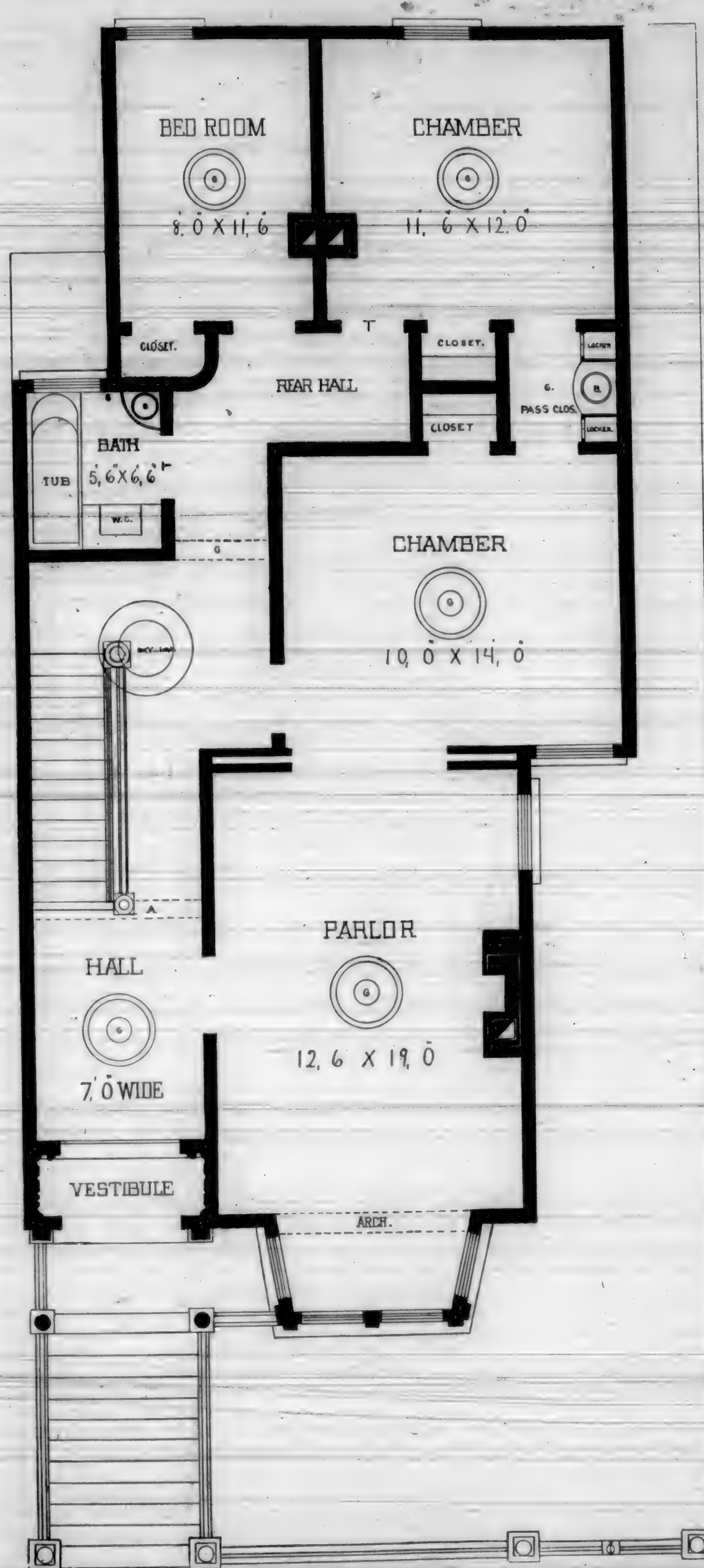
Cable Road in Denver, Colorado.

THE first successful attempt at trial trips of the new cable car was made this week in Denver, Col., over a portion of the track of the Denver Electric and Cable Railroad Company on Fifteenth Street. The car ran a considerable distance, and at the satisfactory rate of eight miles an hour. A dynamo of twenty horse-power furnishes the motive power for the car. Quite a large number of prominent citizens took rides on the car. Prof. S. H. Short, of the Denver University, has worked very hard to make his invention a success, and his efforts seem to be already reaping their reward. The company have hoped to get their cars running in six weeks or a month. The car which is now being used in making trial trips, is shaped and fitted up very much like an ordinary street-car, and is fully as handsome in its style and appointments as any street-car in Denver. It was made by Woebler Brothers, of West Denver. The dynamo and other machinery, which is located in a building near the corner of Fifteenth and Tremont Streets, and which is used to propel the car, was made by F. M. Davis, of Denver, and all the plant and material used by the company will be of Denver manufacture. Ex-Governor John Evans, W. N. Byers, Rodney Curtis, and other well-known Denver gentlemen, are among the officers and directors of the new company. Some further trips will be made by the car, and large numbers of people will undoubtedly visit Fifteenth Street just below the Court House, and between Tremont and Glenarm Streets, and inspect the invention and its workings for themselves.—*Electrical Review.*

A Magnificent Project.

AN enormous scheme for the disposal of the sewage of London has been projected by Colonel Jones and Mr. Bailey Denton. Canvey Island, in the Thames, not far from its mouth, is a low, flat island of 4,500 acres area, which, although containing a few dwellings and a church, lies below the level of high tides, and the water is kept from overflowing it by embankments 10 to 12 feet high. To this island the proposition is to convey the sewage of the metropolis, and after purifying it by lime, which can be procured at small expense from the chalk which crops out on both sides of the river near by, discharge the effluent in the river on the falling tide, the low-water level being 10 to 12 feet below the surface of the island. The solid portion of the sewage will be deposited on the surface and render the soil fertile and productive. The capacity of the island is such that it is estimated that it will take the sewage of London 100 years before it will be filled up to the level of the existing levees. If found profitable to do so, the liquid portion of the sewage might be pumped on to the mainland over a ridge 200 feet high and 5 miles off, and thence flow by gravity over a territory of 60,000 to 80,000 acres of arable land. The projectors estimate that the expenses of construction and maintenance could be met by a taxation of three-tenths of one per cent of the assessed valuation of the metropolitan district.—*Sanitary Engineer.*

THAT part of Chicago in which the new Board of Trade Building is situated, was suddenly illuminated at 5:30 Saturday, the 23d ult., by a corona of electric lamps about the top of



FIRST FLOOR PLAN.

PRINTED matter may be copied on any paper of an absorbent nature by dampening the surface with a weak solution of acetate of iron, and pressing in an ordinary copying press. Old writing may also be copied on unsized paper, if wet with a weak solution of sulphate of iron, mixed with a small solution of sugar syrup.

the tower of the Board of Trade Building, 312 feet above the street level. The plant is of 40,000 candle-power, said to be the largest mass of electric light and at the greatest altitude of any in the world. The engine furnishing the power will be started at dark every evening and run till daylight.

Graphic Illustration of Roof Framing.

(Continued.)

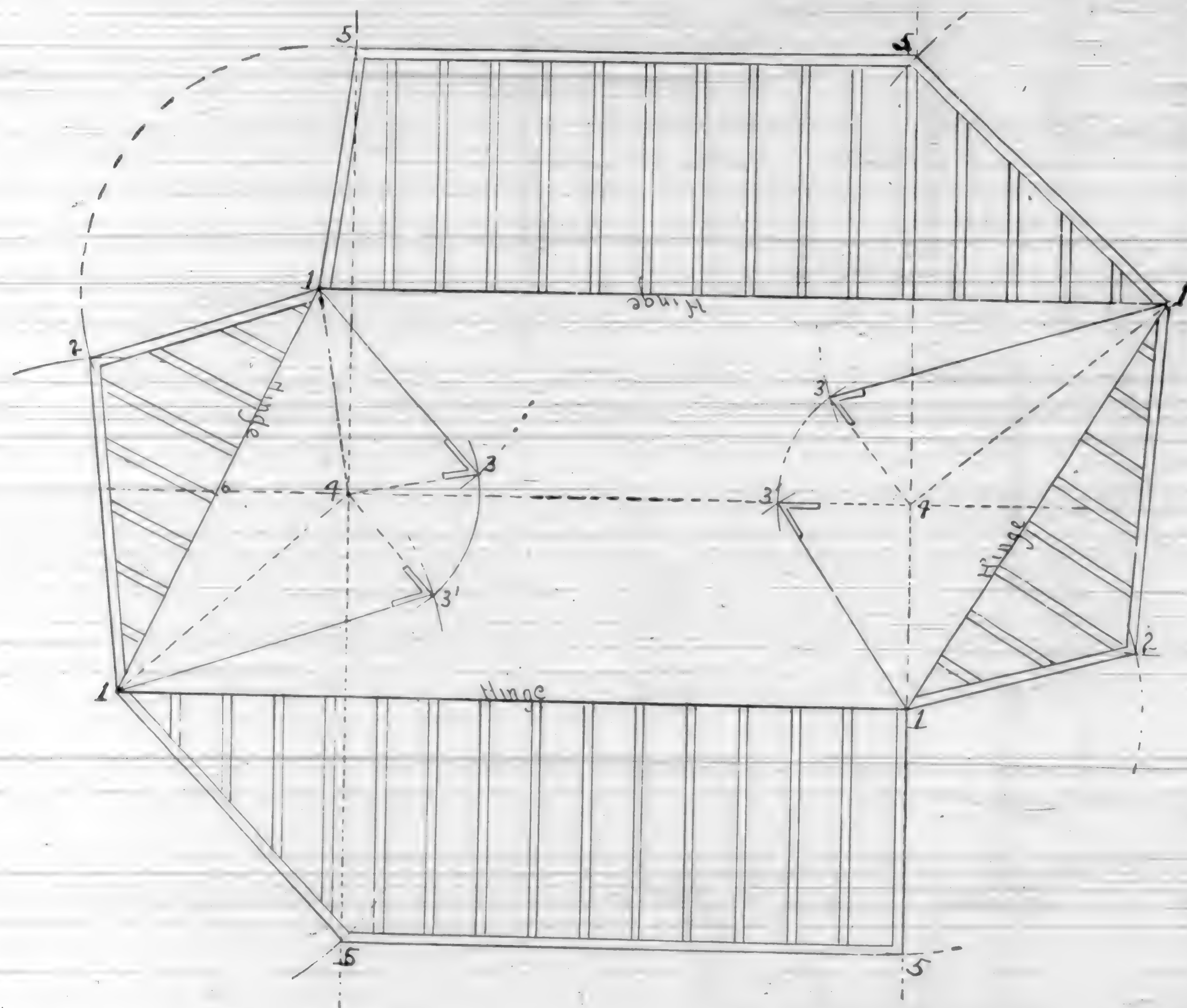
THE science of construction, through successive generations, has furnished material for all classes of interested minds and intellects, and the ever developing—new features of interest revealed by the solving of each successive problem, has served to sharpen up and vitalize ambitions and devices for other new—acquisitions in reducing to plain understanding that which has for long ages remained within the confines of unrevealed possibilities. As time rolls on, the scales of mystery continue to drop and fall, and difficult things that were, are becoming simplified and easily comprehended.

Roof construction has furnished innumerable points for solution, and the student of architecture, as well as the skillful artisan, has sought to grasp and reduce to easy mastery, the various seemingly difficult problems that have appeared. Ground plans that are regular, and of exact lateral and diagonal dimensions, to the less skillful, present no serious obstacles in the framing of the roof; but in cases where acute and obtuse angles occur, as

the desired spaces. To make a model, cut out of cardboard the form of roof as shown; then weaken the board by drawing a knife lightly around the base or hinge lines—the walls of the building—and stand up the wings, which will produce the shape of roof complete. M. J. MARION.

Red Slate.

ALMOST all of the consumers of red slate rest under the impression that it is quarried principally in Vermont. This is an error. The only red slate in the world which it has been found practicable to quarry lies in the State of New York, although some of the quarries are so near to the Vermont line that shipments are frequently made from the latter State. From these facts the erroneous impression mentioned has arisen. As in all other colors of slate, the producers make two grades, bearing the usual distinction of No. 1 and No. 2. No. 1 is selected from the entire product, and consists only of the material which is smooth in texture, uniform in color, straight and free from "knots." All the rest of the slate which lacks these qual-



shown by the accompanying illustration, a better and more thorough knowledge of the rules and principles of construction becomes necessary to a skillful manipulation of the material employed.

EXPLANATION.—The method illustrated by the accompanying diagram explains an easy and practical way of obtaining the results presented, which its author has applied successfully for many years:—

1 1 1 1 are the lines of ground plan; 6 4 is the height of elevation. Connect 1 4 as shown at each corner. Square out to 3 on each line; make 4 3 3, which gives the height of elevation. Connect 1 3, which is the length of hip rafters. Square out from 4 to 5, 5 5 5; then take the distance 1 3 in the compass, standing in 1; describe curve, cutting line 5, and again take 1 3, which is the shorter hip; stand in 1—draw curve cutting line 5, and bisecting curve 5 to 2—connect 5 1 1 2 2 1, and 1 and 5. This gives the length of hips in position.

The above applies to either or both ends of the roof—each being of like shape and proportions. Place the jack rafters at

ities is called No. 2, or second. Independent of this classification there is another concerning the color, which implies the dark red, medium, and the light or pink. The dark and medium colored slate is the best and strongest, and possesses that quality which roofing slaters always seek, called "metal," and roofing of this variety forms probably the handsomest covering which it is possible to obtain. The lightest or pink is apt to be brittle, and is not so strong, although some slaters prefer it because of the brighter hue. It is also apt to fade. For general purposes, such as strength, beauty of appearance and unfading quality, the medium bright red is deservedly the favorite. As stated above, it is found under producible circumstances only in New York, although veins have been discovered in other States, but they have not yet been found in sufficient quantities to be utilized.

In Patagonia they fine a man two goats for killing his wife. The law is very strict on the subject, too, and if the fine isn't promptly paid he is compelled to marry again. This makes him hustle for the goats.

Large Plate Glass.

THE largest plate glass in use for store show-window purposes in San Francisco are those in the Murphy Building, corner of Market and Jones Streets; in all, forty-six sheets, running in sizes:—

2 plates.....	150x160 inches	2 plates.....	98x160 inches
2 ".....	142x160 "	2 ".....	64x160 "
4 ".....	136x160 "	1 ".....	70x130 "
1 ".....	130x160 "	2 ".....	70x150 "
1 ".....	128x160 "	4 ".....	70x136 "

The remaining sheets run 48x160, 28x130, 70x142, 70x128, etc. The handling, setting and glazing work was done under the direction of Mr. Thos. C. Butterworth, glazier, No. 7 Ninth Street, with mishap to but one sheet, which was made the subject of several very hypothetical newspaper items; but which in fact was no more than the fracturing of the lower end of one of the lights to a small extent.

The successful handling and placing of so many large, heavy sheets of plate glass, certainly evidence skill on the part of those doing the work; and had at least one of the lights been destroyed by accidental breakage, it would not have been a matter of any great surprise, as glass is a risky article to handle, requiring but slight violence to produce damage or total loss.

Size of Soil Pipes.

THE size of soil pipes should not exceed four inches. This is ample to carry off every possible form of discharge or combination of discharges to be met with in plumbing, even in the largest buildings, except for special hotel, laundry or manufacturing purposes. It is a mistake to suppose that because the fixtures are multiplied, the diameter of the soil pipe must be increased correspondingly. It is a rare occurrence, even in a hotel building, that several water-closets are fluted at exactly the same instant, and even if they were, their distance from each other, and the capacity of a four-inch pipe, would give ample room for the escape of the water. The choking of a pipe is far oftener due to its being too large, or to faulty construction, than to its want of sufficient size. The great perpendicular extension of plumbing pipes also facilitates the discharge, and pipes, which for land drainage would be much too small, will be found ample for plumbing purposes, on this account.

When it is considered how important it is that soil and drain pipes should be as thoroughly scoured as possible by the discharges sent through them, and remembered that the smaller the pipe the more perfect the flushing, we should be inclined to reduce our soil pipes to a size even smaller than four inches, were it not for the careless usage slop hoppers and water-closets are so often subject to.

The trap of water-closets is frequently made of pipe as much as four inches in diameter, and large pieces of newspaper are often used where toilet paper alone is suitable. This, and the carelessness of servants who will throw into a closet anything which is small enough to pass through its trap, would cause a great amount of annoyance and expense if the soil pipe were smaller than the trap of the slop hopper or water-closet. Hence, we have fixed upon four inches as both the smallest and largest size of soil and house drain pipe, and no other size should be used except for rare and exceptional cases.

In Minneapolis, Minn., during the year 1885, there was expended in new buildings over \$9,700,000, with which were erected 2,907 residences, 43 manufacturing establishments, 22 churches, 10 school-houses, 16 store-houses and elevators, 8 city buildings, and 150 business blocks. In St. Paul the amount expended for a similar purpose was \$7,234,834, and the number of buildings erected was 3,451.

San Francisco Chapter.

OWING to a change in the time of issue of this journal, the 5th inst., and the monthly meeting of the Chapter occurring on the same day, report of proceedings will necessarily lay over until the March issue.

VERMONT has joined the onward march of civilization. The star of empire which has for a number of years been monopolized at the West, is to be lured back to its starting point on the eastern shore of Lake Champlain. A street-car line, the first ever built in the State, was formally opened the other day in Burlington, with demonstrations suited to the importance of the event. Bands of music, speeches, rockets, Chinese lanterns, illuminated stores and dwellings, and a decorated car drawn over the line by six mules, gave significance to the occasion. It must be said, however, that the success of the enterprise was largely due to local rivalry, the citizens of Burlington having heard that a similar project was on foot at Rutland, which is only a village, with selectmen and fence-viewers, while Burlington is a city, with a mayor and ash-inspector.

Since the cable street railroad in Chicago was opened, there have been a great many improvements on the system patented, but the improvements do not run away from the original very fast. It was assumed that the gripping device was too cumbersome and heavy for Eastern refinement, so when the Brooklyn bridge was provided with a cable road, a brand new grip was adopted, the production of the matured genius of New York. That grip was a shining success only in one way. It gave daily lessons of patience to the restless people of Brooklyn by its numerous failures to move the cars for half an hour after an attempt was made to start. The people of Philadelphia were above borrowing any part of the cable system from Chicago or San Francisco, so when they built a road in Market Street, they adopted an original system entirely. It is being operated now the greater part of the time by the help of horses. On a recent juncture, the grip took occasion to vary its record by holding, and it held so well that the man in charge could not induce it to let go; so the car went tearing along like a Juggernaut vehicle, smashing everything within reach. There are indications that the new cable road opened in New York will be a most uncertain means of getting around on, but the promoters of the company have the satisfaction of knowing that they succeeded in eluding the patents that cover the system of operating the older cable roads.—National Car Builder.

THE FIRST TRAPPED WATER-CLOSET on record is that invented by Alexander Cumming, and patented in 1775. The basin is bowl-shaped, and the water is delivered into the lower part instead of at the top, while the soil-pipe is recurved about 12 in. or 18 in. below the basin, so as to constantly retain a quantity of water sufficient to cut off all communication of stench from below. In 1777 another water-closet was patented by Lemuel Prosser, but does not appear to have been adopted; in 1778 the well-known valve-closet of Bramah was patented. The expensive character of Bramah's arrangement led later to the introduction of the pan-closet and D-trap, which are now being removed wherever this can be done. Dr. Corfield then proceeded to describe more in detail the various apparatus in use, and the methods of disconnection of waste-pipes from drains, as well as drain ventilation. In conclusion, attention was directed to the decision of Mr. Justice Quain, that it was implied in an agreement for taking a furnished house for a short period that the house was fit to live in; and as to the proposal to introduce a similar provision for unfurnished houses into the Housing of the Working Classes Act, Dr. Corfield thought it was wise to limit this provision to houses occupied by the laboring classes, as it would otherwise have led to an excessive amount of unnecessary and vexatious litigation. He was of opinion, moreover, that the certification of houses as to their sanitary condition by local authorities would be unsatisfactory, and that greater good would be done if this were left to individual effort.—Sanitary World.

THE fact is, a man gets religion a good deal like he gets the measles. A fellow gets tangled up with the measles, and in about ten days the doctor comes, gives him a cup of good hot tea, and tells him to keep on taking that until it breaks out; and then keep it broke out, and he will be all right. So some of you have got tangled up in this meeting until you feel as bad as a fellow with the measles before they break out. A few hot cups of gospel tea will make religion break out all over you. Then keep it out, ar' you are all right. But, like the measles, if it goes in on yea, it will kill you, sure.—Sam Jones.

anne
phre

Presidio Reservation. Two two-story frame tracks, brick foundation. O.—J. S. Government. A.—J. H. Humphreys. C.—J. S. Tebbala. \$10,000. Pierce, nr. Sutter. One-story me. O.—S. H. Shanks. \$2,400. Post, cor Scott. Two two-story frames. O.—Mrs. Rebecca M. Davis. A.—Copeland & Banks. C.—Geo. R. Lang. \$14,000. Post, nr. Scott. Two two-story frames. O. and B.—J. C. Wier. Day work. \$8,000. Pine, nr. Steiner. Additions and alterations. O.—John Kelly. Day work. \$2,500. Sixth, bet Howard and Folsom. Additions and alterations. O.—W. Bloom. A.—S. & J. C. Newsom. C.—J. H. McKay. \$2,000. Sutter, bet Leavenworth and Hyde. Two-story frame. O.—B. Marshall. A.—Eisen & Pierce. C.—Moore Bros. \$5,500.	Stockton, southeast cor. Stockton Place. Five-story and basement brick. O.—L. & M. Sachs. A.—P. R. Schmidt. C.—McGowan & Butler. Carpenter Work.—T. Riddell. Iron Work.—O'Connell & Lewis. \$65,000. Sacramento, bet Franklin and Gough. Additions. O.—E. F. Preston. A.—Curlett & Cuthbertson. C.—D. Perry. \$6,000. Sutter, west of Larkin. Four-story and basement frame. O.—A. McDougall & Son. C.— \$20,000.	Treat Avenue, nr. Twenty-first. Two-story frame. O.—H. Birth. C.—W. Shiffeld. \$3,550. Washington, nr. Baker. Two one and one-half story frames. O. and B.—W. Plums. Day work. \$5,000. Central Avenue, nr Willow—1-story etc; o, C. C. Kinsey; a and b, F. N. Delaney; \$3,000. Central Avenue, nr Union—2-story fr; o, C. H. King; a and b, F. N. Delaney; \$3,000. Park, nr Central ave.—Additions; o, Methodist Episcopal Church; c, Jackson & Johnson; \$500. Santa Clara Avenue, below McPherson—1½ story fr; o, H. Spetz; c, S. W. Ducker; \$2,500.	Washington, bet Fillmore and Steiner. Two-story frame. O.—Mrs. M. J. Meek. C.—J. C. Wier. \$4,000. Washington, cor. Stockton. Alterations. O.—Methodist Chinese Mission. A.—J. Marquis. Day work. \$2,000.
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ALAMEDA.

OAKLAND.

MISCELLANEOUS.

Either of the Books mentioned below, and the California Architect for 1886, will be sent to any address upon receipt of price mentioned California Architect and Building News, \$2.00 per Year WITH

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Advertisements inserted at reasonable rates.

SAN FRANCISCO, CAL., MARCH 5, 1886.

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What They Say.

"A Journal of Architecture. The first number of the eighth volume of the CALIFORNIA ARCHITECT AND BUILDING NEWS appears in an enlarged form and new type. These signs of prosperity denote an appreciation of the journal by the class in whose interest it is ably conducted."—S. F. Chronicle, January 18, 1886.

"The Architect's Organ. The CALIFORNIA ARCHITECT, a monthly published in this city, has been enlarged and much improved, and the number issued to-day is one that would be a credit to any city. It is a publication that should be of great use to property owners and those who contemplate building."—Stock Report, January 16, 1886.

"THE CALIFORNIA ARCHITECT AND BUILDING NEWS comes to us with the opening of the new year very much enlarged and improved. It holds its own remarkably well against the older Eastern journals of the same class."—The American Building Association News, Chicago.

"THE CALIFORNIA ARCHITECT AND BUILDING NEWS for January comes to us in a new dress, and generally improved make-up, which renders it more acceptable than ever. It is always replete with valuable matter concerning the interests it advocates, and is ever an acceptable visitor, not only to the craft, but to those who desire to know whatever best applies to the most acceptable methods of architecture."—Alameda Enquirer, February 3, 1886.

In a recent trip of the steamer *Burgos*, from England to China, during the first part of the voyage, from Plymouth to Alexandria, the consumption of coal was 282,240 pounds, the distance being 3,380 miles; the consumption per mile was, therefore, only 83.5 pounds, and the consumption per ton of cargo per mile, 0.028 pound; in other words, half an ounce of coal propelled one ton of cargo per mile.

Quarterly Review of Building Activities.

ALTHOUGH the figures presented in this article show considerable decrease in building activities as compared with the third monthly report of last year, and the quarterly report ending March, 1885, there is a good feeling among all classes of real estate owners, and very many express the intention of early commencement of new improvements.

Except among the chronic croakers who fail to discern a single ray of light even at noonday, confidence in future building movements is freely expressed, and at the slightest impulse or inducement a moderate, if not vigorous, boom in building is likely to start up. There is but little let down in the rates of rentals, and the number of vacant houses, stores, etc., is by no means large, nor nearly equal to what it has at times been in San Francisco, notwithstanding the rapidity with which new buildings have been erected within the past five years. Nor is the demand at all likely to diminish, with the increase of population steadily going on by natural augmentation from marriages and births, and the settling down upon this coast and in this city of tens of thousands who prefer the genial climate of California to the cold, frozen, snow-bound, blizzard-desolated sections, where not only common personal comforts are jeopardized, but life itself, to a certain extent endangered.

REPORT FOR MARCH, 1886.

87 Frame Buildings	Value, \$311,055
2 Brick	26,200
12 Alterations, etc	21,830

101	Total value for March	\$359,085
	Total for January, 1886, as previously reported	623,250
	" " February, "	377,197

Total first quarter, ending March 5, 1886...\$1,359,532

NOTE.—The quarterly reports in this journal being made in its third, sixth, ninth, and twelfth issue for the year, and the day of issue being the 5th of each month, December of each preceding year is made a factor in the respective reports.

January, 1885	— 73 buildings reported	Value \$590,750
February, "	— 121 "	" 608,850
March, "	— 97 "	" 768,750

Total first quarter in 1885...\$1,967,750

The above figures show a falling off from the first quarter of 1886, as compared with the corresponding quarter of 1885, of \$608,218. But this scarcely represents the actual condition of the building interests, as the grading work of the Flood Building, corner of Market and Fourth Streets, is under way, but not included in the above, and the figuring for the other—constructive works—is in progress as we go to press. The total cost will reach in the hundreds of thousands of dollars, and will be a large item in the report for April.

The Nightingale Building, Market and Franklin Streets, is also under way, and only \$11,504 of its cost included in the report of this month, whereas its total cost will be several scores of thousands of dollars.

In further modification of the foregoing figures it may be stated that the engagements for present quarter include but four over \$50,000 each, to wit: one of \$130,000, one \$90,000, and two of \$80,000 each, or a total of large jobs of \$380,000; while for same quarter in 1885, there were reported two of \$300,000 each, one \$80,000, one \$90,000, and one \$53,000, a total of \$823,000—a difference of \$443,000 on large jobs, which would place the quarter of 1886 only \$165,218 short of 1885 on residence, tenements, and the general class of buildings, so that, with the several large jobs approaching contract, it is altogether probable that the semi-annual showing for 1886 will equal that of the preceding year.

Other prominent buildings than those mentioned, upon which work has been actually commenced, but which, as a whole, have not matured into contracts for the whole work, will swell the future reports for the year sufficiently to overcome the shortage thus far reported.

There is also considerable activity in smaller constructions, and many of the architects' offices are "full of work."

ACCURACY OF BUILDING REPORTS.

The reports made in this journal are more nearly correct and reliable than any other. The attempt of some of the daily papers

to manipulate building reports do not represent actual facts. Engagements are sometimes repeated, and, for appearance sake, cases reported by this journal two or three months previously, are utilized to "make a respectable showing." It will be found by comparison that the weekly reports of a daily contemporary which pretends to supply its readers with reliable information, that while for the month of March, including the four weeks prior to date of present publication of this journal, said journal reports a total of 62 buildings at a total cost of \$341,600, we give, for the same period, 101 engagements, at a total of \$359,085. Difference in number of engagements, 39; difference in reported cost, \$17,485, thus showing that our contemporary, with its 39 buildings less, reached within \$17,485 of the total cost of our 101. This, if the weekly report of building intelligence represented the facts as to actual cost of the 62 buildings reported, the additional 39 buildings reported by us would cost but \$17,485, or an average of less than \$450 each, which is not a fact.

The reports from Oakland, San Jose, Sacramento, Merced, and other places outside of San Francisco, are light; but this may be accounted for by the heavy rains of the season, which renders building operations outside of cities difficult, if not impossible.

The Present Great Question in California.

WE have so frequently and plainly stated our position upon the Chinese question that no one who reads this journal should mistake or misunderstand our views. From the days of its infancy, until now, there has been but the one sentiment expressed in these columns,—that of absolute opposition to the Chinese as part of the population of the United States. The record will show that long before many of our contemporaries on this coast yielded to the power of argument existing in the actual, living facts of the case, this journal contained and expressed earnest and honestly conceived and believed convictions that the Chinese were in every sense an objectionable and undesirable element in social and business life in California; that not only labor was demoralized, and wage-earners of Caucasian blood debased and injured, but that manufacturers and producers of every class were being crowded to the wall, and that it was only a matter of time when the manufacturing and monied interests of the country would feel the pressure and begin to cry out for relief. That time has come, and from one end of the Pacific Coast to the other the sentiment expressed tallies with those to be found in the early numbers of this journal.

California Architects Inactive.

THE Chapters and Associations of Architects in the Eastern and Western States seem to be alive and engaged in earnest work, not alone in personal interests, but to all the great issues and matters involved in and relating to the more perfect, enlightened, and intelligent practice of the profession, to a fuller and better understanding of the innumerable features and principles of construction, and the endless involvements that surround and are interwoven in the study and delineation of the science of architecture.

The architects of these extreme Western States, however, seem at ease, content with the pursuit of individual success, leaving the profession, outside of personal practice, but little cared for. True, the sessions of the Chapter are held monthly, and a certain amount of routine work is done, and many excellent things contemplated, projected, and proposed, but for the want of earnest workers but little is accomplished. In all matters of general interest there must be hearty and united co-operation and determined effort to produce results of any value. It may be that we of the Pacific Coast know it all—each for himself; but more probable that a stirring up of matters, and delving after facts, figures, and secrets, at present unseen, would reveal something worth knowing. This will come to pass when the restrictions of individualism and personal views and ideas yield to a broader and more general spirit of advancement and improvement.

Important to Contractors and Owners; Lien Law Issue.

SECTION 1183 of the Mechanics' Lien Law provides that all contracts amounting to one thousand dollars and more shall be "filed in the office of the County Recorder," etc., "otherwise they shall be wholly void, and no recovery shall be had thereon by either party thereto; and in such case, the labor done and materials furnished by all persons aforesaid, except the contractor, shall be deemed to have been done and furnished at the personal instance of the owner, and they shall have a lien for the value thereof."

The validity of the above piece of special legislation is likely

soon to be tested under the operation of the provisions of the lien law—special in that it discriminates against contracts for building and constructive works, etc., and not against contracts in general for similar amounts. Hence its application is special and discriminating, and consequently unequal and unconstitutional; and further, special in character, as it is well known that the above and other amendments were manipulated and put through the legislature by certain influences, for special, personal considerations and interests, violating all principle of law and equity in the creation of preferred creditors, first, in securing to workmen their pay, which is reasonably right and proper; secondly, making the material man the next in order of payment, leaving what balance of contract money there may be to be divided among the sub-contractors—stair-builders, painters, plumbers, plasterers, bell-hangers, etc.—the latter, if there is not enough left to pay them in full after the workmen and material men are paid, are compelled to accept such percentage of their claim as the unconsumed balance of contract money will give them.

The Supreme Court, however, by a recent ruling has promulgated a theory and construction of the lien law which clearly indicates fatality to the foregoing, whenever the issue reaches that tribunal for decision.

The case giving rise to this article is that wherein an owner entered into a contract with a prominent and responsible contractor for the erection of a building, which was carried through to completion in a satisfactory manner, the stipulated payments having been properly made during the progress of the work, under the terms of the contract, signed by both of the parties in interest, but not "filed," as directed by the lien law, with the County Recorder.

The owner, by some means, discovering that the lien law released her from all further financial obligations to the contractor, by reason of the non-filing of the contract, although she had received and was in possession of his material and labor, declined further payment, because the law reads that "no recovery can be had by either party." Consequently, the contractor has no protection under the law to recover his rights, nor against the dishonesty of the owner to pay what she owed and had agreed to pay. An owner who receives building values and refuses to pay for them under any equitably right circumstances, should blush to make any pretense to honesty of heart or principle.

What though a legal farce, manipulated into a form of law, renders it possible for the obligor to escape his or her obligation, the moral aspect of the case furnishes no color of integrity in the party seeking shelter behind the flimsy subterfuge of an unrighteous law.

But, in the case in question, the biter will be bitten, as a score of liens have been filed, all of which are almost certain to result in judgment against the owner, and if each is prosecuted separately—as they should be for the purpose of enlarging the legal dose as much as possible, each carrying separate attorneys' fees and Court, trial, and judgment costs—it will require considerably more than the sum due as balance of contract money to settle all the claims.

Liens—Rights of Farm Hands.

SINCE the publication of the Mechanic's Lien Law in book form, by this journal, we have been called upon to answer numerous questions. Among others, "Have farm hands the right of lien on the farm or lands upon which they perform labor?" We find no special provision for such cases. If the labor performed is in the building of fences, the erection of sheds, barns, houses, or constructions of any sort, a lien thereon will lie under the general lien law; but the only recourse for wages for usual, ordinary farm-hand labor is as found in the book referred to, which contains all lien law enactments in this State.

EDITOR CALIFORNIA ARCHITECT:

Dear Sir—In your article, "Profits on Building Contracts," appearing in the last number of the CALIFORNIA ARCHITECT, you endeavored, if I understand it rightly, to set up the theory that contractors, as an average, get nothing out of their contracts, or at most their profits are very small. To a certain extent, perhaps, you are right, but permit me to suggest to you that such results are, commonly speaking, the experience of all business men. The losses that occur from time to time, through bad debts, depreciations, fluctuations, etc., are such that the final results of each year, particularly during years of light trade, so far eat up the profits that should be that merchants, manufacturers, producers, and dealers generally often find themselves but little better if not worse off at the end of the year than at the beginning.

I query, therefore, whether in your otherwise well-written

and interesting article, you have not strained points a little to make out a case. True, there is nothing unusual or surprising in the fact that the building business is at times to some unprofitable, as it is but a common experience with all businesses. You theorize well, and are right in many of your conclusions, but you make a mistake in applying them specially to the contracting business.

MERCHANT.

In answer to "Merchant" we reply that his criticisms are very like the scrutinies of the men in the contracting business, who, by their short-sighted errors in figuring, establish the condition of things set forth in the article referred to, i. e., too limited in scope. He fails to comprehend the situation, or to take in and apply all the facts. It is true, as he states, that thousands of men run their business with but little average profit, and many find, by taking stock and balancing accounts, that the losses by failures and bad debts more than counterbalance the gains and profits. This is a usual and universal experience in all business operations where the possibility of losses attaches. If a merchant or dealer in any line of trade or commerce makes a lucky hit, and realizes a profit upon a month's transactions, amounting to one, five, or fifty thousand dollars, and the succeeding month, by failure of creditors, or unfortunate speculation, loses an equal amount, he is no better off than if he had done nothing within the time; or even worse than that, for current expenses necessarily would be greater in transacting a considerable amount of business than if no goods or merchandise whatever had been moved or handled; and with the gains and losses equal in the direct transaction, the wears and tears and incidentals would of course work an actual loss.

A STRONG POINT OVERLOOKED BY "MERCHANT."

While all as above stated is true, there is a material factor in the case which seems to have escaped the notice of our correspondent—that is, that the business contingencies of losses by failure of creditors, depreciation of values, unprofitable ventures, reverses in speculations, etc., do not exist in building contract operations. When a contractor enters into a contract obligation with an owner—presuming always that the instrument of agreement is properly drawn and signed—he receives in and by the document, a guarantee that secures him beyond all peradventure, against any possible loss, as far as the contract amount is concerned. The owner, by signing the contract, not only agrees to pay a certain sum of money for a specific purpose, but he virtually pledges and incumbers his land, as well as the erections to be made under the contract, as security for the faithful payment of the contract amount. This pledge and incumbrance may not be, and is not a direct, personal, voluntary act, but it is equally binding and secure, being made so by the laws of the State, to wit, the Mechanics' Lien Law, which stands unimpeached, and by the highest legal tribunal pronounced valid, as between owners and contractors, for the full amount of contract money; so that the latter is twofold secure in any contract undertaken, first by the owner's personal obligation and agreement to pay, and secondly in the sure and certain security provided by law in the land and improvements covered by the contract. Consequently, none of the uncertainties, contingencies, and risks that attach to general trade and transactions apply in the case of building contracts, as the full sum of contract must be paid, under any and all circumstances, by the owner, either voluntarily or from the proceeds of the sale of his lands and improvements, as by law provided. Contractors cannot, therefore, possibly suffer any loss as far as the sum of contract is concerned.

Hence the conclusions of the former article on the subject matter involved were and are correct; for contractors always receive the full sum of contract, except in isolated cases where, from a disposition of pure meanness on the part of owners, contractors submit to the shaving process in settlement to avoid lawing, or where the shaving has been done by the contractor, by imposing inferior material or workmanship, or both, and the owner rightfully refusing to pay without some abatement as an equivalent for the omissions and wrongs practiced.

Piecework vs. Subcontracts.

IT is argued by some that piecework and subcontract work are synonymous terms, and that in all cases of house construction, piecework is practiced in every instance of subcontracts. This is an erroneous and forced construction, viewed in the light of the common usage of the expression. Subcontracts, as a rule, carry with them the finishing or value of certain materials as well as labor. An original contractor may, and often does, include in his contract the erection of a building as an entirety; yet his special branch may be that of mason or carpenter. Consequently, it becomes a necessity that he segregate the several branches of the work, and sublet the same to those

specially engaged in the respective departments; as, the mason work to a mason; the plastering to a plasterer; the plumbing to a plumber; the painting to a painter; the stair work to a stair builder; the bell work, glazing, etc., to those engaged in the several lines respectively, each and all of whom are supposed to furnish all necessary material for the respective purposes. But at the same time, the labor alone of each department may be made a matter of subcontract, and so far assume the character of piecework.

Piecework, as generally considered and understood, is an entirely different affair, and means the segregation and letting of portions of the labor at a stipulated price, instead of the same being done by regular day work. For instance: a contractor, to relieve himself from all uncertainties as to the cost of labor on any portion of the work, may let the same piecework, by agreeing to pay a party or parties a certain sum to erect the frame of the building; to put on the rustic or wall boarding; to lay the floors; to trim the house, i. e., put up all the wainscoting, case and trim openings, hang doors, blinds, etc., and so cut off all labor-paid day wages, all of which means just two things: first, the contractor by thus piecing out the work, runs no risk as to the cost of the labor. Second, if the labor so pieced out is reasonably worth more than the sum agreed upon with the pieceworkers, and is less than the cost originally estimated and included in the contract amount, the contractor saves and pockets the difference, and the pieceworkers lose accordingly, compared with fair day wages, or they must put in extra hours per day, or work more incessantly—slavishly—to obtain usual wage rates of pay, or what is worse, slight and both the work all that is possible, so as to drive through each day enough to bring them out even.

Another and serious feature of the case is that pieceworkers, as a rule almost universal, are inferior men and poor mechanics, men who find it difficult to obtain steady work by the day, either because of their mechanical inferiority, or a predominant disposition for killing time, and doing less than good hands willingly and naturally put through as a rightful duty to their employers and in justice to themselves as men; for a good and honest journeyman mechanic entertains pride both as to his mechanical executions and to his integrity for faithfulness as a man. But very few, if any, of the latter are found among the pieceworkers, who are looked upon as rats by the better classes.

But there is a class who rail out against pieceworkers, who are no better than those whom they decry, men who love to dictate and direct others, yet possess not the essential qualification of ability to guide, the most prominent feature of their make-up being their tongues, which they often use abusively and foolishly and to their own disgrace and disadvantage; as *Æschines* says, "A fellow whose tongue is his sole merit, like a flue, all there is in him, besides, were good for nothing."

Piecework has no other advantages than those mentioned—special benefits to contractors—while to it there are strong objections; for while work done under the system is sometimes fairly executed, it is never as perfect as if done by reliable, day workmen, and generally—seldom otherwise—it is poorly done, with every neglect and slight that is possible instituted so as to escape entire condemnation and re-doing. The pieceworker can have no other incentive than to make the most out of his bargain. His whole interest centers in putting through as much work as possible to augment financial results. To him, pride and satisfaction in the quality of the work cut no figure. When completed and paid for, his interest ceases, and he goes abroad to seek another chance to displace his superiors as workmen, by negotiating them out of employment as day laboring mechanics.

The Price of Labor in New South Wales.

IN the last number of the *English Engineer* is a paragraph giving the prices (in English currency) paid to various grades of mechanics in the colony of New South Wales. We have changed it into American currency, that a comparison can be made with prices that are current in the United States:—

WAGES PER DAY OF TEN HOURS.

Machine men in filing shops from.....	\$2.00 to \$2.80
Iron turners.....	3 53
Engine fitters.....	3 42
General fitters.....	2 32
Brass finishers.....	3 00
Iron moulders.....	3 23
Brass moulders.....	3 00
Pattern makers.....	3 00
Boiler makers.....	3 23
Coppersmiths.....	3 00
Blacksmiths.....	3 63
Blacksmith strikers.....	2 00

As a considerable, in fact the greater, portion of the manufactured

iron used in the colony is imported, persons desirous of obtaining employment in iron manufactories should be extremely careful in going to that country, the number of such establishments in New South Wales being limited. Handy mechanics, willing to make themselves useful, readily find employment, either in town or country, and generally do well.—*American Engineer.*

On Stair Railing.

EDITOR CALIFORNIA ARCHITECT:

Notwithstanding the many treatises written by able authors on stair-building, from the period when the celebrated Peter Nicholson stood confessedly the master concealer and delineator of the science of stair-building, down to the present day, there seems to have prevailed among the workmen in carpentry, a distrust in their ability to handle the many intricacies involved in stair railing, even over the commonest cylinder. This distrust exists even among the best and most competent workmen, and the great intimidating feature is railing work.

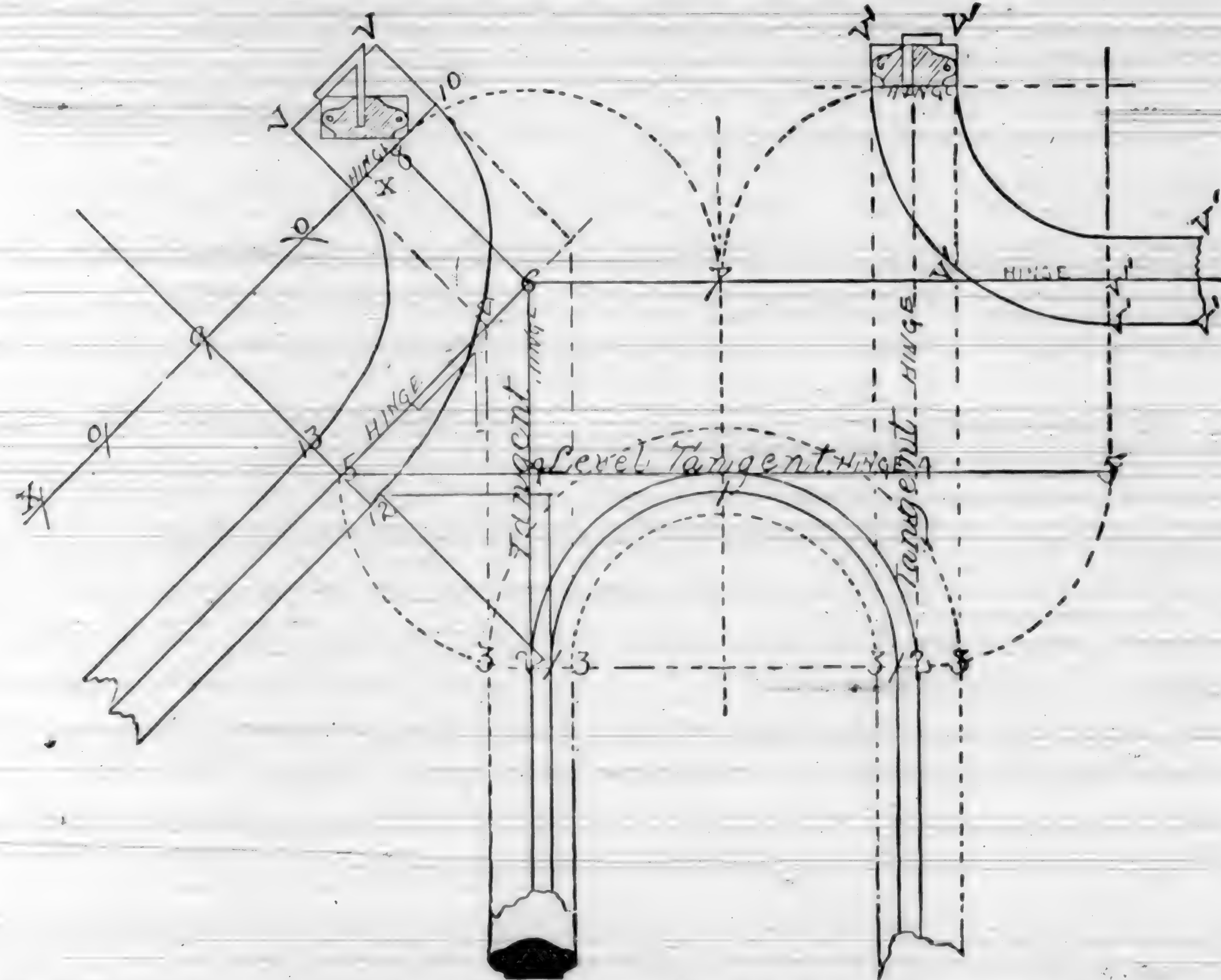
A thorough knowledge of the art of constructive joinery is imperative to perfect workmanship, with skillful and faultless

and cut, locking the respective steps together, so as to provide a continuous strength to the entire construction.

The following diagram shows a very easy way of getting out stair rails over cylinders, 1 1 1 being the face of cylinder, 2 the center of baluster from which the tangents must be derived, and is, in fact, one of the most important points in the ground plan, for the reason that the rail is supported all around the cylinder on the top and center of the balusters.

Commence by making the tangent as shown; place half of the rail each side of 2 3 3; draw level tangent right and left indifferently; take the compass, stand on left, describe a curve from the spring line at 2; to cut level tangent at 5; do the same on opposite side.

The tangents being unfolded, set up the highest—say from 4 to 6 on the left; connect 6 and 5, which will give the tangent in the pitch; square out from 6 to 8, and stand compass in 6; open to 7, the center of cylinder; draw curve, cutting at 8; continue line 8 to 9, parallel with pitch 6 5; 8 9 then becomes the plane of the elliptic curve covering the pitch. The breadth of rail in pitch is next to be found, as shown by the illustration, carried up from 3 8, cutting pitch line.



stair work as the highest point of attainment in building sciences, a full and perfect understanding of which involves the necessity of a thousand lines and points of material value not required in carpentry or general construction.

The proper construction of stairs is an all-important part of house building to both architects and owners, as their daily and hourly use affords comfort and ease, or tires and distresses, as the case may be, according to the accuracy with which the true principle of stair-building is observed. Strength and solidity are also important factors, especially in stairs subjected to severe usage in the passage of safes, heavy trunks, and weighty packages, and in cases like that in France, where, by the falling of a stone staircase, the lives of scores of unsuspecting people were destroyed and a large number maimed and crippled for life, as a result of defective construction and the over-confidence of a thousand human beings who risked their lives upon a thing of beauty, which collapsed from overloading.

I think there are not more than three sets of stairs of similar construction to that just alluded to in the United States, the most notable and prominent of which is in the State House, Columbus, Ohio. Such stairs are supposed to be self-supporting, the wide ends of the steps being inserted in the walls of the stairway, and the cylinder ends and intermediate parts lapped

Now to find the pin points to draw the elliptic curve, take the semi of the major axis (or half the length) from 9 to 10, place the compass in 12, and cut the major axis at X X, X X being the pin points for the outside curves.

Take the distance 9 11 in compass, and stand in 13 and cut 0 0 on the major axis, which are the points to draw the inside curves by. The bevels are shown and how applied on the face of the moulds.

The cutting and standing up is explained as follows: Cut on line from 4 to 5 on either side, and from 5 to 13; from 13 to points marked V V V; from V to 6; from 6 to points marked V' V' V' V' V' V'; from V' to 5; hinge on lines so marked and stand in place.

M. J. MARION.

THE *Evening Bulletin* supplement, 10x12½ inches, contains 120 pages, three and four columns each, of delinquencies in the payment of taxes for 1885 in San Francisco, showing that a very large proportion of those assessed have not been prompt in settling their tax indebtedness.

EXPERIMENTS have proved that green oak posts will last longer in the ground than those from the same variety of seasoned timber.

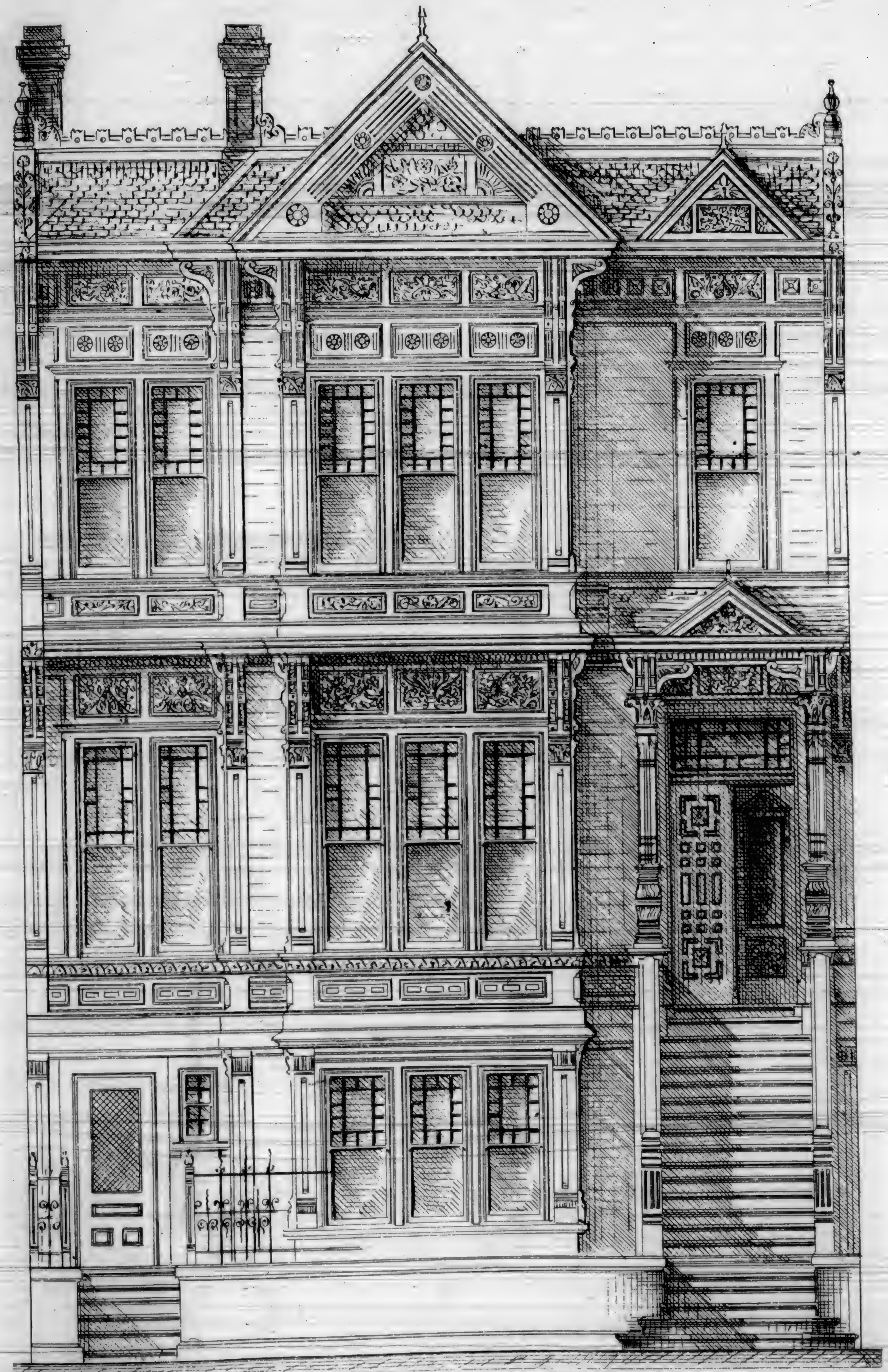


PLATE 1.—FRONT ELEVATION.

The Art of Bricklaying.

There is an art—a mechanical science—in laying bricks. The handling of a trowel in picking up and spreading mortar, and placing bricks in walls, appears to the common observer as a very simple matter, at which any ordinary man should gain proficiency by slight practice. But this is a great mistake. To lay bricks skillfully and as they should be laid, is a mechanical attainment not acquired by some in years of practice. Thousands of bricklayers spend their entire lives in the daily use of the trowel without being able to execute a clean, neat job of masonry. The difference in individual proficiency is great, and from every gang of twenty workmen there may be selected some who stand head and shoulders above others as workmen, and whose easy and skillful handling of the trowel, and grace of motion points them out as the far better men. Such men, with the same or less expenditure of effort and labor, do as much or more than their inferiors as to quantity, and do it infinitely better. But where large forces are required the impossibility to secure a sufficient number of picked men, compels the employment of others whose services would be dispensed with but for the necessities of the case. The same features hold good as far as the bosses are concerned. It is often the case that men who are unqualified to properly fill the place of journeymen drop out of the ranks of the wage-earners and constitute themselves "masters," by which means they are enabled to conceal their personal mechanical deficiencies, and are a part unwarranted by possessed qualifications.

As the result of all this, and the low prices at which work is too often undertaken, and the further fact that there is so little earnest devotion on the part of many masters to acquire a thorough knowledge of the art beyond the experiences and customs of daily life, there is a vast amount of poor brick-work done; and the real master masons—men worthy the name—are made to endure the hardship imposed by competition with the lesser class, whose knowledge of the art of brick-laying reaches not a whit beyond the extent of their limited practical experiences.

These remarks are warranted by the facts known to exist in all cities, with San Francisco not an exception. The piling up of bricks in walls forming the outlines and shape of buildings is one thing, and the skillful manipulation of materials producing the same result is another. Pertinent to this, one of the technical journals devoted to brick-making gives the following general particulars to be observed in using brick material: 1. To reject all misshapen and unsound bricks. 2. To place the beds of the courses perpendicular, or as nearly perpendicular as possible, to the direction of the pressure they have to bear, and to make the bricks on each course break joints with those of the courses above and below by overlapping to the extent of from one-quarter to one-half the length of a brick. 3. To cleanse the surface of each brick and to wet it thoroughly before laying it, in order that it may not absorb the moisture of the mortar too rapidly. 4. To fill every joint thoroughly with mortar, taking care at the same time that the thickness of mortar shall not exceed about $\frac{1}{4}$ inch. In order to prevent the use of too great a thickness of mortar, it is usual in specifications to prescribe a certain depth which a certain number of bricks shall not exceed. For example, if the bricks are $2\frac{1}{4}$ inches deep, it may be specified that four courses of bricks, when built, shall not measure more than 1 foot in depth, a condition which implies that the average thickness of mortar in the joints shall be $\frac{1}{4}$ inch. 5. To use no bats or pieces of bricks except when absolutely necessary in order to make a "closure"—that is, to finish the end or corner of a wall, or the side of an opening—and even then to use no piece less than half a brick.

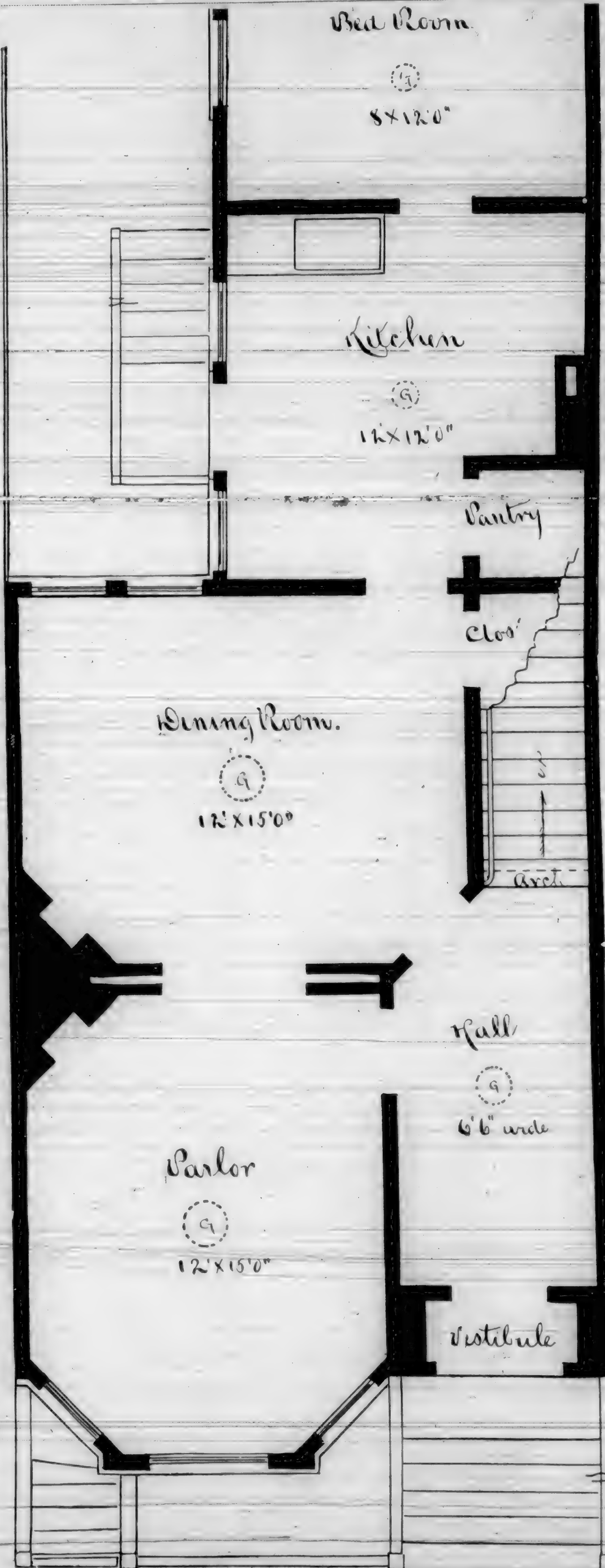


PLATE 2.—FIRST FLOOR PLAN.

A British Mansion.

A LATE issue of the London *World* contains the following interesting description of one of the handsomest and most elaborate mansions in Great Britain: "The rebuilding of Mount Stuart, Lord Bute's place, near Rothesay, has now been completed, and it is one of the most magnificent mansions in Great Britain. The house covers an acre, and is in the mediæval Gothic style of the thirteenth century. The walls, turrets, and balconies are built of stone brought from a quarry in Kirkcudbrightshire. In the center is an immense tower 120 feet high, with a wide balcony all around the top. The great hall is constructed entirely of alabaster and the rarest marbles, with columns and a gallery, and the grand staircase is also of marble brought from Sicily and Carrara. The drawing-rooms are paneled with walnut and beautifully decorated, and so are the dining-rooms, the largest of which accommodates eighty guests. The ceilings and chimney-pieces of all these rooms are most artistic, and so also are the windows, the work of which is extremely elaborate. There are three immense libraries and a billiard-room, all with carved stone fire-places of antique design.

THE estimated copper production of the Lake Superior mines for 1885 gives the following figures: The total production of smelted copper was 71,150,000 pounds, 1,850,000 pounds more than the product of 1884. The Calumet and Hecla produced 47,100,000 pounds in 1885, against 40,473,585 in 1884 and 33,125,155 in 1883. The Quincy Mine product was 5,839,428, or 160,000 pounds more than in 1884. The Franklin comes third and the Atlantic fourth.

THE Northern Railway of Russia is using peat as fuel to a great extent, and saves half the cost of wood or coal by the operation. The peat is found chiefly near Moscow, and is cut mostly by steam machinery, which can penetrate to a depth of twenty feet from the surface of the bog.

THERE are 5,500 sets of telephone instruments connected with the telephone exchanges in the city of New York, besides some 600 private-line instruments. It is estimated that 50,000 conversations take place over the wires of the metropolis every twenty-four hours. For each message there must be at least five "Hellos," which would make 250,000 "Hellos" going over the wires daily in New York.

AN ORIENTAL CANTILEVER BRIDGE.—A letter from Yokohama, Japan, bearing date October 6, gives the following description of an old bridge constructed by native engineers. The writer evidently shared the popular, but erroneous, impression that engineers had urged the claim of novelty in the cantilever principle. The following is the description *verbatim*: "At the sacred city in Nikko, the other day, I was rather amused and interested at seeing a fine and very costly bridge of cantilever construction—abutments of hewn stone, shore piers, hewn granite, octagonal, monolithic, mortised for stone girders; monolithic plate beam to receive wooden superstructure. The stringers are fastened into the abutments, balance over the stone beam, but do not reach, by considerable distance, the gap being fitted by middle stringers let into the shore stringers. The Niagara bridge is a mere amplification of this one, built before America was settled, as a religious duty, very expensive, of thick, red lacquered work, and, like a bridge of angels, its planks are never profaned by the feet of the laity. But it seems queer-like, to come away here to find our new inventions very old."—*Van Nostrand's Magazine*.

NO WOMAN can lace herself so tight as a man can drink himself.

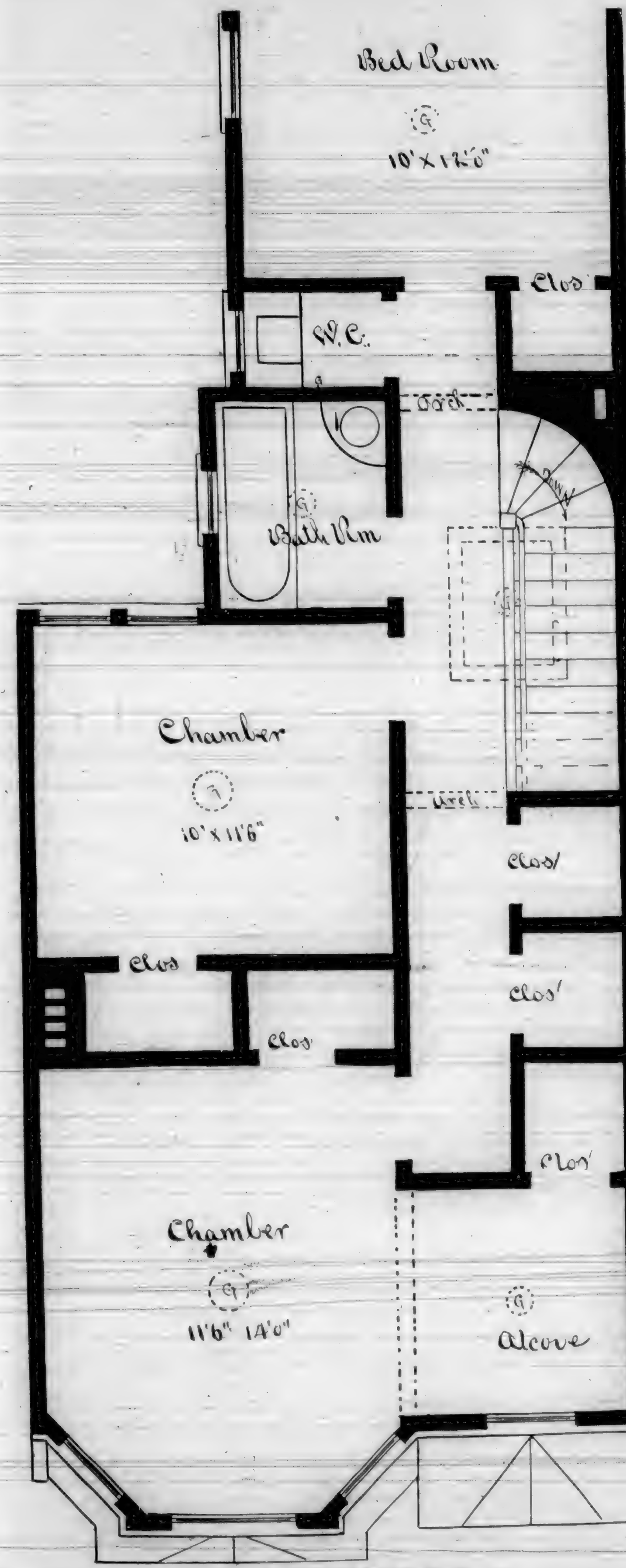


PLATE 3.—SECOND FLOOR PLAN.

Science of Architecture.

(Special for this Journal. By F. HILLERT, Architect and Mechanical Engineer.)
(Continued.)

BY ventilation we understand the renewal of the air in a closet room. This is accomplished by the conveying of fresh air to, and carrying off of the spoiled air from the same, which is either done by voluntary and self-acting ventilation through the permeability of the walls, and its doors and windows, etc., without any separate arrangement, or by special arrangement. Of the latter and its action we will only speak.

The foundation for the calculation of a ventilation arrangement is the finding of the amount of air, for every hour, which has to be admitted, respectively discharged. The air in the room is spoiled by: (1) the respiration and transpiration of men and animals, (2) lighting of the room, (3) smoke and dust, (4) mechanical and chemical processes developing gases. It can be assumed that a grown person, for every hour, breathes out 0.020 cubic meter (0.72 cubic feet) of carbonic acid gas; one burner consuming 0.140 liter = 0.140 cubic meter = 5 feet of gas, burning with a capacity of 7.8 candles, making 0.093 cubic meter (3.32 cubic feet) of carbonic acid gas; good air suitable yet for men to live must not contain more than 0.7 volume per cent of carbonic acid gas. The creation of heat by one person is 130 cal., and by the combustion of 1 cubic meter of gas 8,000 units of heat are produced.

From this information can be calculated, for certain cases, the amount of air which has to be conducted into a room for every hour, to retain the same at a certain temperature, respectively, at a certain state of purity, certainly only under the presumption, in accordance with our present state of knowledge, that, besides the carbonic acid contained in the room, the other exhalations and impurities stand in the same ratio with the respired carbonic acid. This will not be always the case, and, therefore, for different purposes different quantities of air are to be taken into account. The following table furnishes the air quantity for one person for one hour required for different purposes:

CUBIC METER.	CUBIC METER.
Hospitals 70	Common Workshops 60
Surgical Operating Rooms 180, 100	Unhealthy Workshops 100
Halls for Contagious Sickness 150	Concert Halls and Theaters 40, 50
Prisons 50	Meeting Halls 40, 60
House of Correction 20	Schools for Children 15, 20
Baracks (Nights) 40, 50	Grown Persons 30, 35
Stables 180, 200	Evening Schools 35, 40

For rooms to live in, 10, to 20 cubic meters are sufficient for each person, but since the number of them will always vary, or cannot be decided beforehand, we can take, commonly, for an hour's change of air a volume equal to 1 to 2 times the amount of the cubic contents of the respective room. The letting in and taking out of the air, that is, the motion of the air, is always produced by disturbing the equilibrium of two air columns, either by warming respectively, by cooling off of one of them, or by reducing or increasing the pressure of the air column by the forcing in or by driving off of air by machine apparatus. The renewal of air by difference of temperature is named "natural ventilation," the one produced by machine, the "artificial ventilation."

1. VENTILATION BY DIFFERENCE OF TEMPERATURE.

If we connect both ends of a vertical or inclined channel with the atmospheric air, the same will remain at rest as long as the temperature of the same is equal to the atmospheric air temperature. If the air temperature in the channel becomes lower, then, by reason of its larger density, the equilibrium in the channel is disturbed, and the air in it will take a descending motion; but if the air should become of a higher temperature than the atmosphere, the first will be displaced by the latter and an ascending motion is the result. On those physical proceedings depends the ventilation by the difference of temperature.

The simplest arrangement for this system of ventilation consists to give to the room either only one channel for the admission of fresh air, or one for the leading off of the spoiled air; the leading away in the first instance and the admission in the second is done partly by the untightness of the surrounding walls, or by opening of doors and windows at times. This manner of ventilation is not rational, on account of the small and very irregular effect, by the producing of the unavoidable draughts, which, when only one discharging channel exists, is disagreeably felt at the window, and by opening of the door. We find, in execution, this arrangement mostly applied in those instances where, at the commencement of a building, the ventilation was not considered and afterwards introduced, or when unimportant rooms are to be ventilated, and when the above disagreeabilities are of minor importance.

The practical arrangement of a ventilation based on the difference of temperature consists of the entering of the outside air through channels into the rooms to be ventilated, and for conducting away of the spoiled air to above the roof, by protected

channels. As long as the air in the room and in the channels is warmer than the outside air, there is a constant motion of air through the room to above; as long as the air in the rooms and channels is cooler than the atmospheric air outside, a constant settling motion of the latter in the channels and through the room, is going on. The first instance will happen through the winter period of the season; the second, in a limited manner, during the summer-time, that is, as long as the walls are capable they withdraw heat from the room, or if, for single cases, perhaps, regardless of wet, ice or water is applied, to cool and freshen the air in the room. The supply of fresh air can be arranged for the winter season for each room direct from the outside, which is not recommendable, on account of the irregularity of the source of supply by the action of the current of wind. It is best to take the air for many rooms by a common supply channel, whence the same can be branched off and distributed to each room separately.

The supply of air is taken through a channel placed in a sheltered position against dust, rain, and snow, a few meters above ground. Since the wind bears a considerable influence on the measure of ventilation by the pressure of the wind against the column of air in the channel, a densing, or, by suction, a thinning of air is produced, and care should be taken, by the arrangement of the air channel, that the action of the wind pressure should be made useful for ventilation, and the action of the suction be made harmless. It is recommendable to take the air from two different points of the compass, and according to the direction of the wind, the one or the other of the entrances should be used.

The execution of the horizontal air channels must be a careful one, that to the entrance no moisture from the surrounding ground find egress. The cold air taken from the outside should, before getting within reach of persons, be warmed to the temperature of the room. The warming can be done either in each room separately, on the heater placed in the room, or, for many rooms together, by a separate heater. In the last instance arrange as with air heating, the heating apparatus in the basement, and conduct the warmed air by perpendicular pipes to the respective rooms. With the heating of the air in the basement, an increase of the ascending motion of the air is produced, the warmed air becoming lighter than the cool air. This is an important fact, expressly for rooms located in the upper stories.

The warming of the air brings with it a reduction of the relative moisture; it is therefore necessary for all ventilation arrangements to increase the moisture of the air by the evaporation of water. The conducting channels are best placed in the middle and not in the surrounding walls of the building. The discharge from the same into the rooms can be concentrated, placed under the local heater, but better, when possible, when the outlets are distributed in as many places as possible, that the most uniform distribution of the fresh air is obtained. Care must be taken that the admitted air does not become disagreeable to the persons in the room, creating a feeling as if exposed to a draught. The discharging channels, likewise to be located in the middle walls, are to be conducted each by itself to above the roof, and to discharge the air below the roof, and give to the space below the same a corresponding outlet. Or unite the outlets in groups on the floor roof and conduct the air by a common channel to the outside or above the roof. The last arrangement is the best. To empty the air below the roof is not advisable, as in cold climates the snow lodged on the roof will begin to melt, and danger exists to the roof timber when a portion of the moisture contained in the discharged air is condensed, lodging on them and in the space below the roof (attic).

In the rooms itself the opening for discharging air should best be located close to the floor, as also close to the ceiling; the outlet above the floor serves, by normal temperature, to conduct away the heavy air, richly saturated with carbonic acid gas; the outlet under ceiling, by a high temperature, to discharge smoke and the products of combustion from burning gas light, etc. The openings for discharge should be many and in different places. For the calculation of the size of the channels use the formulas therefor given for air heating. With the above described arrangement for ventilation, based on the difference of temperature, it is only required to know and consider the difference of temperature of the rooms to be ventilated and of the outside air.

By heating of the air in the admission or in the discharging channels, the change of the current of air can be increased and hastened. So soon as the air in the admitting channel is heated above the temperature of the air in the room, we obtain in the same time an increased warming and the whole arrangement will be hot air heating, mentioned before. Therefore, there remains only to be considered the ventilation by difference of temperature, where the discharged air is heated. This system of ventilation may be known under the name of aspiration system. The

warming of the air to be drawn off can be done by a gas jet or any other special heating apparatus, either for each channel (discharging) separately, or all in common by being united before. The warming of each discharging channel by itself is, when many rooms are to be ventilated, rarely applied, and mostly only then when for some single

rooms a more powerful ventilation should be desired. In most instances, and for larger establishments, it is better to warm the air to be discharged together. The uniting of the discharging channels of many stories can be arranged in many different ways; either, as before said, the channels are conducted to the attic, and there united to a common channel, or the channels are conducted in the ceiling of each story in a horizontal direction to a common ventilation channel, or the discharging channels are conducted, instead, perpendicularly up, and down to the basement, and then empty together in a horizontal collection channel to be conducted hence by a common ventilation channel to above the roof.

Under the same conditions the first arrangement is, in execution, the simplest, but in effect the most unfavorable; the second is frequently impossible of execution on account of the distribution of the building itself, but in effect the best; the third has the best chance of execution, and its effect ranges between the two former, i. e., when the effect is considered identical with the larger velocity of the air to be obtained. The latter in execution is the most adapted and employed.

The heating of the air with gas is, for large establishments, very expensive, and therefore seldom used. To a fire-place or a central heating in existence, as a rule, the heat of the escaping fire gases is used. For this purpose the chimney is made either of wrought or cast iron, placed in the ventilation channel or shaft, and conducted high above the roof. For the summer season, arrangement for a separate grate fire is made, which conducts its fire gases direct to the smoke stack. When the escaping fire gases of an existing fire cannot be utilized, the arrangement of a smoke stack with a separate fire for warming of the discharged air is, economically, not much more recommendable or preferable than are separate air-heating oven steam heaters or hot water spirals.

The ventilation shaft, as well as the smoke stack, ascending in

the first above the roof, should be supplied at the outlet with an air or smoke suction, and the ventilation shaft, by the use of an iron smoke pipe, should be supplied with irons for ascending for the purpose of controlling the latter.

In the execution of the horizontal collection channels, care is to be taken that all passages of the vertical discharge pipes, as all widening of channels, are made gradually; the execution in general is, besides, the same as those for the channels of air heating.

For the arranging of an "aspiration" system it is required to calculate the actual velocity of the air in the discharging channels correctly, as nearly as possible; therefore the following formulas will serve, applied under the supposition that the air in the channels has a uniform temperature, the channel itself has a quadratic or circular section, and that all changes of direction and section are gradual.

San Francisco Chapter of Architects.

THE regular monthly meeting was held February 5, President Curlett presiding, B. E. Henriksen, secretary. Succeding roll call and approval of minutes of previous meeting, committee reports were next in order. Mr. Sanders regretted the lack of interest on the part of young men, students in the profession, to avail themselves of the opportunities at their command, through the instrumentality of the Chapter. The several classes organized are free to all young men engaged in the offices of members of the Chapter, and it seems strange that even any one student should be indifferent to the advantage possible through the system of class instruction, organized as part of the Chapter work; yet there is a lack of interest manifest on the part of some of those most to be benefited, which speaks less to the credit of the ambition of students than if the desire to utilize every auxiliary to useful improvement was emphasized by punctual and regular attendance at any meeting of the classes.

A communication from the Brotherhood of Carpenters and Joiners of America was read, setting forth the complaint that piecemeal was being permitted on certain buildings under the superintendence of a member of the Chapter. The subject-matter of the complaint being one over which the Chapter could exercise no control, no action was taken.

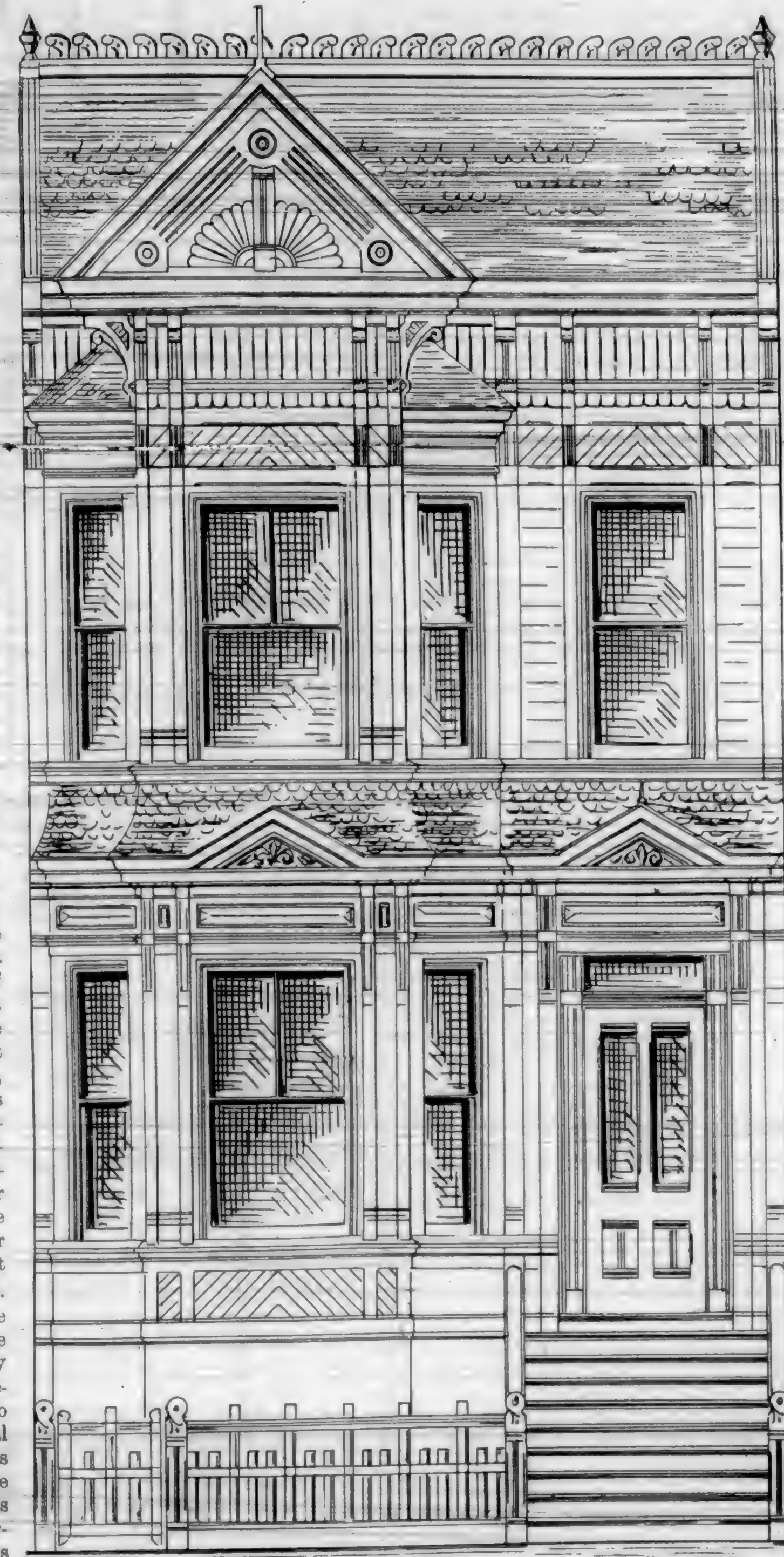


PLATE 4.—FRONT ELEVATION.

The same question was presented to the Chapter some two years or more ago, and received due consideration; and by unanimous vote, the Chapter expressed its disapproval of the system of piecework, but passed no law or rule making it an offense should any member permit departure from regular day labor on constructive works under charge.

The discussion of the sewerage and drainage question was to have been led by Mr. Macy, but that gentleman not being present, the matter was taken up and commented upon generally by the members present. Various suggestions were made as to causes and effects, and some deservedly severe strictures upon the character of construction of street and side sewer work, showing a criminal degree of negligence on the part of those controlling construction, and a weakness, if not dishonest disposition on the part of those who by contract pledge and agree, and are paid to do good work, with good and proper materials, but who substitute inferiority in both workmanship and materials, and consequently construct defective and faulty—instead of what should be, solid, durable and safe—sewers.

The appointment of tailors, shoemakers, beer drinkers, etc.,—men wholly unfit for the position as superintendents of construction,—received rebuke in plain terms.

The meeting was one of great interest. The number present, although not as it should have been—two-thirds of the members of the profession in San Francisco, Oakland, and San Jose—was good, and the proceedings animated and full of interest.

The application of Mr. Seidler, of Sacramento, for membership in the Chapter, was acted upon adversely to the admission of the applicant.

Chicago Soil.

THE *Sanitary News* reports a discussion at the monthly meeting of the Illinois State Architects Association upon the "Bearing Capacity of Chicago Soil," from which it appears that the "bed of blue clay found underneath the layer of loam, and the yielding muck beneath the clay," constitute the formation on which the city of Chicago is built. The clay when dry is "hard and very good for foundations, but when wet it is softened and difficult to treat." "Beds of streams and small rivers run through this stratum of clay," which seem to add to the difficulties of foundation work in certain sections. The fact that this clay is hard and solid when dry, and soft and yielding when wet, renders the study of foundations an important and first essential for architects in planning the erection of buildings in Chicago.

SAN FRANCISCO SOIL

Is much more reliable, as a rule covering all the original layout of the city—the formation being either sand, solid clay, or rock. As a matter of course, the rock-beds must be placed first in the rank of secure formations. Next in order is either the original sand or clay beds, either of which are good, many preferring the sand to the clay. For bearing purposes, when held immovable in position, sand—although in Bible history made to appear as a very treacherous and unreliable under-support for houses—is recognized in this city as safe and sure, unless by wind or water disturbed. The filled-in portions of the city, north, east, and south, will require the solidifying manipulations of centuries to become equal to the original land.

Architects and Draughtmen's Register.

FOR the accommodation and convenience of all parties—practicing architects requiring help, and draughtmen seeking employment—a register is kept in the office of this journal, for the registering of the names of unemployed draughtmen, without any charge, cost, or expense to either party. Draughtmen out of work will do well to enter their names, as orders frequently come to us, "Send us a draughtman." The register is always accessible to architects, and they are at perfect liberty at any time to call and examine list and make selection; or we will, with pleasure, furnish the names of those registered.

THE EFFECT OF ASPHALT ON WORKMEN.—French laborers who work barefooted on asphalt pavements are subject to swelling of the legs, which has been attributed, says *Iron*, to the vaporization, by the heat of the feet, of a small quantity of the petroleum or mineral oil which is contained in the asphalt. The nerves of the feet, which govern muscular action and the contraction of the blood-vessels, form an extensive and very sensitive, nervous network under the arch of the foot, where the skin is always thin, and the nerves are consequently easily affected. In England, workmen on asphalt wear list slippers, and the swelling of the feet has not been noticed.

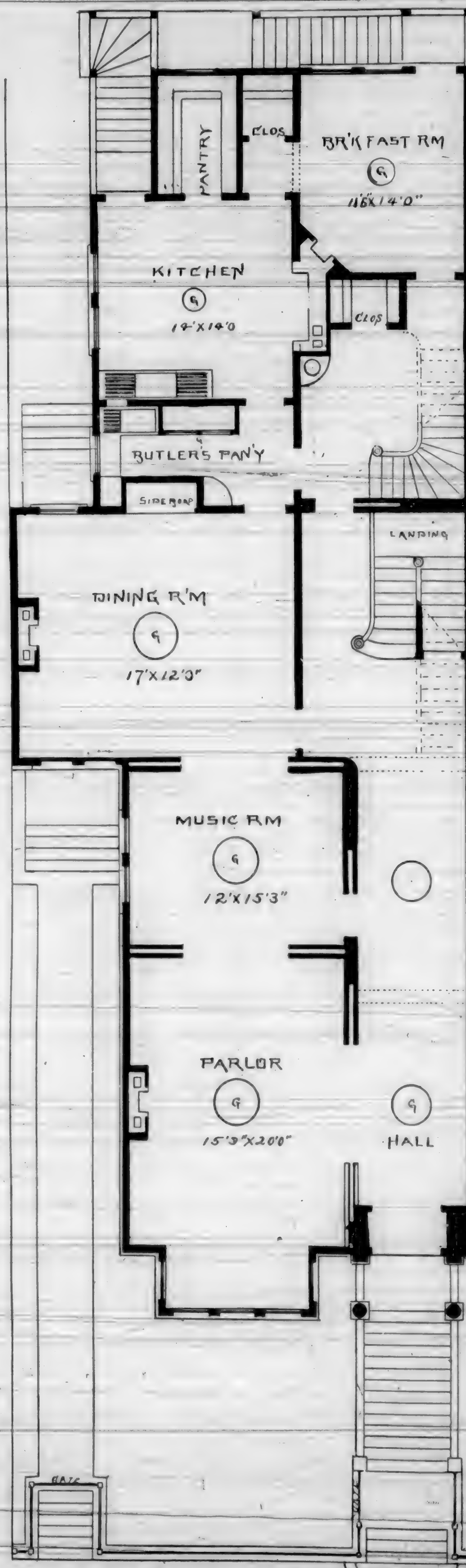


PLATE 5.—FIRST FLOOR PLAN.

California Shingles.

THE shingles used in San Francisco and adjacent counties, and in all counties bordering on the Coast Range, and localities adjacent to the redwood belts, are exclusively sawed redwood shingles; in dimensions, $\frac{3}{4}$ x 14 inches. As in all other things, they vary in quality, with a market standard of No. 1 and 2, the latter consisting of those more or less sappy, and otherwise not sufficiently good to be classed No. 1, except for temporary purposes. The purchase and use of the second quality is decidedly unwise, as the sappy portions of the wood, either in shingles or in contact with the ground or moisture under any circumstances, soon perish and rot.

There is also difference of quality in the No. 1 quality, as some manufacturers turn out much better shingles than some others, with no better stock in the rifts to produce from. Some of the brands run of equal thickness, regular widths, square butts, and full points, while others lack these important characteristics, and are prolific in "swallow tails"—tapering points—and many of these slivered and rendered wholly unfit for full course work, as not more than one-half or two-thirds of the shingles are good in shape and thickness; and if "nigged" in after the custom of the full-fledged shingle layer, early leakages are sure to develop. For while 16 inches long is the supposed length, and 14 inches or less the actual average measurement, and $4\frac{1}{2}$ inches the rule for weather exposure, then where the slivered and short pointed shingles occur, there cannot be full more than one lap or covering, which is not sufficient, except for sun-shade roofs, as a crack occurring in an upper shingle, over an under joint, or a corresponding split in the lower course, would inevitably open an inlet for the waters of every shower or storm during rainy spells.

In redwood trees, as in all other timber growth, there is difference in the grain of the wood, some being "nice," "first-class," others softer, and some hard and brash. The latter is the more objectionable in redwood shingles; those made of this kind of wood are liable to warp, and more apt to split from natural causes, or by the pressure of the foot in walking over them; although in the matter of wear and tear by the action of time and the elements, they are the more durable, as the moisture does not so readily enter the pores, and decay is the longer resisted.

As to durability, redwood shingles certainly have a fair claim, as, although the average thickness of the butt is less than $\frac{3}{4}$ inch, there are roofs now in use in this city which were put on twenty years or more ago, and are still rain tight, with no care looking to their preservation; while others put on more than a quarter of a century since, receiving occasional coats of paint, are in perfect condition, and are likely to remain so for a decade longer, if not for a period of fifty years, provided they receive the attention in paint which should be bestowed on all shingle roofs; for while paint preserves and protects the wood from the action of the elements, it also prevents the accumulation and growth of the greenish, semi-vegetable formations which invariably gather on the shaded, moist sides and sections of roofs in California.

Values and Equivalents.

EQUIVALENTS, as a rule, are regulated by real and actual values, demand and supply being easy, with neither excessive or unduly stimulating. This rule of valuation applies with equal force to everything exchanged or exchangeable for money, whether of material, physical, or mental character. The personal, manual toil and service of those who work and strive through the years of life, with scarce a rational aspiration above and beyond the trammels of conditions in which by birth and inheritance they were placed, alike with the mind and mental labors of those who traverse the innumerable gradations of intellectual pursuits, as well as houses, lands, goods, merchandise, gems, jewels and everything namable, comes under the rule, with special advantage to those only who hold superior and commanding positions or exceptional qualifications.

Quality, as a matter of course, is always a material factor, unless stress of necessities compels the acceptance of the inferior for the better at any cost. Force of circumstances frequently compels submission to unfair exactions and hardships, and very acute corners are made in things of value, when the demand is in excess of supplies, or supply preponderates and overflows the market.

All this will be readily accepted as true, as far as goods and merchandise and all material things are concerned, but it is also equally applicable to mechanical, physical, intellectual and mental values; for these, too, in the innumerable pursuits of life, each in its order possesses value and commands equivalents according to circumstances and prevailing demands, which, if sufficiently active, will consume everything offered, with firmness as to

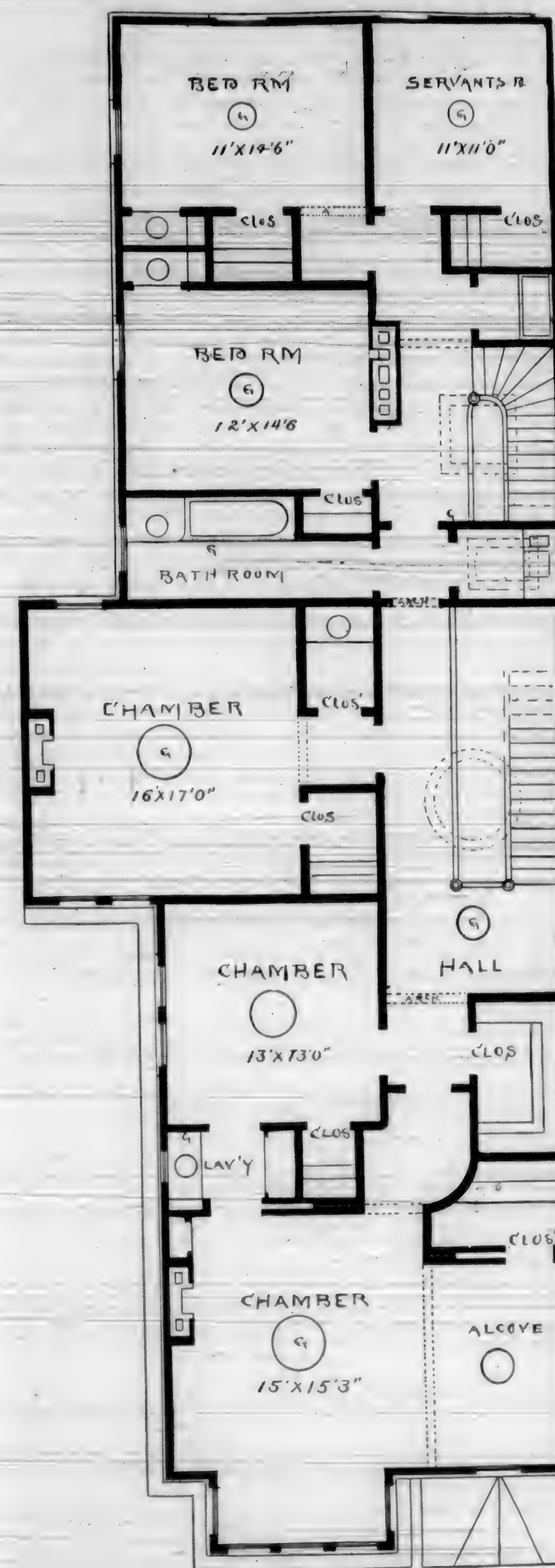


PLATE 6.—SECOND FLOOR PLAN.

CONSIDERABLE trouble is being experienced by the Chartiers Gas Company, of Pittsburg, in laying its pipes along some of the thoroughfares. The gas and water pipes already down are so numerous and close together that the street railway tracks are torn up to make room for putting down the new pipes.

BENJAMIN BAKER, an English authority on bridge building, says Americans are far ahead of the British in bridge building; that America is indeed a paradise of mechanics, and that the practice in this country tends to the production of better bridges than in England.

equivalents, the less desirable finding sale or engagement beyond actual merit value in times of posterity.

Applying this theory to mankind in their endless diversities of pursuits, the rule holds good, labor of body and mind having respective valuations—the better always commanding the higher equivalent, and in cases, the power to dictate terms. Fine abilities seldom “go begging,” especially in professional spheres, and comparatively so in mechanical pursuits. Mechanics, artisans, and even laborers, who by their superior skill and competency and earnest service have reached the position of really first class in their respective lines, deserve the higher equivalent, and receive it above others whose life wants and necessities may be greater, yet, lacking the qualities which exalt their fellows above them, they are forced to submit to, and accept the equivalent for their labor, enforced by circumstances. Hence the importance of every man who is compelled to labor, striving to improve himself, to qualify himself to advance to the highest possibility, and rest not until he joins hand and gains position with those who are deservedly recognized as superior men.

As long as men content themselves with the allotments of life as received from the conditions of birth and early training, and settle down to a “can’t-help-it” state of mind, they cheat and impose upon themselves heavy burdens, and debase not only themselves, but nature—through parental channels often passes down to posterity the physical and mental defects and weaknesses of father or mother, or both. This fact alone should inspire ambitions and create desires for improvement. The incentives are numerous and spread themselves along the pathway of every man, to seek and strive in an honest, right, consistent, legitimate manner to improve himself. Millions of men have lived and passed away, who were truly genuine, human gems of great value, yet from causes have not revealed the luster of their worth, because content to remain in, or unable to remove themselves from the embeddings of early training.

Advancement, improvement—a climbing up among our fellow-men—are necessary adjuncts to human happiness and comfort, and is the grand balance weight that regulates equivalents and values; for the services of men are rated and paid, as a rule, according to clearly manifest merit, with those negligent of opportunities, and indifferent as to possibilities, ever at a disadvantage, and the first to be set aside when services are to be dispensed with.

Difference in Value of Labor.

THE experience of the present and all past times fully confirms the fact that there is a very material difference in the value of individual labor, some doing more and doing it better than others within a given number of hours. This fact creates a disparity in the real value of services rendered, and should regulate compensation. This it does, to the disadvantage of some, in two ways. First, in that men of greater and better mechanical skill and industry secure constant or more constant employment than others who content themselves with operating at lower levels, and working as chance opportunities present themselves, with no laudable aim or ambition for the paths that lead to honor or renown. Second, in that the better classes are always preferred, and are paid better wages. To some extent, and in some cases, this disparity and difference is not to be wondered at, because nature has withheld from some the gifts so generously and bountifully bestowed upon others. Some men might waste a whole life-time in pursuit of certain objects or results, and never attain them, for the reason that unless the physical, mental, and intellectual capacities, powers, and forces are capable and sufficient, all attempts must prove futile. No man can reach beyond the length of his arm. But unless utter submission to circumstances and an unmanly debasement pervade the mind, and the possible refinements of nature are entirely demoralized, there is a chance for improvement. And many who make no right nor earnest effort to improve themselves in directions that would better their condition might do so successfully if they would, by exercising the spirit of mastery over the inclinations that hold them back. Those who do not, because they will not try to do, deserve all the privations and punishments that come upon them. Neither friends nor Dame Fortune will force bread into the mouths of able-bodied men who refuse to help themselves, and reject advantages which they might utilize to their benefit. It may be hard work for some to climb and work their way upward, but better this than to remain all of life's time in the murky slums of non-improvement; for, if not advancing and lifting and gaining ground upward, such is our humanity that it cannot hold its grip at any point and remain stationary; and, if not upward, then downward it must be, and although for a time the effect of retrogression may not be rapid, it is sure, and gains pace as time rolls on, requiring but a few years to work out distressing results and debasements.

Technical Schools.

It is doubtful if with equal expenditure of means, the same amount of effective work can be done for the future manufacturing interests of the country in any other way as can be by the establishing of schools, for which the one established in New York City, by Peter Cooper, may be taken for a model. Not that they should necessarily be of the same magnitude as this; but their aims should be in the same direction. Schools of this kind ought to be so common that every young mechanic could avail himself of their assistance in securing an education, so far as book knowledge goes, in matters relating to the trade he is learning or following. To be sure, all would not do so; but providing means would develop a large amount of latent talent that is now wasted, and the number of those who would be led, from example, to use convenient educational facilities, would increase surprisingly, the result being that manufacturers would reap the benefits of having in their employ a class of workmen bringing to their work intelligence, and a training that fitted them to think of what they were doing. And the more of the thinking, reasoning habit that is centered in any manufacturing business, the better the prospects of success.

Considering the fact, now well understood, that in the future manufacturing will partake more and more, from year to year, of the character of close competition as between different countries, the wisdom of providing every means of increasing knowledge of the subjects connected with it ought to be apparent. In European countries this is very clearly understood, and the matter discussed and helped along in every possible way. Here but little attention is paid to it outside of three or four large cities, and thousands of young men, who are anxious to devote their leisure to study, in the line of their work, find no help in doing so.

Those who have given the subject much attention have almost universally concluded that what is needed is co-ordinate education of the hand and brain. The late Professor Thompson, in his review of the reports of the British commissioners of technical instruction, a review recently made public, shows that in Europe the demand is so largely for men whose training has been, to a great extent, practical, to fill important positions, that there is an excess of men who have a training purely theoretical. He instances Germany, in which it is found that there were a large number of highly trained polytechnic graduates, for whose services there was no demand, while the Austrian Minister of Instruction lamented the inability to reduce the number of theoretical engineers, and to replace them with those who had knowledge of both theory and practice.

If such schools as the Cooper Institute were as common as they should be, this uniting of theory and practice would be the result. We have, in this country, some excellent technical schools, and some of them appear to be fairly successful in uniting theoretical and practical instruction. But no more than the merest fraction of those who ought to have theoretical training are able to take advantage of their facilities. What is wanted is an opportunity for all, so that the best that is in every young mechanic may have an opportunity to develop itself. This is what technical education is coming to in Europe, and is what it must come to here. When this is so, the most important mechanical matters in manufacturing will be in the hands of those best able to manage them in all respects, because every one who has sufficient energy to fill a position of trust, will have secured the necessary theoretical education.—*American Machinist.*

THE *American Architect and Building News* says: “Another old friend, the CALIFORNIA ARCHITECT, is also greatly improved by its new form and style; but we think it's moan that the Pacific Coast—its own preserve—has been deluged by ‘tons of specimen copies’ of Eastern architectural publications, is unworthy of the courage that has brought the journal to its present position, and perceived the benefits that might accrue from the improvements just referred to.” We certainly fail to discover the basis upon which our contemporary reared that doleful word—moan. We merely stated the facts of the case and their extraordinariness, and concluded with the quotation, “He that wrestles with us strengthens our nerve, and sharpens our skill; our opponent is our helper,” adding, “so we consider it, and not only propose to hold our own in the face of this avalanche of interlopers, but to so far excel them in supplying a journal specially adapted to this coast, that their presence will be *eminently immaterial.*” If this language is susceptible of the construction placed upon it by our contemporary, we must admit that we failed to give proper expression to our views of matters; for while the “sample market was flooded” it gave us but little concern, feeling, as we did, well assured in the strong position gained by this journal among the thousands who so eagerly read its contents each month.

You Will Live Just as Long.

“GO SLOW,” “take it easy, and you will live just as long,” is proper advice to over-diligent men, who do more than a fair and reasonable amount of hard work, within the usual prescribed limits of business application, often extending earnest labor into the hours of evening, which should be sacred to restful pleasures or social joys, and to all who are over-anxious, wearing away the vitalities of early manhood, to battle against sometimes imaginary odds, to gain business successes. But its force and application in business relationship cease with these. Men by nature made so, or by education taught to be, slow in every movement, never diligent in anything, never anxious beyond personal comfort and convenience, never intensely earnest in any pursuit, need no such advice.

To wage earners the advice is pernicious, if not in application, dishonest towards employers. The man who employs engages to pay for, and he who hires himself for wages or salary agrees to give, and sells his time and abilities for the price agreed upon, and for the hours per day usual in such cases, or as defined by stipulation, at a certain sum per diem, month or year; consequently every moment of time within such hours, and every right and reasonable service possible in the employed, becomes the property or value of the employer, for which he has paid or is to pay, and any misuse of either is an abuse of the employer's rights. Hence there is no such thing as a wage-earner “going it slow”—*honestly*; of “taking it easy” in the common-sense of the terms, which in effect are simply another manner of expressing the discreditable terms, “loafing” and “loafing,” an idling away and waste of time and services belonging to the employer, and which an employe has no more right to indulge in than in misusing articles of trade. Every yard, package, or pound of goods in store or trade, belongs to employer, and costs him money, and any party found appropriating any portion of them without accounting, would be considered a thief; yet such goods and merchandise no more belong to and cost the owner money, than does the services of employed assistants, clerks, or day laborers; and, viewed in the light of fair—not to say strict—integrity, every hour not put in to the best advantage to the employer, by the employed, is *practical dishonesty*, and, generally, it is of mean and sneaking character, when the willful idler and cheat, conscious of wrong on his part, watches the approach of the employer, and springs to actual or pretended duty at his approach.

Most of those *seemingly* nice maxims and old saws are bad in practice for young men. “Go it while you're young, for when you get old you can't,” has proved the ruin of hundreds of thousands of men and women, who, when too late to counteract, have experienced the folly of their mistakes; and millions of men now walk earth's surface in poverty, or lie in prison cells, or places of public charity, through following out the theory of the maxim quoted; better to reverse the rule, *go slowly, cautiously, savingly*, in the days of youthful vigor, so that the years of age and gray hairs may be full of strength and comfort.

A Substitute for Plaster.

THE ornamental finish of the walls and ceilings of rooms and interiors has attracted the attention of our best artists, and a succession of experiments has produced many different materials to be applied in various ways. In opera houses, theaters, public buildings, and private houses of the best class, the use of plaster has been almost entirely done away with. It was objectionable on account of its weight and liability to crack or become damaged.

Every one knows how quickly a little water will disintegrate plaster material and cause it to loosen its hold, and how frequent are accidents of that kind.

The difficulty and trouble necessary in making repairs were further reasons why a substitute should, if possible, be found. Neither a delicate design, nor objects in high relief can be reproduced in plaster. A new and improved material known as fibrous-stone composition has lately been quite extensively used in the Fifth Avenue Hotel, Wallack's Theater, and the private residences of many wealthy gentlemen, upon ceilings and walls, as well as in the ornamental finish of panels, pilasters, and cornices. It has a fibrous foundation, is extremely hard, and can be cut, sawed, filed, and nailed like wood. There is never any danger of its being displaced by sudden jars, or crumbling and tumbling down.

In case of fire it is incombustible—not lending its aid like lath to the conflagration—merely charring into a black stony sub-

stance. It is as hard as iron and has really the strength of metal without its weight.

The most esteemed value of this material for decorative purposes is the high artistic character of the work. A model in plaster is first made, the excellence of which depends on the talent of the artist. From this original model a faithful and exact fac simile is reproduced, which is sharp, clean, and with the lightness and grace of superior hand-work. It has a close texture, smooth surface, and can be at once put up without the aid of lath and plaster, and is all ready to receive paint, or metallic finish.

Neither heat nor cold will warp or shrink it and no change of atmosphere will affect it, therefore it is applicable for exterior as well as interior finish.

The combination of lightness and strength is a feature of value; great fluted pillars and deep theater cornices are furnished in sectional parts and handled with ease.

Those charmingly developed figures of heroic size, which we have noticed as posing in graceful attitudes above the stage curtain, and those other obliging females who kindly officiate as perpetual candelabra are hardly more weighty than an orphan child. In construction and manipulation, such practical advantages are easily understood. On the other hand, the delicate tracery of a hand-carved picture frame is reproduced with faithful accuracy, and the dainty, high-bred wall ornamentation of the Louis XVI. period is made with absolute exactness of detail and finish.

Comparative Compressive Strength of Granite.

COMPARATIVE tests of the granites of New England and Minnesota, instituted by Professor Winchell, with a view to determining their crushing strength, exhibit some surprising differences. The pieces employed for this purpose were 2-inch cubes unpolished, and crushed between wooden cushions the average strength of 20 specimens of Minnesota granite was found to be 93,272 pounds, or 23,318 pounds per square inch; crushed between steel plates the average strength was 104,800 pounds, or 26,200 pounds to the square inch of surface. The average obtained for the same number of specimens of New England granite was 59,789 pounds, or 14,756 pounds per square inch. The age of Minnesota granites is archaic; that of New England granites is not definitely known.

ONE of the oldest landmarks in New York has been recently destroyed. The building in question was located at 75 and 77 Nassau Street, and dated back to the period when New York was an English colony. It was a two-story brick dwelling when the Old North Dutch Church—afterward the New York Post-office—was built, and perhaps antedates the old Washington Headquarters at the foot of Broadway, on whose site the present Washington Building stands. Three stories were added in 1785, and since then it has passed through all the changes of a century practically unaltered. For some years it has been considered unsafe on account of the shallow foundations, and the owner reluctantly gave orders to have it torn down. As a specimen of the thoroughness and solidity of house-building 100 years ago the half dismantled walls were extremely interesting. The front stood like a face of rock, the thin bricks and cement-like plaster having become welded into a single mass which the workmen broke with strong cold-chisels and even sledge hammers. The bricks used were all imported from Holland, and are about 6½ inches long and 1½ inches thick. The mortar was made of pure shell lime with almost no clay or sand in it, and forms a third of the solid mass. “I have torn down a great many old houses in New York and Albany,” said Edward Sorensen, the contractor, “but I never saw one so well built as this. Why, it's like rock or flint. It will take my men ten times longer to tear down the walls than it would to build new ones. There's no ‘Buddensiek’ about these old Dutch builders. You can't find anything like that front wall now.”—*Carpentry and Building.*

CHANGE IN STYLE OF ARCHITECTURE.—At the Royal Academy exhibition in London, which gives a fair idea of the architectural taste of the time, it will be found that the plain early English style, so popular with architects for many years past in the designs for churches, is giving way to later styles, especially the flamboyant decorated. A curious example of this new departure is shown in the subjects chosen for study by the art students in the Architectural Museum, Westminster. A few years since scarcely any subjects were selected for drawing or modeling but the beautiful foliage of the thirteenth century, whereas now perpendicular details are preferred almost to the exclusion of all others.

ACCORDING to the statements of our versatile Southern correspondent, large areas of lumber lands in the South are being purchased by capitalists, who see that the rapid consumption of lumber, in the United States, must soon make very valuable all wooded lands that are within the reach of railroads or rivers. Every dollar now invested in these untouched timber resources will multiply itself over and over again, within twenty years. This country is of vast extent and the consumption of lumber must increase constantly. The building and maintaining of railroads and the ever-increasing demands of house building, in sections destitute of stone, must swell the consumption so that, in time, prices may be pushed so high as to bring into market supplies of lumber not counted at all now because of their remoteness from consuming centers. When these investments realize, it will be on a large scale, and some great fortunes will be rolled up as easily in lumber lands as they have been rolled up in lands upon which cities have sprung into existence. It is not altogether desirable, from an economic and philanthropic stand-

The more pronounced in form and color the movable objects of an apartment may be, the more pronounced may be their background; and where they are designed and arranged with special regard to luxury and splendor, the background may be worked up to high effects of general tone, and in some instances even its details may be tolerably assertive without losing that character of subordination which is, or should be, a desideratum.

Pine, Rough	per M feet,	\$15 00
" No. 2	" "	12 00
" 2 in lengths	" "	13 00
" 40 to 50 feet lengths	" "	17 00
" 50 " 60 "	" "	18 00
" Selected	" "	20 00
" Clear	" "	25 00
" Fire Wood	" "	8 00
T. & G. Flooring, 1 x 6	" "	27 00
" 1 1/2 x 6, 1 x 4, 1 1/2 x 4, 1 1/2 x 3, } " 1 x 3, and narrower } " No. 2	" "	30 00
Stepping	" "	22 00
" No. 2	" "	35 00
Furring, 1 x 2	per lineal foot,	27 50
Redwood, Rough	per M feet,	18 00
" No. 2	" "	14 00
" Surfaced	" "	30 00
" T. & G. 6 in. 12 ft. and over	" "	23 00
" " 7 to 11 feet	" "	25 00
" " under 7 feet	" "	20 00
" Rustic	" "	30 00
" No. 2	" "	26 00
" T. & G. Beaded, 12 ft. and over	" "	30 00
" " 7 to 11 ft	" "	25 00
" " under 7 ft	" "	20 00
" Siding, 1/2 inch	" "	22 50
Pickets, Fancy	per M,	25 00
" Rough Pointed,	" "	16 00
" Square	" "	14 00
Battens, 1/2 x 3	per lineal foot,	00 3/4
Shingles	per M,	2 00
Laths, 1 1/2	" "	3 25
" 1 1/4	" "	3 75
NAILS—Rates were recently reduced to:—		
200 keg lots		3 15
100 keg lots		3 20
Smaller quantities		3 25
PAINTS AND OILS:		
Pioneer White Lead (local factory)		45
Cal. Linseed Oil, raw (single bbl lots)	6 1/2 @ 6 1/2	47 1/2
" boiled		58
Turpentine, per gallon		5 50
BRICK—California Building Description, soft, per 1,000		6 50
" red,		7 50
" hard,		7 00

47

California, cor. Octavia. Two-story
frame stable.
O.—M. Rosenbaum.
A.—W. Moosier.

one-story frame stores.
O. and B. - W. M. Fletcher.
Day work.
\$3,500.

O.—Macondary estate.
A.—W. F. Smith.
C.—C. L. Tilden.
\$5,000.

Seventeenth, cor. Noe. Two-story frame. O. H. Bohmder. A. H. Gellfuss. C. W. J. Brownrigg. \$5,000.

Seventeenth, bet. Page and Oak. One and one-half-story frame. O. G. H. Luchinger. A. H. Gellfuss. C. A. Miller. \$2,000.

Second, bet. Brauman and Townsend. Four two-story frames. O. E. Foster. A. C. T. Havens. C. F. W. Kern. \$5,050.

Stockton, bet. Post and Sutter. Five-story brick and basement. O. Levi Strauss. A. P. R. Schmidt. C. R. McCann. \$25,000.

Sacramento, bet. Larkin and Polk. Two two-story frames. O. J. W. Davis. A. P. R. Schmidt. C. R. McCann. \$10,000.

Second, bet. Mission and Howard. Two-story frame. O. Isaac Ruldee. A. Jas. E. Wolfe. C. H. Keenan. \$3,100.

Thirtieth, nr. Noe. Italian Hospital repairs. O. Tibbenda Bank. A. Hueme & Everett. C. F. Buckley. \$830.

Twelfth, bet. Folson and Harrison. Repairs. O. P. Lahaney. A. M. J. Welch. C. R. Sinnott. \$1,600.

Trent Ave., bet. Twenty-fourth and Twenty-fifth. One-story frame. O. and B. John McCarthy. Day work. \$1,300.

Trent Ave., bet. Twenty-fifth and Twenty-sixth. Two-story frame. O. J. Walton. C. J. S. Tibbels. \$4,500.

Trent Ave., bet. Twenty-fifth and Twenty-sixth. Two-story frame. O. and B. Joseph Sims. Day work. \$2,400.

Twentieth, cor. Capp. Two-story frame. O. H. Walton. C. N. W. Stecker. \$2,000.

Twenty-first, cor. Capp. frame church. O. Grace Methodist Episcopal Church. A. C. Giddes. C. R. S. Miller. \$35,000.

Valencia, nr. Eighteenth. Two-story frame. O. A. Dibble. A. S. & J. C. Newsom. C. D. B. Spangler. \$6,500.

Valley, nr. Dolores. One-story frame. O. and B. M. Loftus. Day work. \$1,200.

Valley, above Dolores. One-story frame. O. and B. R. Bergfeld. Day work. \$1,400.

Valencia, bet. Eighteenth and Nineteenth. Two-story frame. O. H. Mau. A. Jas. E. Wolfe. C. Herman & Wilson. \$4,650.

Van Ness Ave., bet. Geary and Post. Alterations. O. Woman's Relief Society. A. Curlett & Cuthbertson. C. J. Wilcox. \$2,000.

MISCELLANEOUS.

San Jose—Santa Clara. Alterations. O. Hatman & Normandine. A. Jacob Lenzen & Son. G. W. Boyles. \$700. Chapman & Davis Tract. One-story frame. O. E. O. Melcher. A. Jacob Lenzen & Son. G. W. Boyles & Crawford. \$2,500. Eighteen-Mile House. One-story frame. O. Morgan Hill. A. Jacob Lenzen & Son. C. H. C. Skow. \$3,055.

Sacramento—Thirtieth, cor. J. Two-story and basement brick. O. Dr. E. Jacobs. A. N. D. Goodell. C. Carle & Croly. \$5,727.

Richland—Two-story frame and brick basement. O. Senator Wm. Johnston. A. N. D. Goodell. C. Thos. McCaffrey. \$3,500.

Merced—Eighteenth. One-story frame. O. A. Rosso. C. F. F. & DeWitt. \$900. Seventeenth. One-story frame. O. Mrs. Edwards. C. A. M. Wellman. \$

Sau Rafael—Additions and alterations. O. J. M. Donahue. A. T. J. Welch. C. I. Sharer. \$7,000.

Centerville—Frame church. O. P. W. Riordan. A. T. J. Welch. C. A. McElroy. \$3,000.

OAKLAND.

Twenty-fourth, cor. Elm—1-story fr.; O. H. Well. A. H. Gellfuss. C. Geo. Lang. \$4,500.

Twenty-fourth, bet. Grove and Telegraph ave.—1-story fr.; O. W. C. Hall. A. J. & T. D. Newsom. C. G. W. Palmer. \$2,500.

Twenty-fourth, bet. Grove and Telegraph ave.—1-story fr.; O. W. C. McDonald. A. J. & T. D. Newsom. Day work. \$3,000.

ALAMEDA.

1-story fr. etc.; O. S. E. Knowles. A. C. I. Havens. C. Geo. A. Benseman. \$5,500.

Either of the Books mentioned below, and the California Architect for 1886, will be sent to any address upon receipt of price mentioned California Architect and Building News, \$2.00 per Year WITH

Science of Carpentry	\$5.50
Plaster, How to Make It	2.50
How to File Saws	2.50
Modern Perspective	2.50
Practical Geometry	2.25
Carpenter's Pocket Book	2.25
Church Architecture	5.25
Practical Carpentry	2.50
Artisan	6.00
Architect's Companion	4.25
Building Superintendence	4.25
Hand Railing	3.00
DRAWING FOR	
Carpenters and Joiners	3.25
Bricklayers	3.00
Cabinet Makers	3.00
Stonemasons	3.00
Cutting Tools	3.00
Carpenter and Joiner	8.50
Cumming's Details	7.00
Palliser's Details	3.25
Painter's Foreman	3.00
Universal Assistant	3.75
House Plans	3.50
Mechanic's Geometry	6.00
Gould's Carpentry	4.00
Hand Book of Legendary and Mythological Art	4.00
Mechanical Drawing Self-Taught	5.00
Suburban Cottages	2.50
Street, Store, and Bank Fronts	3.50
Dwellings for Village and Country	4.00
Hand-railing and Stair-casing	2.50
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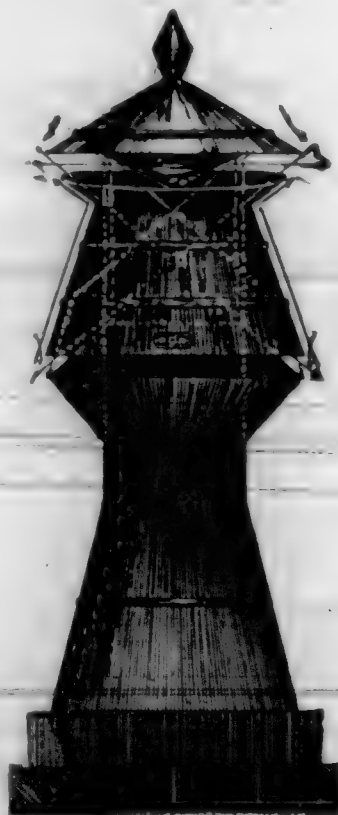
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Much time and money have been spent in perfecting the Statuettes, and they are much improved over the first sent out. The Committee have received from subscribers many letters of commendation.

The New York World Fund of \$100,000 completes the Pedestal, but it is estimated that \$40,000 is yet needed to pay for the iron fastenings and the erection of the Statue.

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THE CALIFORNIA ARCHITECT AND BUILDING NEWS.

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Subscribers will please notify us promptly of any failure to receive this journal, and also of any change in their address.

Advertisements inserted at reasonable rates.

SAN FRANCISCO, CAL., APRIL 10, 1886.

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"High Building"—Law of New York.

BUILDING, in its issue of March 20, refers to the introduction of a bill in the New York Legislature to repeal the "high building" law, passed by the law-making body and signed by the Governor last summer, which restricted the height of tenement buildings to seventy feet on streets of sixty feet or less in width.

The passage of the restrictive law was received with favor and approval, except by speculative parties who would not only—if possible—penetrate the lofty clouds with piles of brick and mortar, but dig as deep in the opposite direction, for sordid gain, without a single regard for human life, health, or comfort.

There is but a single reasonable and right argument favoring excessive heights of tenement structures, to wit: positive insufficiency of space of territory to supply the required number of shelters for the inhabitants, and even in this and every other regard they are objectionable, as they shut out some light, and cast gloomy shadows, and provide darkened and gloomy apartments, which possess none of the elements of cheerful life. "They are so regarded *per se* and in their relation to adjoining property."

"In view of the fact that in every civilized country there is some law fixing the proportion between the height of a dwelling and the width of the street on which it adjoins, the city of New York acted wisely in having such law passed last year. It would be a serious step backward to repeal now this beneficent law. It should, by all means, be supported."

Change of Date of Issue.

WITH the January issue of this journal, the date was fixed at the 5th of each month. This, however, does not work well, and we are compelled to change date of publication to the 10th. The reason for this is, that reports of meetings held in the first week of the month often come to hand too late for insertion until the following month. Consequently, for the purpose of accommodating all interests, the tenth day of each month will hereafter be the date of issue.

All communications should be handed in as near the first as possible, and reports not later than the sixth of each month.

Summary of Building Activities.

OUR present monthly report shows an apparent decrease in building operations, over the same month's report for 1885; but scarcely so in real fact, as several commencements are not included this month, for the reason that only portions of the work has as yet passed to contract. With these added, the amount for April, 1886, would fully equal that of 1885.

The grading, brick work, cast iron work, wrought iron work, and carpenter work of the J. C. Flood's building, corner Market and Fourth Streets, have been let respectively, in the order named, to A. C. Buckman, Butler & McGowan, Reese Llewellyn, Sims & Morris, and C. C. Terrell. The total of these and the remaining branches will appear in future issues.

Additional contracts on the Nightingale building, to the amount of \$31,035, have been let, but these do not include entire cost.

"Davis Bros." building is in progress, and will be an expensive building; but, as yet, the contracts awarded amount only to \$19,500.

The activities in residence and tenement improvements are large, and the prospective outlook is of the most encouraging character. The report for April sums as follows:—

152 frames, value	\$675,206
6 bricks	51,000
24 alterations and improvements	112,310

182 Total for current month, \$838,516

For same period in 1885: Total engagements, 168; total value, \$1,131,450, showing for April of present year, 14 commencements more than in 1885, with \$292,934 investment in favor of the preceding year. But, as we have stated, were the cost of the buildings commenced, and not included in present report, added, the balance would be in favor of 1886.

Delaying reports of contract amounts for portions of the work on buildings, until all the branches are let, is preferred by most architects and owners, and is more a matter of interest than importance to outsiders. We do so in many cases by special request, not failing, however, to wind up our annual report with the full sum of expenditures, as nearly and correctly as possible.

HYDRAULIC-LIME CONCRETE.—A kind of concrete, hard and solid, is now being used for building purposes in Paris. It is composed of eight parts of sand, gravel and pebbles; one part of common earth, burnt and powdered; one part powdered cinders, and one and a half parts unslacked hydraulic lime. These materials are thoroughly beaten up together, their mixture giving a concrete which sets almost immediately, and becomes in a few days extremely hard and solid, which property may be still further increased by the addition of a small quantity, say one part, of cement. Among other constructions to which this material has been applied, is a house three stories in height, sixty-five by forty-five feet, standing on a terrace, having a perpendicular retaining wall 200 feet in length and 20 feet high. Every part of this structure was made of the hard concrete, including foundations, vaults of cellars, retaining walls and all walls, exterior and interior, as well as the cornice work, mouldings, string-courses, balustrades, parapets; and the building is without band-iron, lintels or wood throughout. —Exchange.

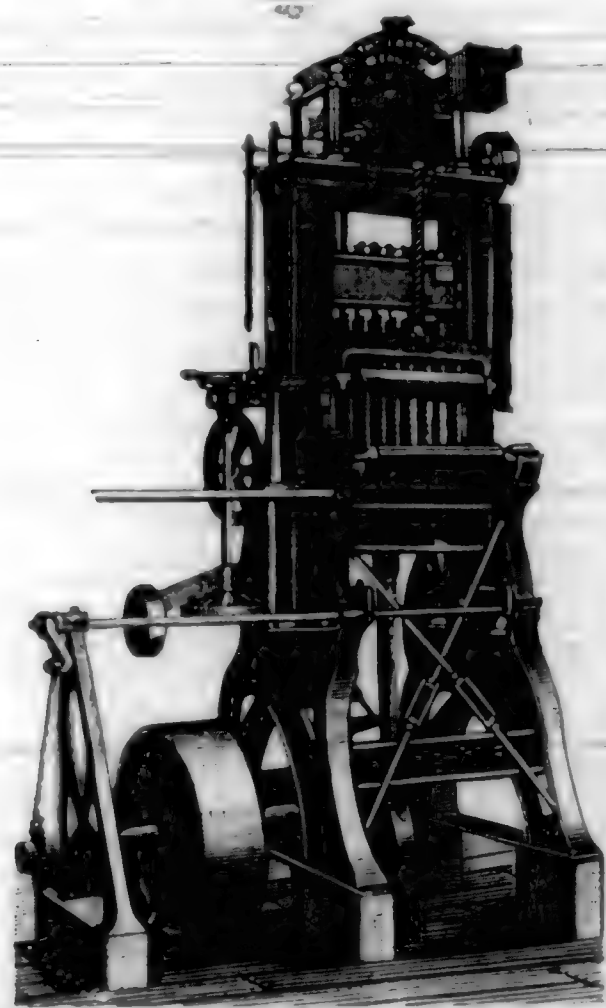
THE EXPLORATIONS AT DELOS.—In the *Revue Critique*, M. Homolle gives an account of the results of the new explorations carried on at Delos. The remains of a medieval city have been laid bare, and the discoveries in the field of classical archaeology, though not so sensational as those of the previous enterprises, are still full of interest for the history of the "island schools." Fifty fragments of marble sculpture have been found, besides terra cotta and small bronzes. To these have to be added 224 fragments of inscriptions, some dating as early as the fifth century B. C.—none later than the first century B. C. They contain funeral inscriptions, dedications, decrees, and choragic lists. One of them is 600 lines long, and the whole, when edited, are sure to throw much light on the politics and commerce of the Cyclades.

Something New in the Manufacture of Lumber.

EVERY perfected improvement in machinery, systems, or methods calculated more fully to develop and enlarge the manufacturing and producing interests and resources of the Pacific Coast, becomes a matter of general, as well as specific and individual interest. The permanent prosperity of this State depends largely upon the practical developments in the mechanical and producing arts and sciences, with the growth, expansion, and enlargement of which, sufficient to meet and supply the daily, re-occurring necessities and demands of the times, assurance and confidence is strengthened, that California and its sister Pacific States and Territories are, in themselves, equal to any emergency that may arise, with surplus for other markets. A people possessing the intelligence, practical capacities, energies and availabilities to produce and supply every home and local want from natural resources within their own boundaries, must ever be self-reliant, progressive, and aggressive in everything that promises personal and community comfort, happiness, and wealth.

A SPLENDID SAW-MILL OUTFIT—NEW DEVICE.

In this connection we present a cut and short description of a new saw-mill enterprise which should, from the standpoint outlined above, be a matter of interest far beyond the circle of those directly connected financially, for two special reasons: 1. Because in and of itself, the mill, with its numerous appurtenances and appliances, is a most complete and perfect mechanical conception, unequalled by anything of its kind in use upon this coast in the manufacture of lumber. 2. The mechanical construction of the mill is entirely Californian, or, more properly speaking, San Franciscan—the first of its kind ever manufactured on this coast, and another illustration of the capacity, proficiency and skill that has placed the Union Iron Works of this city in the fore ranks, if not fully equal to the oldest and best in the United States in the production of massive as well as intricately fine machinery.



This piece, or combination of machinery is claimed to be the largest of its kind in use in the manufacture of lumber—at least west of the Rocky Mountains. It is what is known as a "gang," but differing materially from the old, ordinary gang-saw device. It is a steel sash, or frame, 44 inches in width, with 32 saws in the frame, driven vertically by steam power. The arrangement is such that the frames and saws oscillate, so as to produce a motion similar to the old-fashioned whip saw. The vertical motion of the saws is 200 per minute, which, multiplied by the distance traveled each motion, 2 feet = 400 feet to each blade ÷ 32 blades = 12,500 feet of cut each minute.

ute by the gang, producing each day of 10 hours, 50,000 feet of lumber, with the twofold advantage of economy in the log material, resultant from the saving produced by the use of thin-bladed saws, and the sawing of lumber absolutely true, straight, and square. The mill was designed by Mr. F. S. Farmer, who is acknowledged to have no superiors in practical saw-mill engineering on this coast, and who has built some of the finest mills known to the trade.

Mr. Irwin M. Scott, manager of the Union Iron Works, was so favorably impressed and well pleased with the drawings prepared by Mr. Farmer, that he applied, and, as will be seen by examination of the cut, placed on the head frontis-plate the name, Farmer Gang.

Some idea of the magnitude of the mill may be comprehended by the fact that the construction shown by the cut weighs 62,000 pounds, 31 tons, and cost about \$10,000. It is now being placed in position by its designer, at the extensive mill-site of the Western Mill and Lumber Co., Port Hadlock, Puget Sound, Washington Territory. The office of the Company is at 840 Fourth Street, San Francisco, Turner, Kennedy & Shaw, agents. It may be further stated that the other appointments of the mill consist in part, of ten heavy steel boilers, two large engines, 28x36-inch cylinders, gang edgers, live rolls, yankee fireman, slab and sawdust conveyors, bull wheels, and all other appurtenances required in a first-class lumber saw-mill.

"Reciprocal relief,"—"home manufacture,"—is well exemplified in this connection, as the whole of this splendid machinery and outfit are the product of a San Francisco machine shop and foundry, which must be admitted as a creditable witness to the fact that there is no right or reasonable excuse on the part of any one going abroad to obtain that which can be as well or better produced among ourselves, as from quarters and parties in other sections of the country, whose only special sympathy in the interests of this city, State, and coast, is to secure contract and trade advantages, and bear away not only the profits on engagements, but the full sum of cost of raw material and labor as well. In this regard, the promoters and owners of the enterprise under notice deserve all praise; for while a financial preference was given to the San Francisco firm, they did not err in doing so, as they have in return, machinery that could not be bettered anywhere in completeness and quality of workmanship, and the money so expended remains in this city, as bread cast upon the waters, to return in part at least, in due time. And the proud satisfaction of having a mill unsurpassed, if approached, by any other within the entire scope of the great northwestern timber regions of our great continent, is one that should fully compensate for every sacrifice made in preferring and rewarding home industry, over the questionable and petty economies that might have been practiced in canvassing for a cheaper market to secure a present saving, at the expense of tenfold cost in the future to remedy the imperfections assured and certain to follow, particularly in machinery works, when cheapness is made the controlling factor. The support of "home industries" is the life of every city and State, and those who go abroad for that which can be procured at home, as good in kind and quality, certainly forfeit claim to good citizenship, as far as the best interests of the commonwealth are concerned; for money required to pay for the thing unnecessarily imported, must come from the purses of those who should have enjoyed the benefits and advantages of producing, or manufacturing the thing imported.

It is to be hoped that the example set in this case may prove powerful in argument against the unwise practice, on the part of many, of sending abroad for that which can be had this side of the mountains, without any loss or sacrifice whatever, other than that of subjugating a penurious disposition of mind to the wiser economy of sustaining home industries.

The Acoustics of Churches.

THIS subject is of the greatest importance in connection with a large church suited to modern requirements, but, unhappily, very little is really known concerning it. This, however, is certain, that echo and reverberation are caused by sound being reflected from flat surfaces within confined spaces. In churches these effects mostly result from bald, unbroken wall spaces, bad proportions, piers with flat surfaces, horizontal ceilings, and square-ended transepts, unless the transepts be of such length that the voice, decaying before reaching the end walls, is not strong enough to be unpleasantly reflected. It has been unjustly said that domes are always bad for sound, and St. Paul's is frequently instanced as an example. I maintain that a dome is not necessarily bad for sound, and many Gothic churches have more reverberation and echo than many Italian churches with cupolas. The acoustic qualities depend upon the arrangement. In St. Paul's the dome has certainly very little to do with the acoustic defects, and I quote St. Paul's as a well known example. The reverberation there is caused mainly by the flat surfaces of the piers generally, by the re-entering angles of the large piers at the corner of the octagon respectively, by the slight curve and plain circular face of the pendentives, by the square-ended transepts, and by the large flat surfaces in the aisles. At a certain distance from the re-entering angles of the large piers, at the point where the voice of a preacher is reflected from both surfaces and these reflections meet, not a word can be distinguished; while by moving out of the angle of reflection only one or two seats farther forward, and being then seventy or eighty feet from the speaker, every word can be distinctly heard. This demonstrates the effect of large piers with flat surfaces. St. Augustine's, Hackney, is an instance out of many of the effect of bald wall surface and square-ended transepts. There, when the pulpit was placed near the chancel arch, the reverberation was very great, the voice being reflected by the transepts, which have no arcades or aisles; when, however, the pulpit was moved to the west side of transept into the nave, the preacher could be heard with ease; and other instances of a similar plan give the same result. In other large churches with aisle walls quite plain to a considerable height, the reverberation is always great. Professor Roger Smith, who has given this subject much attention, has evidently arrived at a similar conclusion as to the cause of echo, etc., for he says in his work on practical acoustics, "The forma-

tion of recesses, breaking up end walls, rounding and canting off angles, bringing the ceiling onto the walls with a cove or cant, and breaking it up with groining, are all methods of avoiding the risk of acoustic failure." In plain language, this means that plain surfaces should be avoided. Domes of no great height, on square piers, or over spaces confined by flat walls and without large voids like a nave or transept, into which sound may escape, are undoubtedly bad as far as echo and reverberation are concerned. This is notably shown in the Pantheon at Rome, the reading-room at the British Museum, London, the Picton Reading-room, Liverpool, Napoleon's Tomb, at Paris, the Taj Mahal, at Agra, and numbers of the Italian and Indian domes. In these the voice cannot escape, and is reflected backwards and forwards from the flat surfaces. That a low dome is worse in its acoustic results than a high one is proved by the fact that the reverberation in the first gallery of St. Paul's is much greater than on the floor level, while in the whispering-gallery the echo is extraordinary, as the name denotes. The Picton Reading-room is also a local example of this. In fact, to avoid reflection (i. e., echo and reverberation), sound must be either lost in a void, or absorbed by drapery, or deflected and shattered on the confining surfaces. In the latter case there is practically no reflection from the piers or walls. It is evident, if this can be arranged, that a larger congregation could hear more freely in a great area covered by a lofty dome than in a long and comparatively narrow nave. And this result can be obtained by the shape of the piers, the arrangement of wall surfaces, and the proportions. For a voice to fill a large space accommodating a crowd of two or three thousand people, a sounding-board would always be necessary to throw the voice forward. In the plan submitted* to give practical effect to the principles above stated, all lengthened plain surfaces of wall have been avoided; the dome is of great height, and the nave and transepts form large voids into which sound can escape. The large piers supporting the dome are circular on plan, by which means the direction of sound would simply be changed without reflection. The alternate sides of the octagon have semi-circular recesses behind the arches, broken by galleries, by deeply-recessed windows, and by double tracery. The pendentives are constructed with a great variety of curved surfaces at different angles, and broken by projecting arches and ribs. Above the pendentives two galleries break the height, also a traceried arcade in front of the deeply-splayed windows. The dome itself is of such a height that any reflection of sound taking place, in spite of the arched to the drum and the projecting galleries, would practically be lost, and could not affect either the preacher or the audience. The transepts are as deep as the site will allow, are octagonal on plan, instead of flat, and have recesses at the angles. The aisles are broken by deep recesses formed by bringing the necessary buttresses inside (giving also greater internal effect of width, and supplying space for monuments, and having a constructional advantage with the form of roof adopted by giving better abutment at the foot of the roofing vault to aisles). The surface of the west wall is broken by projecting columns and a gallery (which also affords convenient space for arranging either heavy curtains, mats, or a screen to the west doors). The roofs, too, are groined.—William Emerson, in *British Architect*.

Conglomerate—"Fire Limit Ordinance," Building Law, Etc., in San Francisco.

LAWS and ordinances establishing and empowering "Building Bureaus," "Building Boards," "Boards of Public Works," etc., exist in most of the larger cities of the United States, with special jurisdiction over the erection and construction of buildings, in matters of sufficiency of strength and other details, as regulated by the respective codes of laws and ordinances, which are from time to time changed and amended to fit each newly-developed necessity.

But—singular as it may appear, and is in fact—in the great, prosperous, and progressive city of San Francisco, there is no better building law than the medley of "Fire Limit Ordinances," in which is mixed up all there is in the shape of laws and ordinances regulating the science of architecture and building construction; and to complete the irregularity, the interpretation, application, and enforcement of the ordinance is placed wholly within the control of the chief of the fire department, his deputies and assistants, and those within the fire department circle. To all of which, there are many reasonable and valid objections.

The construction of buildings, in an architectural and mechanical sense, is an important special science in and of itself, requiring mechanical and professional skill and experience to rightly understand, apply, and demonstrate its numerous problems.

*Reference to which was made in *Building* for March 13, in the description of the design submitted for the Liverpool Cathedral.

This being so, it should be under the control of those properly qualified by individual education and practical experiences to manage and direct matters.

On the other hand, the science of combating the devouring elements is one of special character, requiring special physical and mental qualifications,—courage, strength, agility, daring, correct judgment, etc.; but men may become splendid firemen, as chiefs and subordinates, braving terrible dangers and performing acts of heroism, who, in other spheres, would amount to but little, and who, if called upon to decide issues in, or direct constructive building operations from, *personal knowledge and understanding*, would be altogether incompetent.

In the fire department sphere, the great and all-absorbing thought runs in the fire channel, and the thoughts and dictations of wardens, chief, deputies, and men are pre-eminently for fire department interests, and every other consideration is made to bend and yield to the notions and ideas incubated and vitalized under the influence of the fire department.

The two sciences, therefore, being distinctive in character, requirements, purposes, etc., should be provided with governments, managements, and dictations specially adapted to each; all matters involved in or pertaining to the control of the department,—conflagrations, storage of dangerous explosives, and the innumerable details of the special department work,—remaining with the fire wardens, chief, and their auxiliaries; and that which pertains to building construction to be placed under the control of a "Building Board," "Building Bureau," or any other form of authority composed of intelligent and competent men, familiar with the numberless involvements in building construction.

The ordinances at present affecting building construction are certainly not by any means explicit, sufficient, or consistent, and many of the provisions are daily disregarded by both architects and builders; and, being so thoroughly impracticable, their violations are permitted to pass unnoticed, even by the watchful guardians who sometimes insist upon the rigid observance of immaterial things, which are enforced because the ordinance says so and so, although, practically, for any good purpose, the same may be entirely useless and unnecessary.

These suggestions are made in all candor, without intent to antagonize or offend in any direction. The division proposed is in harmony with the results of experience in other cities, where building laws, special to constructive works, are considered to be of vast importance, and receive great attention. There is no good reason why an efficient Building Board should not be established in San Francisco. The columns of this journal are free to any one entertaining adverse views upon the subject matter introduced in this article, as well as those in harmony therewith. An intelligent discussion of the issue might prove interesting, and lead to right and desirable conclusions and results.

Strength of the Knights of Labor.

IN speaking of the great strike now going on, and extending from St. Louis to the Gulf of Mexico, the *St. Louis Globe Democrat* says: "It is ascertained from the most reliable sources that District Assembly No. 17, with headquarters in this city, has a membership of from 12,000 to 15,000, and within a radius of 300 miles are about 50,000 Knights of Labor. Altogether in the country there are, counting some newly organized assemblies, about 160 district assemblies, some of which are very strong, numerically considered. Some of the district assemblies in the manufacturing districts of the East count up fully 50,000 members, and of the total membership of the order various estimates are given, ranging from 500,000 to 1,500,000. In close connection with the Knights of Labor in this city is the International Working People's Association, which will give the Knights of Labor their moral support, and, if necessary, material aid. Both organizations are said to be in close communion, and will act in concert in any emergency that may arise. The numerical strength of the International Working People's Association has been greatly underestimated, from the fact that they do not care to let their exact number be known. In the various groups of the order are included something like 10,000 members in this State and Illinois alone. In this city and close vicinity are probably 20,000 men who are members of organizations directly upholding the strikers of District Assembly No. 101.

THE owner of one of a row of new houses saw a little girl taking observations on the street the other day and entered into conversation with her. "Oh, yes," she said, "I like these houses, but my papa don't." "Well, what fault has he to find with them?" "He says he cannot drive through this street because they frighten his horse."

Ancient Wood Carving.

AMONG the papers read at a meeting on Monday of the Society of Antiquaries of Scotland, was one on a wood-carver's tool box found in a bog in the island of Avie, Orkney, and exhibited by the finder. The box, which measures 11½ inches in length by 4½ inches in breadth, and 3 inches in depth, is elaborately ornamented by a running pattern of diverging spirals, and other designs of specially Celtic character. The box was furnished with a sliding lid, which is now in fragments, and it contained a series of tool handles made of bone or horn, evidently for carving in wood, or some such purposes. The blades of the tools which have been of iron have entirely perished, but there remains in the box the piece of pumice stone with which the carver used to polish up his work. This box is one of the oldest bits of wood-carving known in Scotland.—*Ex.*

Pay of Architects.

NOTWITHSTANDING all that is said and admitted about the mercenary of clients, the crudeness of popular taste, and the general lack of a critical appreciation of the merits of good buildings, the most serious obstacle to a due recognition



of the architectural profession, by the public, is the unprofessional quality of a large portion of its membership, and often suggests a doubt whether they really know what professional conduct is. Witness the following transaction, of recent date, in a prominent Western city, where a couple of architects, in their eagerness to secure employment, sacrificed every consideration of personal profit and professional dignity. In the city of A it is proposed to erect a \$50,000 building for the Young Men's Christian Association, and part of the funds have already been pledged. Regardless of all professional etiquette, the firm of B & C, architects, addressed a written communication to the building

committee, soliciting employment for this work, and offering to make "all the drawings, specifications, details, etc.," and to superintend the building, free of expense, regardless of what the structure may cost. We are not informed of the final decision of the committee, nor of their opinion of architects who solicit work in this ignoble fashion, but the affair suggests a few very obvious reflections. As for the architects themselves, they could hardly occupy a more humiliating position than that they have voluntarily and gratuitously chosen in this transaction. Had they referred to similar buildings which they had designed and erected, or offered any other evidence of superior qualification for the work they solicit, their position would be different; but to make an appeal solely on the ground of the cheapness of their services, is, by implication, to confess that cheapness is their chief merit. A class of disreputable doctors often advertise, "No cure, no pay," but these architects have gone a step beyond the doctors in offering to take no pay in any event.

Capable talent does not go begging for employment in this gratuitous fashion. Architects who can command pay for their services are not apt to urge them, as a gift, on building committees. Moreover, employment secured in this mendicant fashion, seldom brings any profit or honor with it. The self-abasement at the start invites a series of slights, snubs, and bitter humiliations throughout. Good work, fairly paid for, brings most thanks and favors as well as most profit. The old plea that a man has a right to work for nothing, if he chooses, will not answer in this case. An architect is *ipso facto* representative of the architectural profession, and, as such, is not at liberty to solicit work, or otherwise conduct himself in a manner calculated to bring his profession into public contempt. After he has been selected as architect for a proposed building, he may contribute as large a donation as he chooses, to the cause, either in cash or in personal services; but to offer such donation or gratuitous service as an inducement for the award of the work to himself, is as disreputable in an architect as it would be in a lawyer or a

physician. Such parties consciously set a depraved example, audaciously trusting to the superior honor and self-respect of their *confreres* for the success of their strategy. Were the custom to become general, of soliciting work in this manner, their sole ground of preference would be taken away. They would not dare inaugurate the practice, therefore, but for a confident belief that the most of the profession will be too honorable to resort to it under any circumstances. As for the committee, a sensible man would be very apt to inquire whether it might not be wiser, safer, and ultimately cheaper to intrust their work to a thoroughly responsible and capable architect, at a just compensation, than to risk the fifty-thousand-dollar building in the hands of those who intrusively offer their services for nothing. A good architect often saves more than the amount of his commission in his conduct of the work apart from the superior quality of the building. Moreover, it is contrary to human nature to work without pay, and when people in any business make offers of this nature, it naturally suggests suspicion of some stratagem by which they expect secretly to derive ample profits for their liberality at the expense of a confiding customer.—*Inland Architect and Builder.*

California Building Stone.

THIS is practically a *new find* in building material in this State, although long known and used in the locality of its deposit. One or more buildings are said to have been erected near the quarry, and the effect of time, wear and tear has fully proved that it is of superior quality, although that used for the purpose named was the top rock, below which a much better texture and quality of stone are found.

The specimen left in the office of this journal certainly appears well for all building purposes, whether as wall material, lintels, sills or otherwise. It is from the Valley Spring Quarry, Calaveras County. The color is good, light gray, lighter than the sandstone of Santa Clara County, and would make a very handsome contrast for trimmings in press brick fronts.

It is pure siliceous and silicate of soda, fine grained, easily picked, rubbed, tooled or shaped into ornamental forms. Blocks of any required size or dimensions can be quarried. It is of fine, even texture, very strong, approximating if not equaling that of the best granite, and can be worked at half the cost of granite. There are no muddy impurities in its composition, and exposure to the atmosphere simply adds to its hardening and strength. It is also said to be comparatively fireproof, and consequently superior over granite for columns and lintels.

This stone is not only suitable for all kinds of dimension and ornamental purposes, but splendid for rubble-walls, being much superior to brick in foundation walls.

The need for a stone possessing the qualities claimed for that under notice, has been long felt in California, and it is to be hoped that the material in question will fill up all hitherto deficiencies in the line of a good building stone.

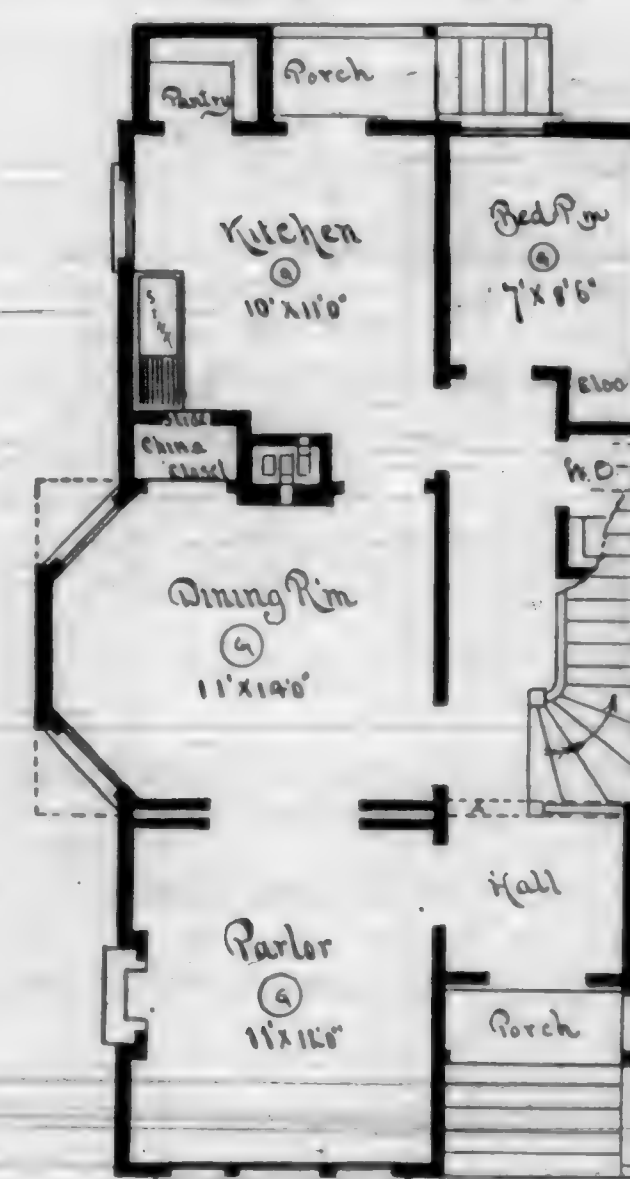
The quarry is reported to be extensive, and so far accessible to transportation that the rock can be delivered in this city at a very low price, as compared with the stone heretofore used in building construction. This being so, there seems to be no reason why it should not come into general use. The specimen in this office is free to the inspection of architects, builders, and owners contemplating the erection of buildings, and to all parties interested in the development of the State.

Examination a Pre-requisite to Practice.

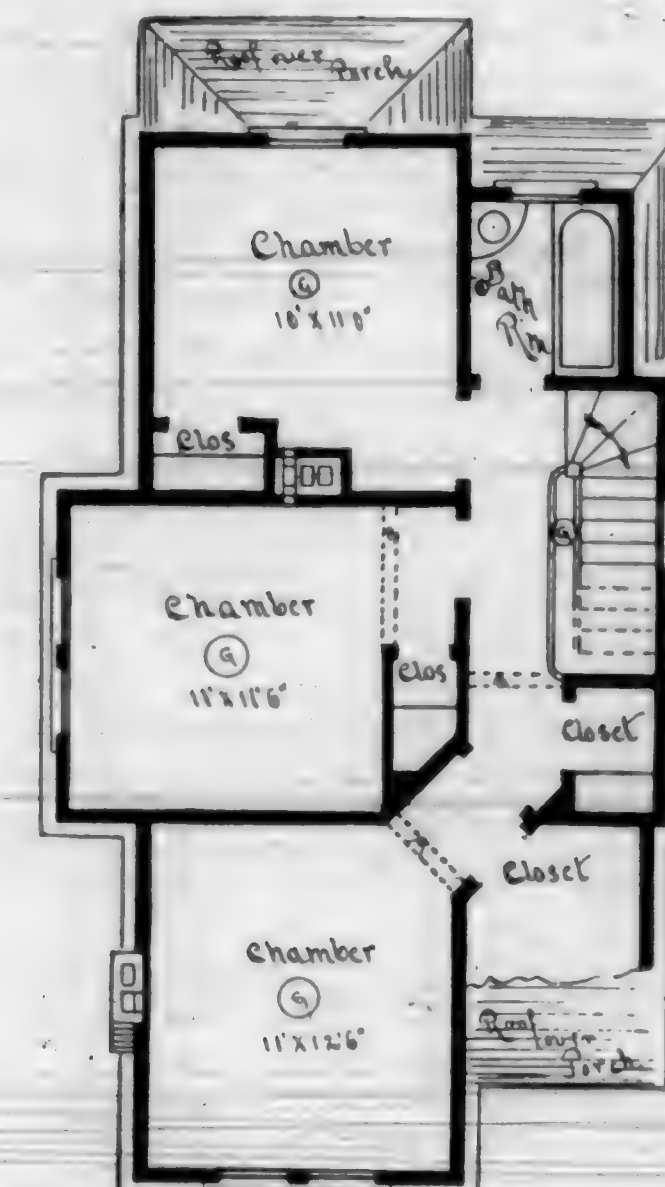
IN an article, "Essentials of a Building Law," the *Western Architect and Builder*, among other things, says: "No person should practice the profession of architecture without first having passed a satisfactory examination before the State Board, consisting of the State Architect, the Commissioner of Public Buildings, and such other members as may be thought best."

In the passage of any law or regulation enforcing the suggestion of our contemporary, which should be national in character, there would be terrible howling in present architectural circles, but not among the intelligent, experienced, and competent men who suffer daily annoyances, if not from direct competition and contact with the minnows that wiggle their tails in architectural waters, then from the innumerable innovations upon right and honorable professional practices, and the shameful abuse of privilege in departures from the consistent and true, and the substitution of the fanciful, wild, and extravagant architectural gewgaws, —not styles founded upon the time-honored orders, nor possessing any recommendation to place them on record as the legitimate offspring or result of architectural culture and refined taste.

If matters could be so regulated by legal, constitutional enactment as to prevent those not qualified from entering into practice,



FIRST FLOOR PLAN



SECOND FLOOR PLAN

and imposing their services upon the unsuspecting and confiding, through false representations of themselves and their abilities to perform the responsible duties incumbent upon architects, owners, as well as qualified architects, and the profession as a whole, would be vastly benefited; for then men would understand that study, preparation, qualification, and the attainment of a proper knowledge of the innumerable details of the science, were an indispensable requirement, and those by nature qualified would seek every other necessary qualification.

Under such a regulation there would be no curtailment of privileges or opportunities to young men. The door of entry would be as widely open and free as now; but it would then be known and understood that the attainment of right and proper knowledge was a prerequisite to the privilege of assuming professional responsibilities as an architect, instead of, as now, any one who pleases, however little qualified, asserting claims to, and playing a part never studied nor understood by them.

Examining Candidates for Membership in the Kansas City Master Plumbers' Association.

A HARDWARE firm in a town in Kansas, desiring to go into the plumbing business, associated with themselves a man who claimed to be a practical plumber. This man made application to join the Master Plumbers' Association of Kansas City. A committee was appointed to examine the applicant and report upon his eligibility for membership. This committee sends us the following report of the examination:

Question—Are you a practical plumber? Answer—I am.
Q.—How long have you been at the business? A.—About twelve years.

Q.—Where located? A.—Run shop four years at Greenville, O., and also at Brampton, Canada; had in my employ fifteen men.

Q.—What are the different grades of lead pipe? A.—Light, medium, and extra strong; iron pipe the same.

Q.—Into how many pieces would you cut sheet-lead to line a tank 3x3x3 feet? A.—Five pieces, one for each side.

Q.—What would you do with the lead then? A.—Scrape it with a scraper, then paint the edges black and solder it.

Q.—What is the proper name for the tool you call scraper? A.—Why, scraper or knife.

Q.—What is the proper name of the black paint you mention? A.—Paint is the only name I have ever heard it called.

Q.—What are the ingredients in this paint, as you call it? A.—I don't know.

Q.—Can you wipe a joint? A.—Certainly.

Q.—Will you go now to Mr. Ford's shop and make one?

A.—Not to-night, as it is two years since I made one.

Q.—How would you proceed to make a branch-joint, and what tools would you require? A.—Have forgotten the names of most of the tools.

Q.—How is a trap ventilated? A.—Never ventilated any.

Q.—What are the different patterns of traps most commonly used? A.—Do not remember.

Q.—What is a hot-water circulation-pipe, and where used? A.—Pipe running from center of boiler to the top of the boiler.

Q.—What is a lead safe? A.—A pay under a water-closet to catch leaks.

Q.—Is there a pipe leading from the safe usually? A.—Yes, going direct to the sewer.

Q.—Are you sure you are a practical plumber? A.—Oh, yes.

Q.—What are the Philadelphia rules for gas-fitting? A.—There are no rules that I know of.

Q.—Did you work at plumbing in Chicago? A.—No; I was with the People's Gas Light Company.

Q.—You still claim to be a practical plumber? A.—Yes, sir, I do.

That is all. The above is a fair sample of the practical plumber found in the tin shops and hardware stores of Kansas; yet they have the unadulterated gall to apply for membership to the Master Plumbers' Association. The applicant was most respectfully told to stick to bell-hanging.

W. F. MCCARTHY,
WM. STOCKINGER, } Committee.
JOHN E. FORD,

[We are glad to learn that men of this class are not admitted to membership in the Kansas Association. We presume there is nothing to prevent this man from experimenting with plumbing work in the State of Kansas, but we hope the time will come when such men will not be allowed to attempt the execution of plumbing work anywhere. This applicant's answer to the question, where a pipe from a lead safe usually leads to, explains some of the illustrations that we give in this issue of dangerous plumbing blunders in Philadelphia.—Ed. San. Eng.]

We regret to add that there are very many of the Kansas City specimens of practical plumbers operating in San Francisco, who could not if they would, execute a perfect piece of plumbing work, and it is doubtful whether they would if they could. This class of mechanical incubuses—frauds in every

sense involving skilled workmanship—are mere tinkers, lacking the natural mental necessities to qualify them to understand the laws of mechanical science, much less to execute them. The "scum of society" is often applied to certain classes, and with equal force and propriety, "mechanical scum" attaches to these tinker practical plumbers, who fail to exemplify more than the crudest forms of mechanical workmanship, without an approach to skillfulness, particularly in those matters in plumbing work which require the nicest conception and application of the plumbing art.

Since the adoption of the plumbing law in this State, this evil has been to an extent regulated, but not exterminated, until the really practical plumbers were driven to the wall by the aggressive methods of the invaders, who have worked themselves in as competitors with competent men. They made no move to reclaim their just rights, but yielded to the pressure, and learned to practice many of the mechanical connubiations by which their enemies managed to underbid and secure important jobs, as well as the greater portion of the smaller class of buildings.

Necessity finally led to the adoption of the plumbing law, which places a check upon the many rascally things practiced under the old personal privilege regulation. But the law is yet too mild, in that, while it restrains and controls the more important departments of sewer, soil, vent pipe, etc., work, it leaves it possible for the Kansas kind to operate.

The law, to be wholly sufficient for the purposes for which it was intended, should require and compel every practical plumber to undergo a rigid examination before a competent board of examiners, denying the right to practice, as master plumbers, to those not capable of answering correctly every essential question connected with or involved in the science of plumbing. Such examination would be an indorsement of competent men, and an exposure of those who, as a class, by their defective workmanship have been instrumental in prostrating thousands of their fellow-creatures upon beds of pain and suffering, and sending as many more to untimely graves.

Spare the Birds.

IN view of the great slaughter of birds in America for sportsmen's pleasure, and to gratify the demands of gaudy fashion, the American Ornithologists' Union has organized a "Committee on the Birds," consisting of Geo. B. Sennett, chairman; Eugene P. Bricknell, secretary; J. A. Allen, Dr. J. B. Holder, Dr. G. B. Grinnell, William Dutcher, and L. S. Foster, all of New York City; Wm. Brewster, Cambridge, Mass.; Montague Chamberlain, St. John, N. B., and Col. N. S. Goss, Topeka, Kansas.

The heartlessness with which millions of the feathered family are yearly destroyed, mainly to gratify the passion in the sportsmen of our country to shoot and kill birds, is incalculably great. The little innocents are shot at simply to illustrate the shooter's skill and proficiency with his gun, or for the mercenary purpose of supplying an article of extravagant ornamentation in the fashion world. And fashion, the foster sister of pride, the mother of untold evils in social and family life, demands its pleasantries and gratifications with remorseless severity at whatever cost.

The object in view by the Union is the obtainment and diffusion of all possible information in reference to the magnitude of the slaughter of birds for mercenary purposes; the destruction of birds' nests, etc.; to develop a public sentiment in favor of rigid protection of birds; to prevent the depredations of sportsmen and boys, and the destruction of bird eggs; to secure more perfect legislation leaving the game birds subject to reasonable season protection.

The committee requests the sending of facts and information from all sections of the country, to their headquarters, at the American Museum of Natural History, Central Park, New York City.

CUSTOMER (entering unexpectedly)—"So, sir, I've caught you putting water in the milk." Milkman—"Yes—er—no; that is, sir, I'm only washing it. You don't s'pose I'm going to serve my customers with dirty milk, do you?"



The Late J. B. Gough.

ALTHOUGH the following resolutions have appeared in the daily journals, we deem it a fitting tribute to the memory of a truly good, and, in his life-time, distinguished worker in the cause of temperance and humanity, to give them a place in the columns of this journal.

Thousands have good and sufficient reasons for thanking God that this earnest man, full of devoted zeal and interest in the cause he so ably advocated, lived and labored so faithfully and successfully, with a power and influence for good not possessed by millions of other good men, influencing tens of thousands to abandon the vice of indulgence in strong drink, and turn their feet away from the paths which pursued, inevitably lead to a drunkard's grave.

If from the confines of the tomb his voice could be uttered, even louder and more earnest than in life would be his cry to the living, Touch not, taste not, handle not the accursed thing.

RESOLUTIONS OF RESPECT ON THE DEATH OF JOHN B. GOUGH.

The following resolutions were offered by Dr. R. H. McDonald and unanimously adopted at a meeting of the International Lodge of I. O. G. T., held in Grand Central Hall, San Francisco, Cal., March 1, 1886.

WHEREAS, An all-wise Providence has removed from the scenes of earth the illustrious and brilliant orator and devoted patron saint of temperance and prohibition, the justly renowned and beloved John B. Gough, therefore be it

Resolved, That we deeply mourn the loss that we, and humanity in general, have sustained in the death of the eloquent advocate, whose life was spent in incessant toil and tireless devotion to the uplifting of fallen humanity.

Resolved, That we tender to the bereaved and afflicted widow and family our heartfelt and sincere sympathy, and assure her that, in this case, her loss is our loss, and that we mingle our tears with hers in this great trial, but hope to meet him "beyond the river."

Resolved, That these resolutions be engrossed, and that a copy be furnished the widow and family of the deceased, and also for publication in the *Rescue*, *California Voice*, and other papers.

The following telegram of condolence was sent to Mrs. John B. Gough and family, by a Past Worthy Chief Templar of International Lodge, 291, I. O. G. T., of San Francisco, and was indorsed by said Lodge:

SAN FRANCISCO, Feb., 1886.

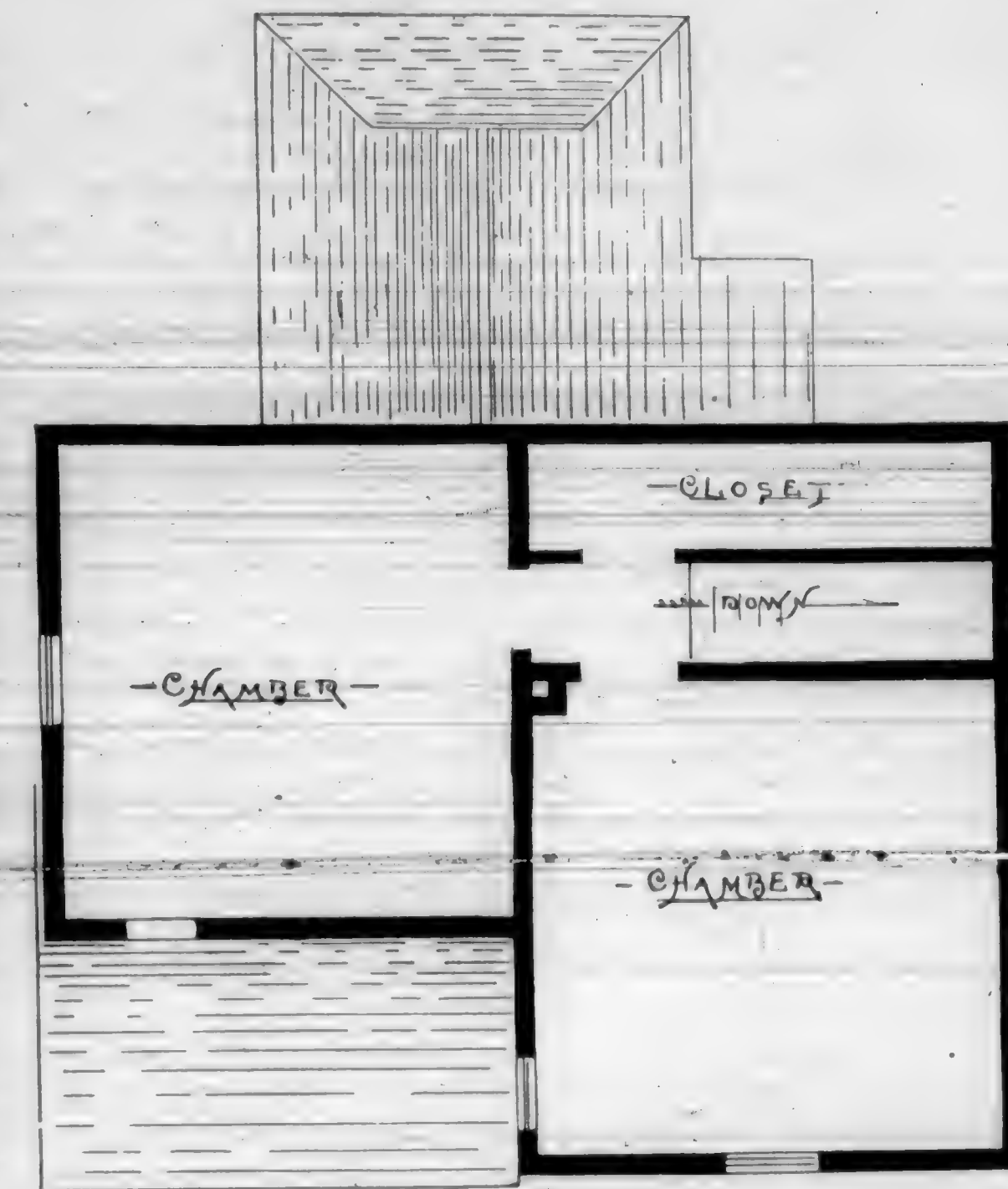
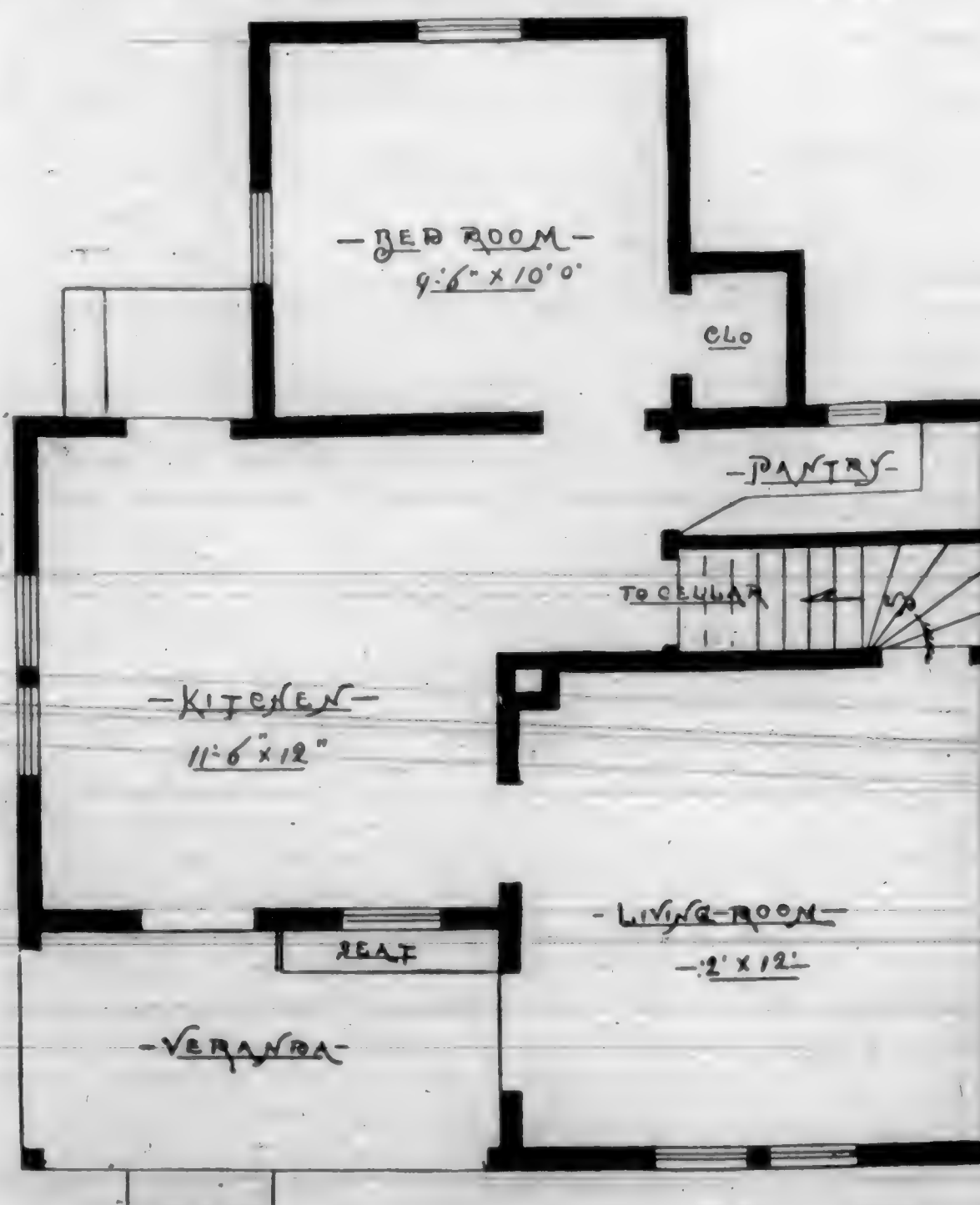
To the widow and family of John B. Gough, Boylston, Mass.

We mingle our tears with you, in this great affliction. Please put flowers on the body for us. We shall meet him "beyond the river." Our flag is half-mast. California mourns the loss of one so honored, so brilliant, so devoted, so true.

R. H. McDONALD.

Secretary, HELENA YOUNG.

An oak mantel imported from England, made by a London manufacturer, bears in the center of its expensive, but plain, upper portion, which slopes backward, a warrior's steel breast-plate and his trusty weapons crossed beneath it. Over the fireplace is a series of tiles, representing a troop of wild horses.



Not Fair Treatment.

THERE is in journalism, as in all other matters and transactions, a rule of right and fairness, which transgressed, is a wrong committed. These may sometimes occur without intent or design, but when frequently repeated, with plain and unmistakable opportunities to avoid them, the design and intent become transparent. This journal was the first, and to-day, is the only, or nearest reliable reporter of the building intelligence in San Francisco. So much so that the city papers generally, have used our monthly, quarterly, and yearly reports as showing the building activities, some giving us due credit always, and some occasionally, while at other times our reports have been appropriated as a whole in such manner as to make it appear that the statements made were the result of enterprise on the part of those journals, filching matter, which of course cost us considerable money and time to provide and prepare.

One of these most glaring illustrations of journalistic profligacy occurred in the *Daily Examiner*, in its issue of March 15, in which our quarterly report and tabulations were copied entire, word for word, a d figure for figure, and the credit given to an obscure sheet that never originated a single fact or figure stated. There can be no reasonable excuse for this, as the journal in question was furnished with a copy of the CALIFORNIA ARCHITECT AND BUILDING NEWS containing said report, and had it wholly in its power to have avoided the miscredit, if it had been so inclined. It would have been a transgression of privilege to copy the item without any credit, but the appropriation of matter from these columns with credit to a source not entitled to it, and from whence it did not originate, makes it more than an oversight.

THE Knights of Pythias Hall Association, by its officers, report 4,201 volumes of useful and instructive books in the library, being a gain of 268 volumes during the year 1885. Number of books issued during the year, to 1,420; readers, 12,568. The report shows a healthy and prosperous condition of things in this department of order work.

A PORTABLE bath, having a flexible rim or water-guard, which is to prevent the floor from becoming splashed, has been patented by J. H. Crocker, Brussels, Ont. The bath has an upright flange, from which four, more or less, radical arms are made to project. These arms support a strip of flexible material which completely surrounds the bath. The arms are held in place by means of enlarged heads that pass through wire loops attached to the upright rim.—*The Brooklyn Real Estate Review and Long Island Record*.

GENERAL GRANT's book will be the best monument of the man; it will show every side of him and show him well.

Science of Architecture.

(Special for this Journal. By F. HILLERY, Architect and Mechanical Engineer.)
(Continued.)

IN the formula designated, v , the velocity of the air at a constant section, $2g = 19.62$, acceleration of gravity; H the height of the channel; T the temperature of the warm, t the one of the cold air current; L , the length of the distances to be conducted; D , the diameter respectively the sides of the channel; U , the circumference washed by the air current; F , the sectional surface of the channel; f , a coefficient of friction, = 0.024.

$$v = \frac{1}{273+t} \sqrt{\frac{2gH(T-t)}{1 + \frac{2gfL}{D}}}$$

When the channel is made of two unlike parts (f_1 of a horizontal or downwards directed and of an ascending channel) then is:

$$v = \frac{1}{273+t} \sqrt{\frac{2gH(T-t)}{1 + \frac{2gf_1L_1}{D} + \frac{2gf_2L_2}{D}}}$$

Letters marked with 1 are index references to the second channel section.

If the velocity v_1 can be expressed by v , probably $v_1 = \frac{v}{n}$ then is:

$$v = \frac{1}{273+t} \sqrt{\frac{2gH(T-t)}{1 + \frac{2gf_1L_1}{D} + \frac{2gf_2L_2}{D} + \frac{2gf_3L_3}{D_1n^2}}}$$

Is the section of the channel not square or circular, and can be set for $D = \frac{4F}{U}$. For more than two channels of different sections is in general:

$$v = \frac{1}{273+t} \sqrt{\frac{2gH(T-t)}{1 + \frac{2gf_1L_1U_1^2}{4F_1} + \frac{2gf_2L_2U_2^2}{4F_2} + \frac{2gf_3L_3U_3^2}{4F_3n^2}}}$$

Ventilation by machine arrangement. Ventilation can be produced either by forcing in of air or by suction; the first is commonly known as "pulsation" ventilation.

Machine arrangements, in most instances, are only applied when, by the heating of the air alone, the required velocity of the same for a safe, effective, and good ventilation is not to be obtained, or when economy or the arrangement of the building should demand it. This can be the case, either with very extensive buildings, for which a central arrangement is needed, and a large extension of the horizontal channels is required; or with buildings whose rooms require a considerable change of air, and therefore necessitate very wide channels, difficult to locate and place; or when, for economical reasons, an unusually large heating of the escaping air would be needed, ventilation would be established by difference of temperature.

In general, for ventilation of buildings, the so-called "blowers" find little or no application, and mostly are used in the so-called ventilators for rooms for manufacturing purposes, where an intense noise made by the working is no objection. In limited number, the so-called "steam injector" ventilators are there applied.

The ventilator, acting either by pressure or suction, or acting by pressure and suction combined, are constructed as centrifugal wings, or as screw ventilators.

The number of the constructions of centrifugal ventilators generally employed is not a small one; the difference between them is mostly in the box and in the form of wings, which are either straight or curved. Ventilators with even wings are applied for small pressure; by higher pressure, in the interest of increasing the degree of effect, curved wings are used. The general

requirements required of a good ventilator are a noiseless movement, the effectiveness at least 0.3, easy and convenient access for removal of the wings, and, lastly, a sufficient strength of the casing.

The number of horse-power N required for the running of a ventilator is direct proportional to the amount of air needed (Q) per second of time, and the pressure (h) expressed in meter by water column, and in reverse ratio to the real effect (e) produced.

$$N = 13.3 Q h$$

The general description of the ventilators are: a shaft, to which are attached either straight or curved wings, or wings of a signet screw shape, inclosed in a wrought or cast iron casing; to the shaft a quick rotary motion by elementary power is given; by it the air is drawn in at the center of the shaft, and by the action of the centrifugal force is thrown towards the circumference and discharged through an opening left in the circumference of the casing.

The steam injection ventilator depends on the action of steam passing from a narrow, small outlet to a wider pipe; the thinning of air hereby created in the latter, by which a suction of the air surrounding the pipe is produced, is then, with the current of steam, conveyed hence. Those ventilators find only application in buildings where the noise produced by the steam is of no disagreeable consequence to occupants of the room, as in workshops.

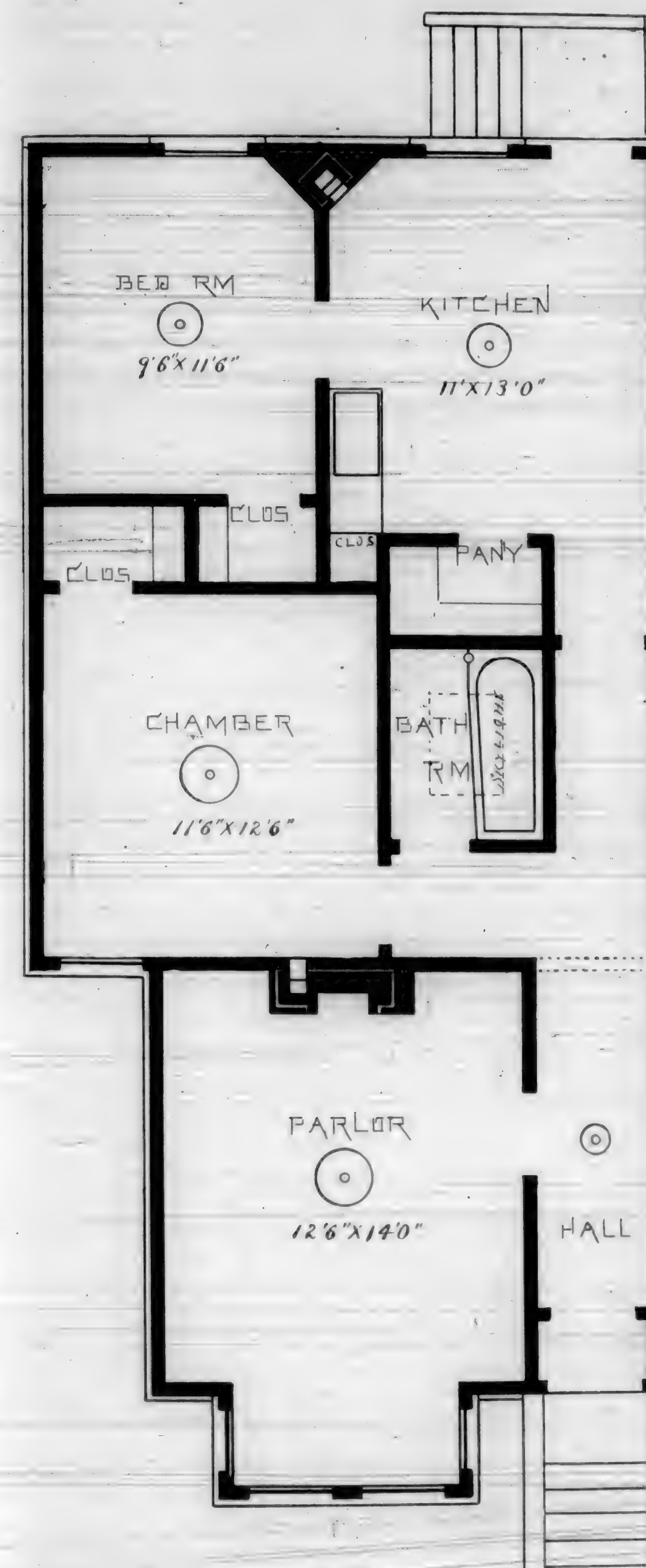
The use of the steam injector ventilator is proportionately expensive, but its advantage consists, that neither machinery nor transmission of motion is required, and the first outlay of procuring them and mounting are small. The effect can be seen by the following table:—

DIAMETER.		DISCHARGE OF AIR PER MINUTE IN CUB.
OF STEAM PIPE IN MM.	OF AIR CONDUCTOR IN CM.	
10	160	6
20	300	25
35	550	100
50	900	250
60	1100	400
70	1200	475
80	1500	625

Compression ventilators can be arranged for direct and indirect action, i. e., that either all air or only a portion must pass the ventilator. In the first instance the air-conducting channels are brought in direct connection with the discharge and only to be considered as a continuation; in the second instance the outlet of the discharge empties in the air-conducting channel, which is connected with the outside air. The air discharged from the ventilator produces a suction on the outside air.

As a rule, centrifugal—wing—ventilators are placed for the purpose of direct action. The placing of screw ventilators is done for the purpose of direct action. Ventilators for suction of air from buildings are rarely

applied. At most they are used as auxiliaries of other systems, since the arrangement of them is mostly complicated, therefore the working of them is difficult, and, in effect, compared with compression ventilators, gives a very unfavorable result. As a rule, it is found that, by the arrangement of compression and suction ventilators together, the first is mostly kept in operation. With the mounting and placing of ventilators, every precau-



and from it to determine the sections of the air channels. It is always of advantage not to rate the velocity of the air too high, and grade, accordingly, the channel section smaller, making, consequently, the use and working correspondingly more expensive, the cleaning of the channels more difficult; and the danger of introducing dust into the rooms is increased and made certain.

In most cases of practical execution, the placing of vertical admission channels (the section of them having been decided on with the aid of ventilation by difference of temperature) offers no difficulties, when the arrangement of the horizontal common distribution pipes meets frequently with considerable hindrance and difficulties. In such instances it is recommendable, for ventilation with the use of machinery, to retain the sizes of the vertical channels calculated with the aid of ventilation with difference of temperature, and the horizontal distribution only in the sections to be taken smaller, to increase in them the velocity of the air.

For the correct calculation of the power required to drive a ventilator, it is necessary to know the pressure of the air, to reach the desired velocity of the same in the channels.

Ventilation of the most unfavorable instance is the one by which the drawing off of the air to above the roof, without heating the same, is to be effected, and by which, even in summer-time, a renewal of the air by the ventilator is to be safely secured.

We can consider the whole arrangement of the channels to be divided in two parts; namely, in the horizontal distribution channels, and in the vertical admission and discharging channels. In the latter exists, in winter-time, an ascending motion of the air; in summer-time, a tendency to settle. For the summer-time the ventilator, therefore, has to counteract, in all ascending channels, the falling motion of the air, as also to force the upward motion of the same. The channel, being the farthest off from the ventilator, is the one to be used for the calculation of the pressure of the air.

To v , the theoretical velocity of the air, which must exist at the bottom of the vertical channel farthest away from the ventilator, to supply the room with the required quantity of air, then is the velocity V , according to which the pressure of the air back of the ventilator is to be calculated.

$$V = v \sqrt{1 + \sum (C_0) + C_1}$$

$\sum (C_0)$ is the sum of the coefficient of the resistances for all the changes of direction in the channels; C_1 is the coefficient of friction = 0.024; l , the length of the air-distributing channels measured from the ventilator; d , the diameter of the channel. For a right angular square section with the sides = a and b is to be substituted for $\frac{1}{d} = \frac{a+b}{2ab}$.

The pressure corresponding to the velocity V in the ventilator is

$$p = \frac{\rho V^2}{2g}$$

Wherein p is the specific pressure of the air in kg. per square meter; g , the weight of one cubic meter of air; $2g = 19.62$, the acceleration of gravity.

Since the weight of 10,000 kg. corresponds to the height of a water column of 10 meters, p will in the same time be obtained as the height of pressure expressed in (mm.) millimeter. For the finding of the theoretical velocity v , are, as long as the vertical channels are computed and executed, with regard to the differing of temperature, the previous formulas used and given; v certainly must be obtained for the winter season as the mean of the ascending velocity in the admitting and discharging channels, while for the summer season, v must be calculated as the mean velocity of the ascending velocity, increased by the acceleration of gravity in the admitting and discharging channels.

ON THE SELECTION OF A VENTILATING SYSTEM.—For the choice of a ventilating system, we have to consider and decide from case to case. There, where the utmost safety of ventilation is desired, it is earnestly to be recommended to make ventilation independent of heating; best to separate both arrangements.

The heating of the rooms is mostly done with reference to the outside temperature, while ventilation is dependent on the adulteration of the air, and the quantity of the same required; each must be accordingly arranged. For each arrangement different preliminary conditions exist, therefore, to work on.

tion must be taken that they are easy of access, and all parts to be open for inspection, and the bearings of the shafting to be convenient for lubrication.

The disposition of a ventilation arrangement for the application of ventilators, does not differ much from the ventilation by difference of temperature. At the lowest point of the pressing air column is placed the compression ventilator (the suction ventilator in the common discharge channel). When, with the calculation for the sections of the channels for ventilation, based on the difference of temperature in the first instance, is to be found the actual velocity, we have for ventilation with ventilators the advantage, to assume the velocity of the air within certain limits,

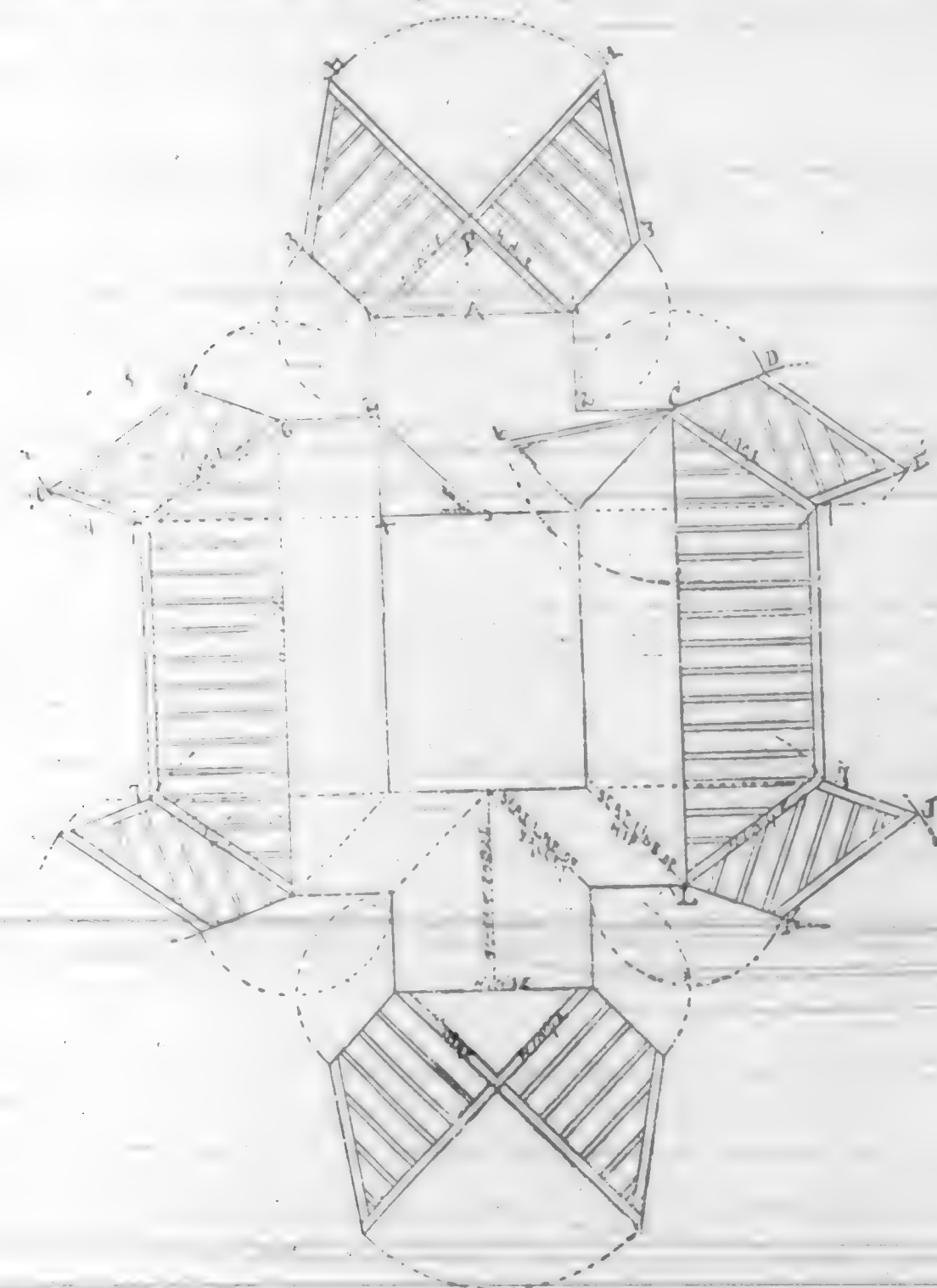
An important factor for the selection of a system is the condition whether ventilation is only desired for the winter season, or for both winter and summer. This condition, and the above-mentioned separation of the heating from the ventilation arrangement, are frequently not sufficiently considered in execution. In the programmes set up for heating and ventilation, we often find the system of heating, as well as that of ventilation, the quantity of air to be renewed, decided without any previous investigation of the question, that by the arrangement of the system selected, the desired effect can be obtained. Before the adoption of any certain system, the building distributions are also to be considered, the highest outside temperature to be ascertained, up to which a full effect of ventilation can be reached. By the highest outside, the most unfavorable temperature for ventilation is then to be concluded, which ventilation system for the case under consideration is to be adopted. Self-evidently in the arrangement, that system will have a deserving preference which is the most simple in execution.

Since hereby the distribution in the building forms a question for consideration, even for buildings serving the same purpose, frequently different systems are applied, and for this reason it is advisable to employ competent persons for the designing of the ventilation project. The designing must be done in time, that the required alterations in the plans can be effected.

ADDENDA.—To measure the temperature of the air, etc., quicksilver thermometers are used. The measure of the temperature depends on the expansive capacity of a fluid, either ether or quicksilver. The fluid to be selected for thermometer must have a uniform expansive capacity, that is, for the same amount of increase or decrease of heat an equal amount of expansion must be obtained.

EDITOR OF CALIFORNIA ARCHITECT—Dear Sir: I herewith furnish a graphic illustration of a hip and gable roof, similar to that appearing in the January number of your journal, by which the roof covering of the ground plan can be found unerringly.

First, draw ground plan to any given scale. Set up the height of roof, say A B, then draw the seat line of both the hips and valleys, on the ground as shown. Square up from the seat line of hips, and set up the height of roof as elevation A B.



Connect C and B, which gives the length of hip rafter. Square out from the deck line, 7-7-7. Take the compass and stand in C, and open up to B. Describe curve cutting at 7. Connect 7 and C, then C and 7 is the length of the hip rafter that will stand over C A in the ground plan in position.

Come back to A B, draw the common rafter or gable end, and square out from common rafter as shown. Take the compass

and stand in 1. Draw the curve from 2, cutting the line squared from the common rafter at 3, each side. Take the compass and stand in A; open out to the face line of deck, and with that distance stand in B and cut the lines marked H H; then connect H and 3 each side, and H and 3 will be the length of valley rafters, to stand in position over 2 5 in ground plan.

This brings the problem to the most difficult cut in the structure,—the finding of the correct lean. Draw a line from 2 to X in the ground plan, and set up the height of elevation; connect 2 and 5; take in the compass, the distance 2 5, and move over and stand in 7; draw the curve marked 8; come to number 6; stand in 6 with the compass, and open out to number 2, and draw the curve cutting at 9; connect 6 and 8, which will give the correct incline or lean of timbers. The outside commencing at 1, cut to 3; from 3 to H; from H to B; from H to 3; from 3 to 1. Cut from C to D, to E, to Y, to J, to K, to L.

Now weaken at where hinge is printed, and fold from you, and stand up on the ground plan lines. This will give a model showing every timber in place, and, in fact, give a better illustration of construction than pages of written explanations.

M. J. MARION.

THE PROFESSING ARCHITECT, AS SEEN BY SOME OTHERS.—Men who live in houses do not build them; they hire them and have a hope—which by this time cannot be called reasonable—that the landlord has built with a view to comfort. Not so; he builds with a view to money, and the tenant suffers every day of the year, because the simplest precautions have not been taken in building to meet the changes arising from variation in temperature. It may be wrong to blame the landlord, or even the speculative builder, when the right person to blame is the architect. So far as the outside world may judge, the profession of "architect" is, from first to last, a delusion and a snare. The only thing the "professor" is good for is to blackguard the Government (or municipal authorities) or private individuals, over every bit of work done. No work is ever done by the right person, or is well done. The latter is unavoidable; for what capitalist can decide as to the right party, or how can the man act freely when selected, when every other member of the profession is like a tom-cat, snarling at every design as a whole, and at every detail in the design? Who ever heard of an architect paying attention to common-sense suggestions in designing the miles upon miles of houses in the towns of England? And surely some architect has been consulted in the majority of cases. The aim is to make a something to look at from the outside, while comfort and convenience are of no import.—Contractor.

Abrogation of Treaty.

THE speech of the Hon. John H. Mitchell, of Oregon, before the Senate of the United States, February 26, 1886, if in any part at variance with the laws of nations, or questionably strong upon the matter of abrogation of treaties, it nevertheless enunciates the correct and only true doctrine applicable to the Chinese issue. If the presence of Chinamen in the United States is an evil, and such it is known to be to every man who understands and comprehends the whole matter in its full and correct light, then any necessary measure calculated to crush out the evil is legitimate, and no fancy philosophy of treaty obligation should be permitted to intervene. As a matter of course, "silver-tongue" orators, and minds and intellects capable of glossing over and beautifying surfaces, and concealing the underlying and material facts of any issue, may work up appearances to a degree that will make the true seem false, and the false assume the brilliancy of truth. Fine-spun arguments and theories, covering special points, or spread out over all creation, are often made to appear as gilded certainties; while in real fact the structures so reared have no foundation below the surface. Many of the social evils, which are revolting to every refined mind, judged from the standpoint of moral rectitude, are surrounded and impregnated with alluring and pleasurable argument—so much so that millions of men and women the world over, accept them as good, and blind their eyes to underlying facts and consequences.

So in reference to the Chinese question, many good men and women who look only at the comitig, theoretical, humanitarian, Christianizing side of the issue, fail or refuse to go below these superficial aspects of the case, and hence are in total darkness and blindness as to true merit. If these "poor heathen" are to be pitied and helped by the people of the United States, that call of mercy is as loud and strong to every other Christian nation, and we fail to discover the obligation resting specially upon us as a people, to accept the whole burden that should be distributed over every civilized land, in permitting the hordes of slaves, and

the minions of vice, idolatry and heathenism from China, to swarm this grand and glorious heritage, which God in his great goodness has intrusted to us, filling it with every good and happy thing, and making it, as it has been and is, a light to the world, whose beams of freedom and prosperity have shaken, and are at the present moment causing the thrones of kingdoms and empires to tremble, and the down-trodden of earth to see and claim their individual rights.

If we keep the Chinamen at home in their own land, then this nation will be able to help them. Millions of money and thousands of self-sacrificing missionaries may be sent to the flowery land to teach the children of the sun—the followers of Confucius, better things, and establish among them the royal principles of a holy religion, and assist them to raise themselves as a nation, to that higher plane of life enjoyed by the Caucasian race upon this great continent. But if they are permitted to swarm hither, as they will by millions unless the avenues are barred, the period is not long distant when they will assume an attitude of fearful consequence, controlling labor, mechanical, and financial interests to such an extent that the dragon flag will float on every breeze from ocean to ocean, and the triumphs achieved by them will but stimulate the pride of victory and rebellion against our institutions more bitter and relentless than was ever known in the internal conflict of nations. Chinamen have no love for Americanism, beyond its gains and profits, and with these at their command they will spurn our philanthropies, hate our religion, despise our institutions, cling to their idolatry and vices, and make this, the land of the free and the home of the brave, the revelling place of all the abominations that at present curse and degrade the people of the Chinese Empire.

These are the possibilities, with open ports and all restrictions upon Chinese immigration off. China can spare twenty or more millions of her subjects, and with free entry and general encouragement in trade, manufacture, commerce, etc., it would be a matter of but limited time when their numbers in this free land would reach in millions what they now do in hundreds of thousands. And with this increased number, and a like multitude coming, and waiting daily to come, with full privileges after arrival, the white man would indeed be compelled to hang his harp upon the willows and weep over the desolation of his once happy country. The comparative few who have come among us have practically solved this apparently problematic question, and clearly and unmistakably indicated the results that would follow the influx of several, if not twenty, millions of the race.

But such a state of things cannot, will not arrive. The effect of Chinaism upon the interests of the country is too well defined and certain, and is too well understood by a sufficient number, to be permitted to longer rest in peace, and prosper. And if delayed for a period, the time will come when the safeguards against this gigantic monster will be made so strong that our working people, manufacturers, and others, will be secured against Chinese encroachments.

The Working Classes as Drinkers.

THE terribly pernicious and demoralizing habit of indulgence in beer and whisky drinking by millions of wage-earners in the United States, with the number many times multiplied throughout other parts of the world, is one of tremendous proportions and magnitude. Although, strictly speaking, this may be a matter of personal, social, moral and physical import, its effects and result so far impregnate and enter into and affect mechanical, professional, and all other circles of brain and muscle workers, that class journals in whatever interest published, as well as those devoted specially to moral and reformatory matters, are fully justified in any reference to the subject calculated to show up the resultant evils, and cause—if perchance it may be so—some to consider the folly and injuriousness of the habit, and to view it in its true and too often fatal light.

The living evidences of mental and physical wreck and ruin through indulgence in intoxicating beverages, are in numbers, beyond all computation. Millions of otherwise most noble and excellent men, capable not only of mastering the intricacies of the mechanical and professional arts and sciences in their unlimited forms, features, and applications, but of filling, honorably and well, high positions among their fellow-men, in social, business, and domestic life and relationship—men of courage, genius, and

nobleness of soul and nature,—become weak and puny slaves,—submissive, pliant vassals to an unholy and base mastery,—the indulgence in that which has destroyed more of human life and happiness than all the bloody wars of time, and the pestilences, famines, floods, fires, and destructive agencies that have visited earth's surface since the day when the juice of the first apple was tasted by the woman in Eden's garden.

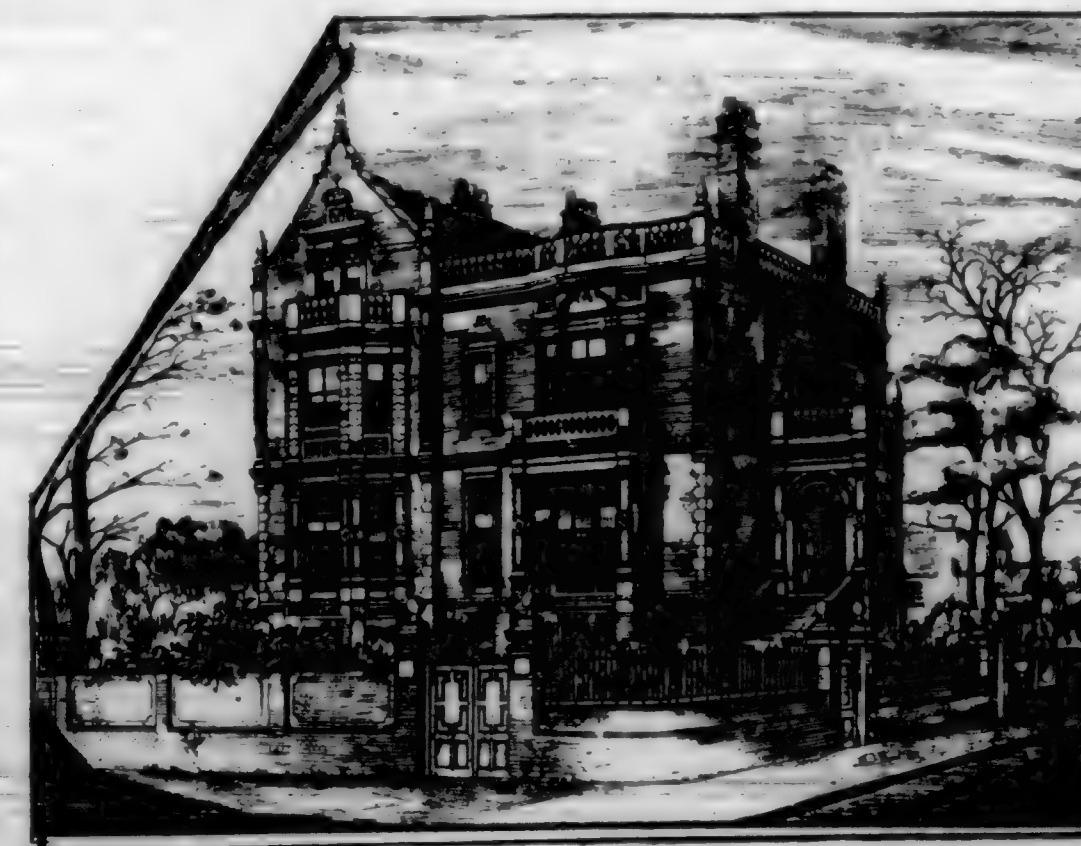
It is fearful to contemplate the vast number of men badly damaged in purse and person by the use of alcoholic and malt beverages. The practice is almost universal, especially among certain classes of working people, who make "swill-tubs" of their stomachs through weakness in themselves to regulate and control an insatiable appetite for drink. The man of strong muscle and sinew arm becomes a feeble, pliant, moral coward, daring not to assert and exercise the noble prerogative of a man, even over the one little string in his make-up—a perverted taste for alcoholic or malt liquors. It is shameful and painful to see so many men bend and give way to a habit which curses always; blesses, never. Its blight is seen in nearly every workshop where the hardy sons of toil meet to labor, and in all assemblages where they gather to discuss questions relating to their labor rights and interests; and the contentions and disagreements that so often arise in such connections are stimulated and promoted by the disordered conditions of mind produced by the use of fluids not found in the laboratory of natural things, except by and through the manipulations of mankind, in changing and producing from the (in themselves) harmless, health-preserving, and life-sustaining fruits, cereals, berries, and products of the earth, to produce poison for souls as well as bodies. And still sadder, the shadows of the same curse darken the homes,—the citadels where love, devotion, and sacred peace alone should be found,—of millions of families, rending and sundering ties, and casting down in sorrow and discomfort, if not in positive misery and debasement, wives, sons, and daughters, and making him who should be loved and honored as the strong support and defense of the home circle, a creature to be unloved, if not shunned and despised, as much as pitied. For he who, by willful, continuous, unmanly submission, yields to temptations and practices full to overflowing with evil, and destitute of any and every attribute of goodness, places himself in the attitude of a willful transgressor, and merits not those considerations due, or which it would be reasonable to extend to those who err, repent, and forsake their errors.

Whether so much so in other cities as in San Francisco, we are not prepared to say; but the fact with us is that, admitting the theory of St. Paul to be correct, that "a little wine for the stomach's sake," is good, the thing is overdone. Tens of thousands of men who devote their lives to manual labor, to keep within the measure prescribed by the apostle, "a little," would require food and drink receptacles as large as the pouch of the unfortunate Jumbo; and in far too many cases, the masters are but little behind the servant. Nor does the evil stop at these limits, but is found among those not wearied by hard strain upon the muscular forces; among men devoted to intellectual and professional pursuits, where the mind is in continuous exercise with subjects and matters which should inspire refined thought and develop control over every wrong doing, and every disposition and feeling calculated, if exercised, to work a moral or individual injury.

It may "do no good" to thus refer to this monster evil, but it affords conscious satisfaction that we have performed a simple duty, and that— from purest motives toward the large number of men in all pursuits, with whom business relationships enforce contact.

FRENCH POLISHING.—The surface of wood-work, if the woods are valuable, is furnished by French polishing. A solution of shellac is put on a rolled wooden rubber, which is then covered with linen, and a drop of linseed oil is applied to

the outer surface. The solution is rubbed in with a circular motion in successive fine coats, until a glossy and air and water-proof surface is obtained. French polishing preserves woods liable to split, such as oak, from the too rapid action of the air.



A Library of Wooden Books.

ONE of the most curiously original collections of books in any library is said to be a botanical collection at Warsenstein, in Germany. At first sight, the volumes appear like rough blocks of wood; but, on closer examination, it is found that each is a complete history of the particular tree which it represents. At the back of the book the bark has been removed from a space large enough to admit the scientific and common name of the tree, as a title. One side is formed from the split wood of the tree, showing its grain and natural fracture; the other shows the wood when worked smooth and varnished. One end shows the grain as left by the saw, and the other the finely polished wood. On opening the book one finds the fruit, seeds, leaves, and other products of the tree, the moss which usually grows upon its trunk, and the insects which feed upon the various parts of the tree; to all this is added a well-printed description of the habits, usual location, and manner of growth of the tree.—*Decorator and Furnisher.*

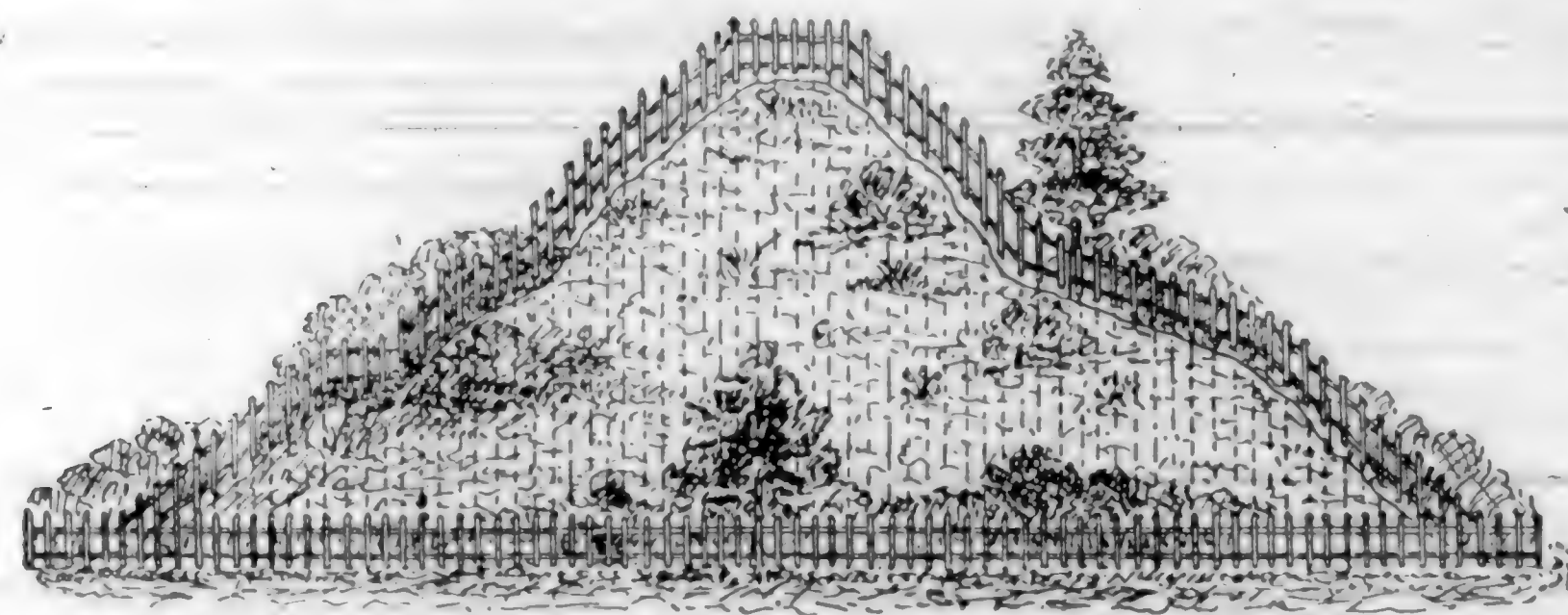
Picket Fence over or Through a Hill.

EDITOR OF CALIFORNIA ARCHITECT: Will you please decide, in your journal, the following dispute. A says that it takes no more pickets to build a fence over a hill than it would to build a level fence in a tunnel running through the same hill.

B contends that it will take as many more pickets in the over-hill fence as there is number of feet greater than at a level line; that is, if the distance from two given points is 500 feet through the hill, and it requires a rope or line 1,000 feet long to go over the hill from and to the same points, the number of pickets will be double, the pickets being spaced the same in both cases.

PICKET.

Answer.—A is right. The same question has repeatedly been asked of this and other journals, and in a former issue we exemplified the problem by the following cut:



As will be noticed, the pickets being put on vertically in both cases, spacing them the same distance, the pickets of the hill fence occupy the same relative position as those in the level fence, as far as the horizontal distance is concerned. It matters not how abrupt or high the hill may be, the vertical lines and spaces being observed—say three inches apart—the same number of pickets would be required in either case. The confusion arises from the fact that the measurement over a hill is greater, and at first thought any one not posted is likely to arrive at the conclusion that, with two pickets to each foot, 1,000 feet must necessarily require 2,000 pickets, while 500 feet on the level measurement would require but 1,000 pickets. The longer measurement over the hill applies to rails only, which in either case must be equal to the measurement from point to point.

Ventilation of Schools.

Boston, March 1, 1886.

TO THE EDITORS OF THE AMERICAN ARCHITECT—Dear Sirs: I did not intend to intrude upon your paper again, although, when I read your comments of my communication on the above subject, I began to think that the study I have made of the subject of heating and ventilation of school-houses had not been very profitable, or else your comments were not in accordance with the facts in the case.

We cannot tell what architects could or would do, but only what they have done; and I still contend that to Mr. Vinal, City Architect of Boston, belongs the credit of the best ventilated schools in New England, with the exception of Mr. Briggs's school, which I consider to be a fine example of scientific ventilation. You speak of the Worcester High School as an example of a well-ventilated building. The following is what Dr. Lincoln has to say about that school-house:—

"Worcester High School.—A large and pretentious building of brick and stone on prominent rising ground. The rooms are very high. The doors opening to the rooms are kept open to the very wide halls, and the air is not distinctly bad, though somewhat close. There is a considerable number of flues *not heated*. There is a large room used for drawing by fifty scholars, and once a week by ninety, which has *no ventilation*, and is *probably close*. The hall in the upper story is rather dark, owing to the lowness of the windows. The chemical library is neither well lighted nor well ventilated. The cellar is very large, and badly lighted. It is too wide for lighting. It is used by the boys for play, and is not a very desirable place. The same want of light is found in the water-closet in the cellar. The room for the boys' clothes, also in the cellar, is very neat and convenient, but has *no ventilation*."

Those who have made a study of scientific ventilation know that a lot of foul-air flues in a building do not of necessity secure ventilation, and, to say that considerable attention has been paid to ventilation, often means nothing more than that a lot of tin pipes or flues have been placed in a building to carry off the bad air, if it is disposed to go that way.

I do not think any ventilating engineer or practical man would care to provide for more than thirty cubic feet of air per minute per scholar, in the winter time, at least, as to produce more than that would be a needless waste. In regard to using fans for ventilation purposes, there are fans and fans, and the writer has only to say that those now in use in five of the Boston schools are not likely to be stopped, either on the account of expense or the neglect of the janitor. Regarding the expense of fan ventilation, Professor Trowbridge, of Columbia College, is authority for the statement that a given amount of air can be moved cheaper, at all times of the year, by means of a fan than by an aspirating shaft.

EXPERIENCE.

[We are not yet convinced that Mr. Vinal and "Experience" are the only architects in New England who have made "a scientific study" of school-house ventilation; but we leave the matter for those who have done so, if there are any, to come forward and defend themselves against "Experience's" imputations. In regard to the Worcester school-house, it is, however, only fair to Mr. Richardson to say that the drawing-room and chemical laboratory are probably placed in positions not intended for any such purpose, and it is not necessary to infer from Dr. Lincoln's description that the architect did not intend to have some means provided for securing a movement of air through his flues, whatever may be the present method of carrying on the building.—Eds. *American Architect*.]

San Francisco Chapter of Architects.

THE regular monthly meeting in March, was held on the 5th, with President Curlett presiding, B. E. Henriksen secretary, and a good average attendance of members present. After roll-call, reading and approval of minutes, and reports of committees, a general discussion ensued upon several matters of interest.

1. The necessity of the Chapter knowing its actual strength in paying membership. This point was dwelt upon as one of great importance to the welfare, and usefulness of the Chapter. A number of names of practicing architects appear on the roll, who never put in an appearance at the meetings, and who as much neglect the payment of yearly dues. This throws increased responsibilities upon the active, interested members, and, for the time being at least, thwarts and hinders carrying into practice the many grand objects and purposes contemplated in and by the organic laws of the institution.

2. The necessity of having a room devoted to the special uses and purposes of the Chapter. As to the importance of this, there was no dissenting opinion. Beyond question, a headquarters, a "home" for the Chapter would be a strong link in the chain of its future usefulness. But to procure a suitable room, furnish and equip it in such shape as to make it a pleasant, agreeable, and instructive place of meeting for personal resort, etc., will require more money than the present resources of the Chapter will furnish. The question then, under such circumstances intervenes, How shall the funds be raised to meet the emergencies? Shall the few dip deep into their pockets to furnish the required coin? More generous and more creditable to a time-honored profession would it be, that every reputable architect upon the

Pacific Coast—especially those in San Francisco and California—unite in membership and bear an equal part of the financial burden, by the payment of such amounts of yearly dues as may be necessary to carry on and out the Chapter work, objects, and purposes.

3. The constitution provides among other things, that in cases where students employed in offices of members of the Chapter, who travel through our own or foreign lands for the purpose of perfecting themselves in the higher studies and practical observations of the science of architecture, the Chapter may, in its discretion, extend to such students financial aid and assistance, requiring in return that such student consider himself, to a certain extent, the *protège* of the Chapter, and make regular reports of all such matters and objects coming under his observation as might be of interest to the profession on this coast.

In this connection is the case of Mr. Stone, a San Francisco student, who has made for himself a most enviable reputation as an earnest, persistent, and determined worker, with every energy taxed to its utmost to prepare for reputable, honorable, and successful future practice. Mr. Stone is about to leave for the East and Europe, and is the first to offer the Chapter the opportunity to carry into practical effect the provisions of its own laws. A committee, consisting of the class teachers and the president, was appointed to consider the matter and report.

THE APRIL SESSION OF THE CHAPTER

Was held on the 22d instant, and was largely attended, President Curlett presiding, and B. E. Henriksen, Secretary.

The proceedings were marked with more than usual interest. After disposition of minutes and reports of committees, propositions for membership as fellows were received from Messrs. C. I. Havens and David Salfeld, and referred to proper committees.

Mr. Macy suggested the propriety of the Chapter adopting a form of diploma, or certificate of membership, suitable for framing, to be distributed to such fellows of the Chapter as may desire to possess that form of evidence of honorable membership. The matter was referred to a committee consisting of Messrs. Macy, Sanders, and Whittemore.

THE GIRDER.

At this point, Mr. Sanders occupied the floor for the purpose of reading a paper relating to the matter of girders. The theme reviewed and discussed in Mr. Sanders' reading was not exclusively the girder, but a range of thought embracing much of interest in an architectural and civil engineering sense. Mr. Sanders presented a number of hastily prepared sketches of girders, simple and compound, which explained themselves at a glance to those present, as to their generally understood and common uses and applications.

We had hoped that Mr. Sanders would have been able to prepare a set of girder sketches, such as might have been reproduced in the columns of this journal, and a treatise on the same for publication. But press of business engagements prevented this, and we have one less valuable article and exhibit for this issue than we fondly anticipated. Mr. Sanders was requested to pursue the subject and entertain the Chapter at an early subsequent meeting.

An animated general discussion followed the reading, in which many good and practical suggestions were made bearing upon girders, building construction, sidewalk beams, the lateral and compressive qualities of wrought and cast iron respectively, and other pertinent matters.

FROM LONDON.

Mr. Smith, from London, being present, was invited to participate in the talk, which he did with profit and pleasure to those present. Among other things mentioned by the gentleman in reference to girders was that, owing to the well-known fact of the expansion of iron by heat, iron girders are rendered less desirable in building construction, and the greater the length, the greater the objection; while wooden girders, unprotected, burn out as do other parts of the inflammable material, and in both cases walls are thrown down, or so badly sprung or damaged by conflagrations as to require being taken down, which would have remained good and sufficient for reconstruction purposes, but for the girder difficulty.

CASING WOOD GIRDERS WITH SHEET IRON.

As a remedy for the two evils mentioned, Mr. Smith stated that in his part of the world, wooden girders were more generally used in the class of buildings not constructed as a whole or generally of indestructible materials; but to render them preferable, a casing of sheet iron is applied, which makes them practically imperishable in cases of fire.

PIT PROTECTION FOR SAFES.

The gentleman also alluded to the fact that in the great metropolis of the English nation, as an absolute fire and burglar-proof protection to safes, pits are sometimes constructed of the required depth, with hydraulic attachments, of suitable power, presumably similar in action to the hydraulic ram elevators in use in San Francisco; and after the business of the day is over, the safes are secured and then let down into the pits, below the desired level of floor or ground, to remain until lifted again for purposes of business. In this way, all the securities afforded in first-class fire-proof safes are enjoyed, with the additional protection of being virtually buried up in vaults or pits below ground, so as to prevent the slightest effect from fire, and certainly largely increasing the impossibilities of burglarizing.

Altogether, the April session of the Chapter was one of the most interesting and profitable that marks its history.

If the honorable members of the profession, as a whole, would join in the Chapter work, and unite and co-operate heartily and unselfishly for its advancement and building up, in a very short period of time San Francisco Chapter would rank high among the many organizations working in scientific and professional interests; and, as far as its special object is concerned—the science of architecture—it would be regarded as the one great authority in that direction. Its doors are open, and its approach crowned with the word *welcome*, to every worthy and honorable member of the profession upon the Pacific Coast.

Literary Notes.

THE March 6th issue of *Building* contains the second paper on "Slow-burning Construction," by W. H. Dabney, Jr., architect to the Mutual Factory Fire Insurance Companies, of Boston; the continuation of Mr. Warren R. Briggs' excellent series of articles on "The Planning and Construction of School-houses," with plans and perspectives of a model suburban school. Mr. Wm B. Tuthill, architect, continues the discussion in his articles on the "City Residence, Its Design and Construction," of various plans for apartment houses, including what is known as the Duplex system. Various plans of apartment houses are given in the text. Mr. J. Pickering Putnam, well-known through his "Lectures on the Principles of House Drainage," speaks of the necessity of thorough ventilation for soil pipes and waste pipes, and of the evils and objections to special trap ventilation, in his article on "Improved Plumbing Appliances." There is also an illustrated article on the Street Memorial, in the Royal Courts of Justice, London, a Book Review Department, the Weekly Report on the Real Estate Market, a trade supplement reviewing the industrial progress, and a four-page supplement of the *Building News* of the week, besides editorial comments on the topics of the day. In the illustrations, sketches are given for small laborers' cottages, for a country church, details of a staircase hall, for a city house, finished in oak, and the perspective view and plans of the new Club House for the Elmira Athletic Association.

THE March number of *Art and Decoration*, an illustrated monthly devoted to interior and exterior ornament, contains some very interesting articles on colors, imitation stones in ornamentation, interior sketches and decorative Japanese work, and many short articles, valuable and interesting. This journal should be in the hands of every one interested in art decoration. Subscription price, \$2.50; single copies, 25 cents. Published by Art and Decoration Company, No. 7 Warren Street, New York.

Brick, Tile, and Pottery Gazette, heretofore appearing as *clay*, comes to hand in new dress and arrangement, with fourteen pages of interesting reading matter, and a range of advertisements comprehending all machinery used in the working of clay, and the manufacture of drain pipes and pottery devices. Subscription price, \$1.00 per annum. Ottawa, Ill.

Be Thorough.

"A LICK and a promise," is the way the botch calls it. "That will do for the present," is what the procrastinator says as he half does some job. Young man, you are not to live for the present, but you are to build for the future. If you would be a success, be thorough. Are these school-days with you? Get your lessons thoroughly. You will not only be better prepared for what follows by getting the lesson of to-day thoroughly, but you will acquire a habit that will be valuable all your life. If you are a mechanic, or farmer, or clay-worker, remember that whatever is worth doing at all is worth doing well. Be thorough!—*The Clay Worker.*