

Old English Homesteads.

BY A CURTIS BOND.

THE structural stability of old English dwellings and the massiveness of their material, has preserved a vast number of them dating centuries back. In the superior class of residences there is ample provision for indoor comfort, whilst the prevailing disposition was to put wood to its best account in turning and carving, and to hide the nakedness of walls by paintings, which, if gaudy, were at least suggestive.

It is noticeable that in houses of any pretensions the ornament was such as to give it a distinctive and appropriate character. The room of Mary, Queen of Scots, at Hardwich House, Derbyshire, has panels of inlaid woods representing profiles of the Cæsars. The state-room walls are divided in half the upper portion, having landscapes and figures on a white ground, tapestry covering the lower portion.

An early poet tells of a room on the walls of which appeared,

"Old portraitures
Of horsemen, hawks and hounds,
And hart all full of wounds."

The designs were often only outlined or roughly filled in, but the scenic effect would be heightened by the light being admitted through narrow, casemented windows, and never too abundant.

The bedsteads, not infrequently placed on an elevated platform, were of so solid a character as to well merit the designation in wills and other documents, as "beds of tymbre." That of Henry VIII., now to be seen in Hampton Court, is described in an old inventory as having "postes and head curiously wrought." Old oaken chests, oddly carved, were invariable accompaniments of dining-room and sitting-room furniture.

Ends and backs of benches for the dining-table, massive and richly carved, were prominent features of the decorative ensemble and the extent to which ceiling decoration was carried, contrasts strongly with the prevailing plainness which succeeded, but the sunken panels, with carved borders, were in keeping with the walls of the room when of wood, and which, in paneling and coloring, were singularly ornamented.

Domed, scenic, oval, masonry recesses were frequently planned by architects to hold the side-board, and thus prevent them from obtrusively occupying the floor space. An immense amount of carving was often lavished on staircases, which, with their ample breadth, were always rendered a prominent feature, the effect being aided by the practice, from the time that glass came into general use, of lighting them from above. In old drawings of manors, with surrounding grounds, the garden pavilions in stone or brick, and composition or wood, on which much care and cost were lavished, form conspicuous features and are suggestive of a departure in architecture with ourselves in this line. The pediments of many

of these wooden temples, in rustic or classic form, were adorned with figures of satyrs, the graces, griffins, dragons, etc., in short, all descriptions of vagaries, not to be too critically scanned, serving to gratify the sight, the sport of fancy breaking away from the conventional styles of more permanent erections.

Evolving from the early house of the past generations of Englishmen to the present business house of New York City, is a progression by no means so violent in its change as would appear at first sight, for the constructive qualities of both are worthy of especial notice in their stability. The architect of the modern building has discovered that permanency in his structure is an element essential to their appreciation and necessary for his own reputation. In fact, singular as it may appear, more attention is given in New York to the construction and substantiality of business buildings than of residences. Dwellings, where possibly a dozen different families are congregated, on fashionable flats, renting from \$2,000 to \$6,000 each apartment per year, are made in a flimsy and precarious way when compared with the magnificent stone buildings constantly being put up in the lower part of the city. The protection of human life, in a word, is a secondary consideration to the safety of books and office furniture.

Early in May a large number of firms will remove their offices to a new building (referred to some months ago), on Nassau Street, between Cedar and Liberty, occupying the site of the old post-office. Masons are busy laying the stone in the main hall, and plasterers are putting the finishing touches to the walls. Every day witnesses new crowds gathering on the corner of the streets thereabouts to study the ornamental features, which are so plentifully shown.

The building of the Mutual Life Insurance Company is destined to be an architectural attraction for the prescribed ten days, which is the duration of wonder in this country, and by the end of that time, no doubt, another edifice will have been started with novelties shown in its construction and ornamentation that will detract attention from the present. That, in its turn, will be eclipsed by other efforts, and so it will go on, as Dean Swift says, "*ad infinitum*."

The portico of the Mutual Building is two stories in height. The first story consists of large piers of granite, the alternate blocks polished and fluted. These are planked by two very handsomely polished Quincy granite columns. The frieze contains a panel upon which the title of the company is set in polished granite letters. The ceiling of this story of the portico is paneled with richly moulded squares, three in number, which inclose foliated rosettes, elaborately carved, all in strict conformity with the style of the building, which is Italian Renaissance. The capitals of the polished columns are of white Italian marble, decorated with handsomely modeled cap-work. The second story is of Indiana limestone. The piers, unlike those of

the first story, are paneled, and enriched with elaborate carvings. Next to these piers are granite columns smaller than those below, and supporting an arch with a vaulted paneled ceiling.

The capitals of the flanking piers contain heads typical of Europe, Asia, Africa, and America. Europe is represented by the head of a Caucasian, Asia by the head of a Chinaman, Africa by a negro, and America by the everlasting Indian. They were modeled in Rome.

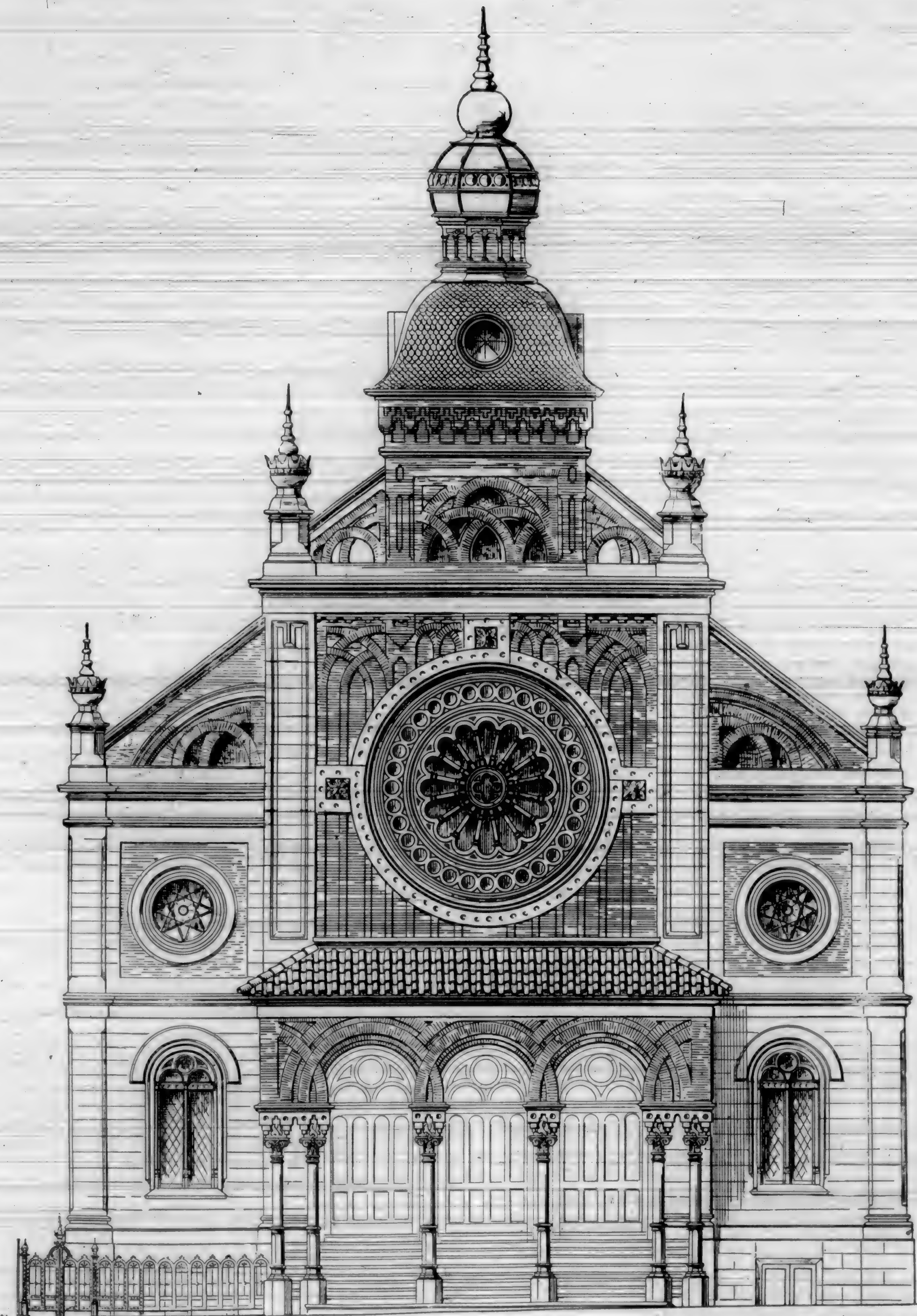
The whole building is so harmonious in its proportions that the size of the portico is really lost sight of, and is beyond what an ordinary observer would imagine. Its length is over 64 feet, and its breadth over 26 feet. The building is 185 feet in length on Nassau Street, 111 feet on Cedar Street, and 115 on Liberty. It is about 150 feet in height, divided between eight stories.

Wood carving has become, like stained glass, such an essential in architecture that it may now be considered legitimately as one of the phases of the art.

Carvings abound which show the limits and monotony of the art rather than the varieties of which it is susceptible. For pervading expression, all details must be brought into subordination to a governing purpose. It is this manifestation and not mere manipulative skill that gives carving its true value. At the same time technical methods must be used to the utmost, and especial care taken in transitions of form—transitions which are often rough and rude to a fault, though displaying a certain kind of ingenuity.

There may be inequality in a carving and yet without blemish, as, for instance, when the objects in bold relief are highly finished, and the details somewhat sketchily worked out, but this sketchy aspect must be executed so skillfully as not to bear the appearance of slovenliness. Chopped-up execution and scattered details are to be avoided. The whole art does not consist in mere representation of objects in relief, but there is necessitated a certain unity of design which will be greatly aided by giving to each part its proper scale. As illustrating this latter point comes the following scathing English critique on a carved panel: "It represented a piece of French carving, and is a fearful and wonderful piece of art. It contains a rose which might be a cabbage; close by is a snail with a horse on his back; near the snail is a squirrel much too small, and a butterfly much too large, and, resting one foot on the roof of the snail-shell, sucking honey from a kind of fuchsia, is a bird of such strange aspect that we have no choice but to conclude that at length we are privileged to behold a portrait of the eccentric chuck itself."

It cannot be too often urged that time and skill must be employed on the composition as well as on the execution, and that but a portion of the praise due to good, artistic carving is to be accorded to the manual labor. Carving may be indulged in as an amusement, but



FRONT-ELEVATION.

Scale: $\frac{1}{4}$ of an inch to the foot.

Synagogue of the Bnai Beshurun, Madison Ave.

let the aim be to embody in the work some feature of excellence. Of various devices by which special effects may be secured, may be instanced the emphasizing, by a number of small holes, the central portion of a leaf between the two projecting lines which represent the mid-rib, and the delineation or intersecting stems by making some more depressed than others. Some carvers show a tendency to substitute angular for rounded forms, thus directing the eye rather to sharp outlines than to broad surfaces, and to unduly multiplying parts which must be rendered proportionately minute. To please in minor details wood carving should exhibit a swift touch and an easy lightness in the rendering of the details.

Excellence in wood carving does not necessarily lie in the presentation of objects in the boldest possible relief. When the art was carried to its highest perfection in France, in the reign of Henry II., there was extreme simplicity of treatment, and the finest contrasts of light and shadow were obtained without high relief.

The obstructions to travel, and the annoyance of having the sidewalk occupied with the dirt and boards, essential accompaniments to the reconstruction of a building, has been such a cause of complaint in our city where existing buildings are constantly undergoing repairs, that means have now been adopted to avoid this sort of confusion. A bank recently erected in Wall Street found it desirable to absorb into itself the entire sidewalk in its frontage; and, to accommodate the traveling hundreds who daily pass that way, a wooden structure was put up forming a second sidewalk, elevated some five feet above the natural one. Pedestrians were asked to climb a few steps to reach this made walk, and the workmen wheeled the mortar and carried their material beneath. Over the wooden walk was a substantial roof to protect passers from an accidental brick that might possibly find its way from the upper stories.

Another excellent arrangement was recently seen on Twenty-third Street, where the owner of a corner building was adding three stories to its height. An enormous wooden funnel was constructed from the first floor to the roof, running up the side of the building at its extreme rear. At the first story the funnel turned abruptly at an angle and continued out over the sidewalk to the gutter, where it terminated in a pair of steps. The height of this arm or angle from the ground was sufficient to permit people in the street passing beneath it. An elevator ran up the funnel, carrying to the roof all the materials necessary for the construction going on. By this means the street was kept clear, and the occupants of the house were saved the dust from the walk and the unsightliness of dirty heaps about the doors.

Architecture has of late received much attention from the magazines. *The Century*, not long ago, had an article upon the architectural league of this city, and has followed

that up with articles bearing more directly upon particular buildings. This month *Harper's* has the first of a series upon recent buildings in America—or rather in the United States, beginning with business houses, and presumably intending to follow it up with residences, etc.

In this connection the prevailing craze might be referred to, that has taken possession of society ladies, which is to become authoresses, and those who have the "vital spark," are making efforts to fan it into a particularly lively flame. Several have succeeded, and this paper to which I have referred, in *Harper's*, is one of that sort, being written by Mrs. Schuyler Van Rensselaer. If this craze will last long enough to accomplish any good to the young ladies, it will be a most commendable fashion.

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The illustration I sent this month is a departure from the strictly country architecture which I have made it a point to furnish for the past few months. I am induced to illustrate this synagogue for the reason that it is the very latest building put up in the city, and is destined to be very prominent from the rich congregation that is to worship in it.

The style is the Moresque and the Architect is Mr. R. Guastavino.

Improvements in Men and Machines.

It would be a curious study to ascertain how far the improvement in machines and in tools had kept pace with that in the skilled mechanic. One thing is certain, at the beginning of the inquiry, that a skilled mechanic is of just as much value to-day as ever. How much he has improved is a question for scientific examination rather than one for absolute statement. It would be a queer assertion that the men of fifty years ago were inferior to those of the present. All the facts of the past, as well as those of the present, show that our present mechanics are no more mechanics than those of half a century ago. All the great improvements in hand tools and machine tools for the last fifty years have come from the individual efforts of men who had done their work before the present advent of machine and automatic tools. These men—these workmen and inventors—made possibilities out of suggestions, and realities out of imaginings. To them belong the realities of the present machine shop.

It would seem from this that it is not the tools and the appliances that make the workmen, but the workmen who make the tools. There are just as good mechanics to-day, with all our mechanical appliances for good work, as there were when every job required a new arrangement of tools for work. In fact, the improvement in machines presupposes the capacity of the machine makers.

And yet, these improvements have their influence on the workman; the better the tool, the more exactive the workman. There are

gray-headed, almost superannuated, workmen in our shops who have voluntarily discarded all their old time notions to take up with some "new fangled trick" that has been proved to be an advance toward perfection. Every improvement in tools—induced and perfected by mechanics—tends to advance in the true mechanical improvement of the workman.—*Scientific American*.

Tin Casing to Retard Flames.

THE principal cause of the rapid spreading of flames, in modern buildings, is found in the fact that the elevator shafts furnish such perfect flues for making a strong draught. When, added to this, these openings through the floors of a building, from top to bottom, are incased with wood, alone forms the partition walls separating such a flue from the different stories, it will be readily seen that we have a surprisingly perfect arrangement for the quick spreading of a conflagration from cellar to roof. A cheap and easily obtainable means for partial protection from this danger, in buildings where the most improved construction has not been followed, would be to line the elevator shaft and the connecting doors and casing, as well as the car, with tin. This would not, of course, make these openings proof against the action of a fire which has been some time in progress, where the accumulated heat would be like that of a furnace, but it would interpose a measure of protection which would effectually check a fire in its initial stages, and prevent the sudden flashing into a blaze, through this channel, of all the floors at a time of a great store or warehouse. This is a precaution which may be taken with so little trouble and expense that it is worth the consideration of every owner or occupant of a building where the elevator shaft is of the old style of combustible construction.

The Lost Rivers of Idaho.

ONE of the most singular features in the scenery of the Territory of Idaho is the occurrence of dark, rocky chasms, into which large streams and creeks suddenly disappear and are never more seen. These fissures are old lava channels produced by the outside of the molten mass cooling and forming a tube, which, on the fiery stream becoming exhausted, has been left empty, while the roof of the lava duct, having at some point fallen in, presents there the opening into which the river plunges and is lost. At one place along the banks of the Snake, one of these rivers reappears, gushing from a cleft high up in the basaltic walls, where it leaps, a cataract, into the torrent below.

Where this stream has its origin, or at what point it is swallowed up, is utterly unknown, though it is believed that its sources are a long way up in the north country. Besides becoming the channels of living streams, these lava conduits are frequently found impacted with ice masses which never entirely melt.

A Brick Tenement House.

SAN FRANCISCO can justly be termed blessed in not having within its limits a brick tenement house; but as we have received repeated inquiries for a house of this description, that could be erected in the "fire limits" and not conflict with the "fire ordinances," we present the accompanying elevation and plans of a building suitable to those who desire to live in "flats" and yet reside in the business portion of the city. They were prepared expressly for this Journal by W. Claude Frederick, Architect.

The elevation, though striking and presenting many features not usually found in San Francisco architecture, is not an expensive one; the arrangement of the rooms is clearly shown by the engravings and will well repay a careful study. Each floor above the first is a duplicate of that presented on page 87.

To Prevent Scratching Matches on Paint.

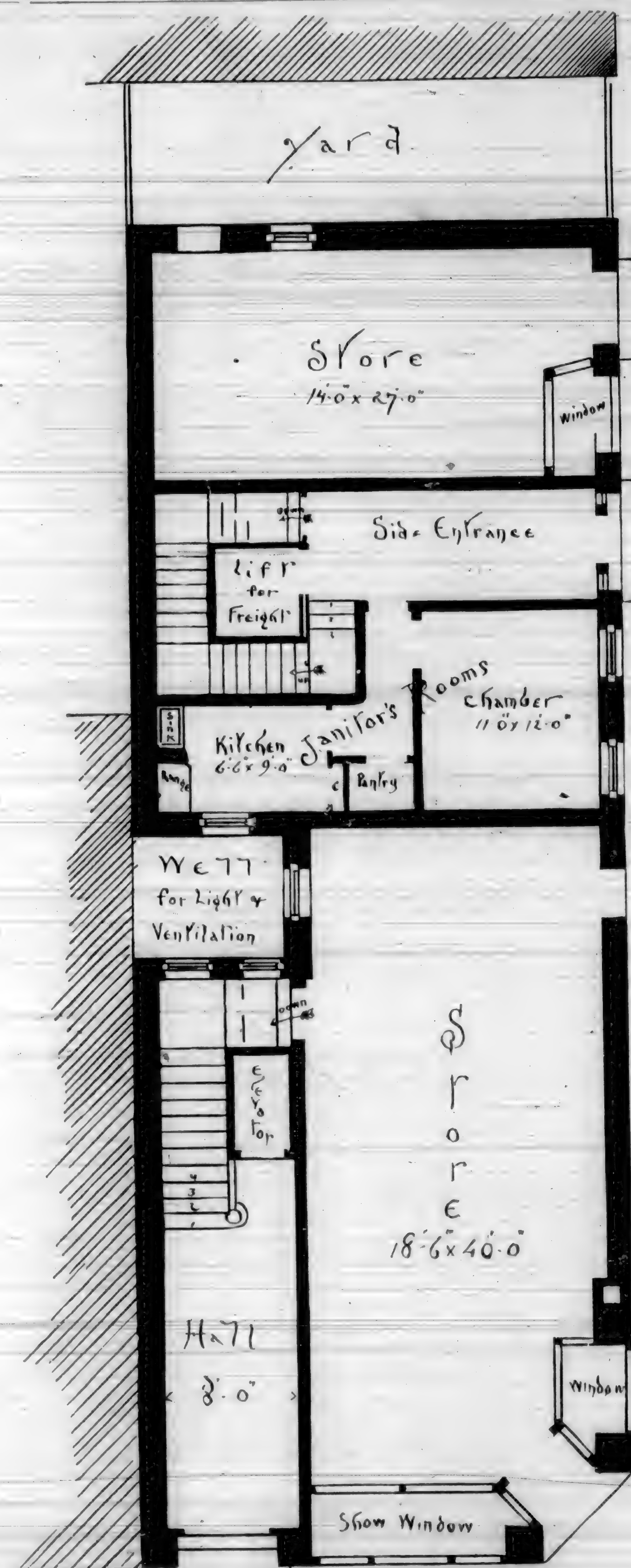
A CORRESPONDENT, in Florida, of *New Remedies*, speaking of the defacement of paint by the inadvertent or heedless scratching of matches, says that he has observed that when one mark has been made, others follow rapidly. To effectually prevent this, rub the spot with flannel saturated with any liquid vaseline. "After that, people may try to strike their matches there as much as they like, they will neither get a light nor injure the paint," and, most singular, the petroleum causes the existing mark to disappear, at least when it occurs on dark paint.

How Carpet Tacks are Made.

THE iron is received from the rolling mills in sheets from 3 in. to 12 in. wide, and from 3 ft. to 9 ft. in length, the thickness varying, according to the kind of work into which it is to be made, from 1/16th to 1/32nd of an inch. These sheets are all cut in about 30 in. pieces and, by immersion in acid, cleaned of the hard outside flinty scale. They are then chopped into strips of a width corresponding to the length of the nail or tack required. Supposing the tack to be cut is an 8-oz. carpet tack, the strip of the iron, as chopped and ready for the machine, would be about 11-16ths of an inch wide and 30 in. long. This piece is placed firmly in the feeding apparatus, and by this arrangement carried between the knives of the machine. At each revolution of the balance-wheel the knives cut off a small piece from the end of this plate. The piece cut off is pointed at one end, and square for forming the head at the other. It is then carried between two dies by the action of the knives, and these dies, coming together, form the body of the tack under the head. Enough of the iron projects beyond the face of the dies to form the head, and while held firmly by them, a lever strikes this projecting piece into a round head. This, as we have said before, is all done during one revolution of the wheel, and the knives, as soon as the tack drops from the machine, are ready to cut off another piece.



ELEVATION OF BRICK TENEMENT HOUSE.—W. CLAUDE FREDERICK, ARCHITECT.



FIRST FLOOR PLAN OF BRICK TENEMENT HOUSE.

Architectural Competitions.

THE subject of competitive plan making, which, in nearly all cases, means obtaining men's services without an equivalent, is being very freely ventilated and discussed in all journals and publications issued in architectural interests, throughout America, England and other countries, with ninety-nine per cent. of all that has more recently appeared in print, strongly condemnatory and in opposition to the methods practiced, under the delusive and misleading pretext of competition, by which State, county, and municipal governments, corporate institutions, associations, and sometimes private individuals obtain and secure the results of the labor, skill and coin of architects without compensation.

The many wrongs inflicted upon the profession as a whole, and upon its more worthy and competent members individually, through the *modus operandi* of competitions, have grown to such magnitude, and become so unmistakably the means through which gross injustice in nearly all cases is practiced, that the feeling and sentiment among the more intelligent and honorable in the profession is decidedly and emphatically opposed to the disreputable method of competitions as practiced—particularly during the past decade.

Some, and by far too many of the "Set up's" have been shrewdly-managed affairs, so disguised by finely-worded conditions and pretenses as to deceive and mislead silly men in the profession, into an expenditure of effort, time, labor and expense, while, in fact, the chances of success have been ninety-five per cent. in favor of some certain party enjoying the decidedly large prestige of being the party preferred by those managing affairs.

In England, a movement is on foot under the auspices of the Royal Institute of British Architects, the object of which is to obtain the signatures of all practitioners of creditable repute, pledging themselves not to participate in any competition not subject to the arbitration of disinterested professionals, recognized as qualified to adjudge the intrinsic merits of the plans submitted, and enjoying a good reputation as to moral integrity.

We are right glad to learn that the architects of England have taken so decided a stand in the matter, and only regret that the profession in our own country is so overrun with pretenders and men of mediocre professional abilities that it would be folly exemplified to express the hope that a reform in professional practices, as far as competitions are concerned, is among the reasonably near probabilities.

But this the respectable architects in California can do, especially members of the chapter,—refuse to participate in any competition, not conditioned exactly as provided in the constitution and by-laws of the organization, and such other regulations as may at any time be adopted by the local or parent chapter.

Bound Volumes California Architect, \$2.50

Modifying the Proportions of a Room.

TO MAKE a room appear higher, the plane surface of the ceiling should be decreased by the mouldings of the cornice, by panels, or, in the absence of these, by bands of color performing the same office. A vertical system of line should be adopted in mural decoration, and the mantel should be lower.

To make a room appear lower, exactly the opposite treatment should be adopted; that is, to increase the plane ceiling, adopt a horizontal system of mural decoration, with a dado and a high mantel.

To make a room appear wider, is accomplished, to a certain extent, by making it appear lower; but where this is undesirable, or where it is insufficient, the effect can be reached by adopting a mural decoration on a graduated scale of form, decreasing upward, so that two or more patterns at the top similar to those at the foot are found to occupy the same space as one at the foot, and this effect can be much increased by a gradation of color upward from dark to light.

To make a room appear narrower is accomplished, to a certain extent, by making it appear higher; but where this is undesirable or insufficient, the effect can be obtained by adopting a strongly-drawn large pattern in strong color for mural decoration.

To make a room appear longer is to an extent accomplished by making it appear lower and narrower; but where these are undesirable or insufficient, the effect may be obtained by decreasing the scale and strength of color of the mural decoration adopted at the ends.

To make a room appear shorter is accomplished, to an extent, by making it appear wider and higher; but the effect can be achieved by increasing the scale and strength of color of the mural decoration adopted at the ends.

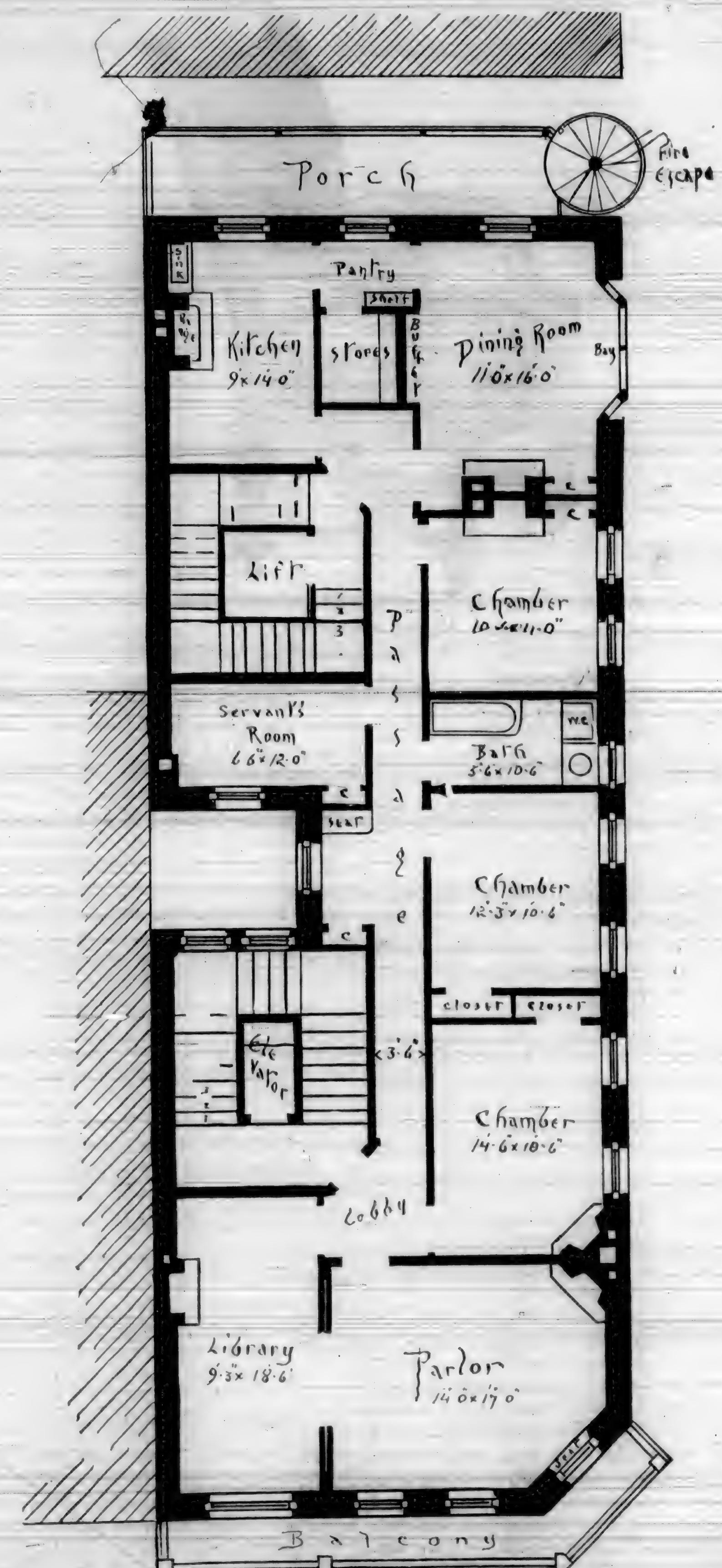
Any of these effects can be modified or increased by the treatment of the floor surface, whether by carpets, rugs, painted boards, or by parquet flooring, lines running across a room, or rugs laid down at intervals, having the effect of shortening, and consequently to an extent of heightening and widening a room. Lines running in the length increase this dimension, and to an extent reduce the height and width. A polished floor increases the apparent height of an apartment by reflecting all vertical lines and prolonging them.

"HISTORY OF ARCHITECTURE in all Countries from the Earliest Times to the Present Day." By Jas. Fergusson.

This work is one that should be in the possession of every architect. Especially should students and draughtsmen secure a copy. Being a reprint of the London edition, the price has been materially reduced. Two large volumes, containing over 1,200 pages, beautifully illustrated. Price, complete, \$15.00.

"BUILDING SUPERINTENDENCE."

This new work is of invaluable assistance to the architect and builder. It is written by a gentleman long connected with the architectural profession, and is eminently practical in its character. We will send a copy to any address upon receipt of \$4.00.



SECOND STORY PLAN OF BRICK TENEMENT HOUSE.



DESIGN FOR CHAIR.

The Pyramids.

WHY the pyramids were built is a question which has puzzled antiquarians and savants for centuries. The theory of John Taylor was that the pyramids were erected by kings who had conquered and were detested by the Egyptians, and that while the tradition of injustice in making them labor on such stupendous piles lingered on through after history, the purpose and meaning of the kings and their architects had been forgotten. Taylor believed that the Great Pyramid was designed to record in its proportions and its interior features, certain important truths of religion and science, which were not for the people then living, but for men who were to come 4,000 years or so after. And this view has been accepted by Prof. Piazza Smith, Astronomer Royal, of Scotland, whose writings have attracted a great deal of deserved attention.

But R. A. Proctor, the most popular living writer on scientific subjects, combats this theory with a great deal of learning and plausibility, in a work on "The Great Pyramid," published by R. Worthington. He maintains that the structure was essentially astronomical and astrological—the two were then virtually one—and that no explanation which does not take this element into the account can explain facts. There are many pyramids, and each belongs to a separate king; we are forced to believe that there was some special relation between the pyramid and its builder, seeing that each king wanted a pyramid of his own. The theory that they were tombs receives only a partial support, and would not account for the most important features discovered in their peculiar architecture.

Without exception, the pyramids are built on special astronomical principles. Their

square bases are built so as to have two sides lying north and south. "One can imagine no reason why a tomb should have such a position," writes Mr. Proctor; and he says: "It is not easy to understand why any building at all, except an astronomical observatory, should have such a position." And he elaborates an ingenious theory which fits remarkably well as it goes, why these wonderful structures were built as we find them.

Each king had his pyramid, and each had his horoscope cast. A succeeding king could not use the pyramid of his predecessor; it was closed up and abandoned and a new observatory begun. But no explanation yet made has rendered it at all clear to the practical modern mind why the ancient kings exhausted their subjects with the labors that were necessary to the raising of these massive mountains of stone and brick. Mr. Proctor admits that there are difficulties in the astrological theory, but they arise from our inability to understand how men ever had such fullness of faith in astrology as to devote enormous sums and many years of labor to the pursuit of astrological researches. Besides the essay on the "Great Pyramid," this volume contains short papers on the origin of the week, Saturn, and the Sabbath of the Jews, astronomy, and the Jewish festivals. The volume is rich in ingenious materials and scientific information.

STAINED GLASS WINDOWS.

Messrs. G. W. Clark & Co., 645 and 647 Market Street, have on exhibition the most beautiful and artistic designs that have as yet been shown to our people, for stained glass windows. They have secured the agency of the La Farge Decorative Art Company, and are fully prepared to furnish stained glass work of every description and in a great variety of designs. Messrs. Clark & Co., are also agents for *Lincrusta Walton*, the most beautiful material yet invented for decorative purposes.

A French Class.

Under the Auspices of the S. F. Chapter.

DURING the past month, a class in French has been organized, principally intended for Architects and students connected with the Chapter. Any one, however, can join. The terms have been placed especially low for the purpose of inducing many of the younger members of the profession, and those interested in art, to join the class.

The class will be under the direction of Madame Pietro Mezzari, a lady well known in artistic circles. The class meets every Friday evening. Parties wishing to join will please send their names and address to this office.

Books and Special Notices.

GOODELL & WATERS, of Philadelphia, have sent us their Illustrated Catalogue of Wood Working Machinery. It contains numerous engravings of every kind of machinery used for wood working purposes. We would advise those desiring to purchase anything in their line to address a note to the above firm.

THOS. KANE & Co., of Chicago, have forwarded to us a specimen sample of their wood carpeting, which we will be pleased to show to callers.

FOUNDATIONS AND "FOUNDATION WALLS" for all classes of buildings, pile driving, building stones and bricks, pier and wall construction, mortars, limes, cements, concretes, stucco, etc. Practical explanation of the various methods of building foundation walls for all kinds of buildings. Revised and enlarged edition. A copy of this work will be sent free of postage to any part of the world upon receipt of the Publisher's price, \$2.00.

We have received two new works by Wm. Paul Gerhard, entitled "Sanitary Drainage of Tenement Houses," and "House Drainage." This writer is well known as one of the most experienced, and best qualified of the sanitary experts of the present age. A copy of these works should be in the possession of every house owner, and their contents thoroughly studied.

PATENTS AND INVENTIONS.

List of U. S. Patents for Pacific Coast Inventors.

(From the official list of U. S. Patents in DEWEY & Co.'s SCIENTIFIC PRESS PATENT AGENCY, 252 Market St., S. F.)

FOR WEEK ENDING APRIL 29, 1884.

- 297,657.—CULTIVATOR—Daniel Archer, Madison, Cal.
- 297,910.—TRACK CLEARER—Ephraim B. Bishop, San Francisco, Cal.
- 297,664.—MITER BOX—William L. Boyver, San Francisco, Cal.
- 297,668.—TOBACCO SWEATER—George Brownstein, San Francisco, Cal.
- 297,594.—STRAW CARRIER FOR THRESHING MACHINES—Maximilian J. G. ssner, San Francisco, Cal.
- 297,796.—CARTRIDGE IMPLEMENT—Henry T. Hazard, Los Angeles, Cal.
- 297,698.—SAW SWAGE—Simon Kinney, San Francisco, Cal.
- 297,699.—PIN FOR ELECTRIC INSULATORS—John M. Klein, San Francisco, Cal.
- 297,714.—VEHICLE—Jacob Price, San Leandro, Cal.
- 297,857.—FIRE ESCAPE—George Sinfield, Portland, Oregon.
- 297,647.—SUBMARINE VESSEL—Josiah H. L. Tuck, San Francisco, Cal.
- 297,648.—MARINE TORPEDO—Josiah H. L. Tuck, San Francisco, Cal.
- 297,734.—WHIFFLETREE—James Whitcomb, San Jose, Cal.

NOTE.—Copies of U. S. and Foreign Patents furnished by DEWEY & Co., in the shortest time possible (by telegraph or otherwise), at the lowest rates. All patent business for Pacific coast inventors transacted with perfect security and in the shortest possible time.

A Summer Resort Cottage.

THE accompanying illustrations represent a design for a comfortably arranged cottage to be built at a seaside or summer resort. Economy, with ample accommodations, are the main features. All the partitions are made of inch boards. The front is covered with rustic, which may be extended around the building, depending altogether upon the amount of money one wishes to expend. The rooms are very convenient and large enough for the purposes intended. The dining hall, with its cheerful fireplace, may also be used for a general meeting room in the evening.

The plan is admirably adapted for places like Pacific Grove and was prepared especially for the consideration of parties desiring to locate in that beautiful place.

We are indebted for the plans to W. Claude Frederick, Architect.

Album of Mantels.

A NEW work, containing designs for every description of mantels. Price, \$8.00.



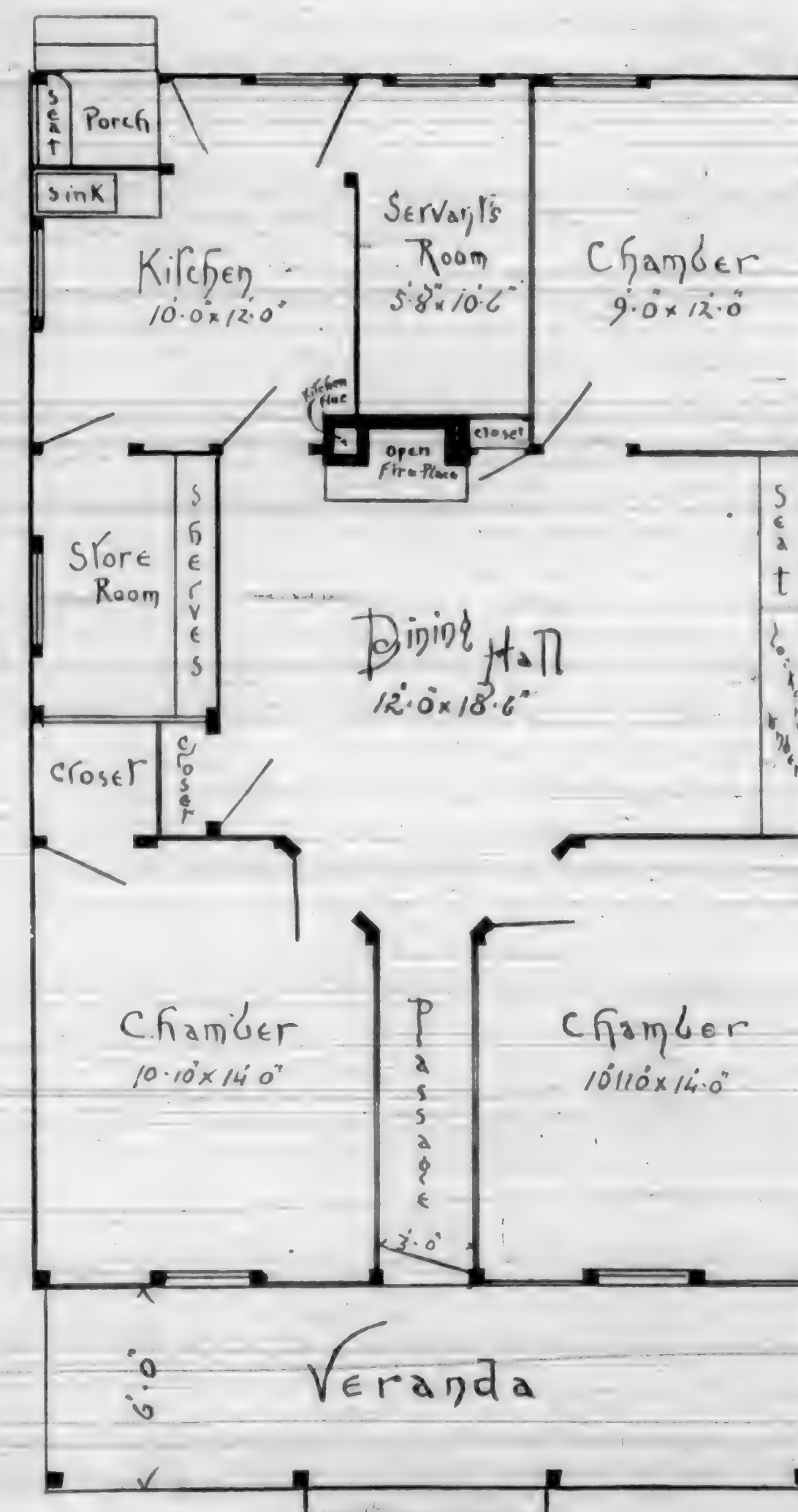
DESIGN FOR A SUMMER RESORT COTTAGE.

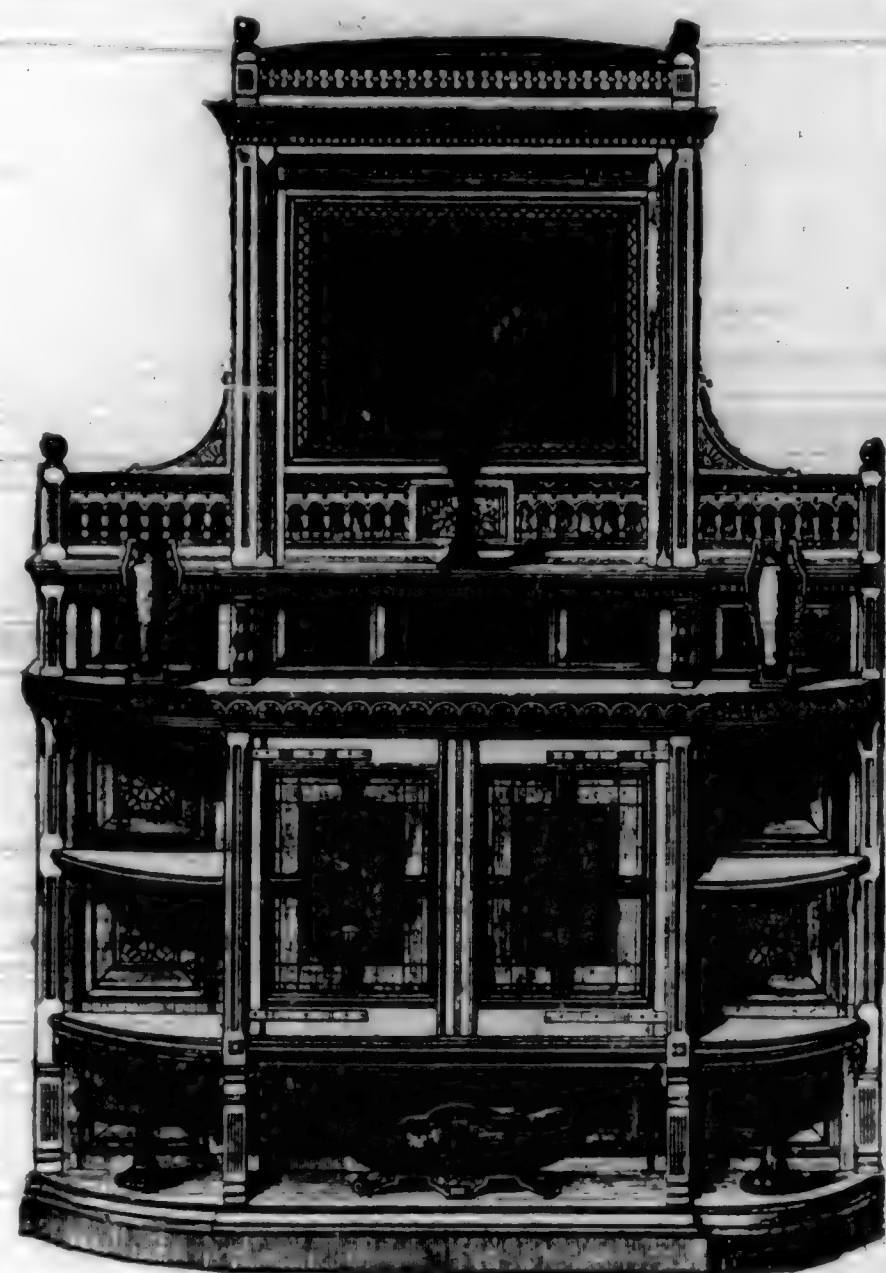
Work—for a Home.

THERE are two important steps to be taken by every young man who has to depend upon his own exertions for a living. The first is to master some occupation which he can rely upon in after life for a livelihood. The three or four years spent in learning a trade are to most young men years of privation, during which they are compelled to exercise the most rigid economy. The lessons taught during these years, if properly applied, will render the next step—the procurement of a home—comparatively easy of accomplishment. A wage worker, in the possession of a good trade and a comfortable house to live in, is on the highway to competency.

The greatest obstacle to the steady advancement and prosperity of the mechanic is the constant drain which the landlord makes upon his income. It is plain, therefore, that the first step toward independence is for the mechanic to own his own house. If he has to pay out in rents every ten years as much money as would secure for him a comfortable home, there is but a slim chance of his ever accumulating much money. Once a wage worker becomes his own landlord, he can save a sum annually at least equal to what his rent would be, and this continued for a period of years must result in a competency if a judicious use is made of the money. It may not be possible for all mechanics to obtain homes of their own, but thousands who continue to be renters all their lives could do so if they would only make an effort. It requires some degree of self-denial to accomplish the result, but once obtained it removes the chief obstacle to those steady accumulations which are the foundations of all fortunes, great and small.

Detail Cottage and Constructive Architecture, Price \$10.00.





HANDSOME DESIGN FOR A CABINET.

Unhealthy.

[Special Eastern Correspondence of the CALIFORNIA ARCHITECT.]

IN a series of articles prepared from actual laboratory data, we shall strive to show plainly, first, the wanton ignorance in the home; second, the superfluity of physicians and their gross inefficiency; and, lastly, the comparatively few occupants of graves who were not murderers or suicides, perhaps both. In making these tests, and in the preparation and presentation of resulting facts, we have only consulted what the spectroscope, microscope, chemistry, and physical laws have revealed, having no desire to array ourself in an antagonistic manner with any trade or profession in life. To the contrary, we take this manner of inviting the co-operation of all, in order that, when completed, it may be truly said of them, 'tis finished, and wiser are we.

Late in the autumn of 1883, one of the most beautiful, and enterprising cities on the Ohio River found itself in the embrace of an epidemic, the nature of which baffled all available medical talent. Expert architects and engineers were unable to agree concerning its cause, but unanimously urged a rigorous cleaning up and thorough fumigation of all the infected wards which comprised the most popular and aristocratic in the city, but all of no avail. The disease spread, carrying death before it, until scarcely a house in the entire square but wept over the vacant chair. To be sure the physicians all theorized, nevertheless they failed to arrest its progress.

When the epidemic had begun to subside, the municipal authorities seemed to have awakened from their lethargy and set about investigating, manifesting a willingness to assist, financially, all who reached results that appeared reasonable. Of course chemists were

on hand in numbers, with their appliances for examining liquids, gases and solids as a means of reaching some conclusion. The water supply furnished from a rapidly running stream by the Holly system was found good and pure in the ordinary acceptance of the term, but a close inquiry revealed the fact that localities the most afflicted with the epidemic—a sort of low form of typhus fever—were supplied largely from private sources. These being analyzed, unmistakable evidences of uric acid and dumb bell crystals were found, though the wells were well kept, free from filth, and far removed from all apparent opportunities for contamination, still this extraneous matter was present and necessarily had an origin somewhere.

Before proceeding farther, it will be best to describe the situation of the place. The city is situated on a very high point, built substantially, mostly of brick and stone. In or near the center is the Court House and public park, occupying an entire square, which is surrounded by a beautiful and high iron fence, between which and the street is a stone pavement, it being, as it were, fenced in with heavy railing, to which the farmers, traders, hucksters, etc., fastened and fed their teams, which at the time of our first visit, was lined closely all the way round with a medley of teams. The gutter, substantially laid with granite and cement, made perfect drainage for all liquids deposited, while once or twice per week the jailor and the prisoners scraped all solids, etc., and washed them down the gutter, which conducted them to the river, below the filter from which the city's water supply is obtained. Apparently, here was a perfect system of drainage, for where the surface drain or gutter entered the river, the stream contained high banks and run in the form of a current, the city occupying the inner or concave side. We have been thus explicit in our description that all may appreciate fully the situation to be discussed further on.

In the spring preceding the outbreak of the epidemic, the county had given the contract for erecting a bridge across the river at the lower end of town, and the city awarded the contractor the privilege of making coffer-dams for laying pier foundations, but to make the expense of hauling stone, iron and all heavy material less, this contractor made a dam from the inner shore, nearly three-fourths across the stream. On the top of this was a roadway or pike.

By tracing carefully, by the aid of microscopic chemistry, we found that the dam had furnished a different current for the river, and all along the right bank the water was stationary above where the gutter from the square had a termination. A large factory had been erected on a low, marshy tract adjacent, and procured its water supply from shallow driven wells. This tended to drain off the stagnant water, when this backwater from the river found ample space to accommodate the slightest raise.

From this low section the water gradually

seeped and eventually found its way into the wells, the water from which poisoned scores. Thus we found direct communication well established between the Augean Stables at the square of the Court House to the wells of the citizens.

(To be Continued.)

Painting

PAINTING is one of the many things that an architect is expected by his client to be thoroughly posted on, and certainly for his own comfort he should be. Yet how many architects are there who understand the matter? It is easy enough to specify "two-coat" or "three-coat" work, and to remember what parts of the building it is best to have treated in one way or the other; and to superintend the painting, so far as to make sure that wood is primed only when thoroughly dry; that it is properly rubbed down and filled is also comparatively easy, but to superintend the mixing of the paints, to be able to detect and condemn inferior and adulterated oils, to be sure that the lead is not mainly barytes, to be able to take the paddle yourself, and by a real knowledge of the properties of pigments to mix a tint that you desire to obtain, to know what of the many brands of "ready-made" paint it is allowable to use,—these are attainments that the architect rarely has. Yet he should have them. He should know what varnishes will crawl and crack, and what will stand; he should know about stains, about wax and oil polishes, metallic paints, shellac, and the infinite variety of pigments. And we believe that some day he will find it well for him to know these things with a scientific if not a practical knowledge, and not leave them as now entirely to the honesty and intelligence of the painter's foreman, just as now he knows more about plumbing than the architect of ten years ago ever dreamed of knowing.—*Am. Architect and Builder.*

SAWDUST, as an ingredient of mortar for house plastering, is commanding considerable attention in certain directions. It is used in place of sand. It is claimed that such mortar is more porous than the ordinary kind, consequently the face of a wall composed of it is warmer; that it is a non-conductor of sound and dampness; that it overcomes the echo in churches and halls. In the manufacture of the mortar a glutinous substance is used, which sticks it firmly to the wall.—*The Lumberman.*

SACK'S AUTOMATIC SELF-DISCHARGING WATER CLOSET.

We would call particular attention to this New Water Closet, now being introduced in this city by Mr. Wm. E. Stevens. Its merits are fully set forth in his statement and card on Page IX, to which we will refer those interested. It is the only self-discharging closet now in the market, and its simplicity and non-liability to get out of repair, warrant its general adoption by every architect, property owner, plumber, etc. They can be seen in successful operation at Mr. Stevens's place of business, Market cor. Larkin.

Steel Square and its Uses..... \$1.00

John M. Curtis.

GENERALLY those who are most successful in this world are the ones that, being left alone in the very early stages of life, with no parents to watch and guide their course, yet struggle manfully along, and develop the talents given to them by the Great Architect above.

Mr Curtis was left an orphan when very young, and his guardianship was assumed by Wm. T. Coleman, of this city; to this gentleman does he owe much of his success as a builder, and, later, as an architect. The principles instilled by Mr. Coleman into Mr. Curtis' mind, were those that taught the man to be independent and to take care of one's self by persevering industry and thus earning success.

Early manifesting an inclination to handling carpenter's tools, Mr. C. was apprenticed with Messrs. Burt & Son, of St. Louis, at that time one of the prominent contracting firms of that city. Upon the completion of his article time, he entered the office of Mitchell & Brady, architects, in the same place, and remained over five years in their employ.

California presenting unusual inducements to men of energy, Mr. Curtis started for San Francisco; shortly after his arrival, he was employed by E. J. Baldwin as assistant architect of his magnificent hotel and theater, remaining in that capacity until the entire building was finished.

Feeling that a more extended practical knowledge of carpentry was necessary in order to thoroughly master all the intricacies of his future profession, Mr. Curtis again entered the lists of contractors in this city. Several fine dwellings were built under his direction, some of which were under the immediate superintendence of the senior editor of this journal.

After an extensive experience in the building line, we find Mr. Curtis again resuming his practice as a professional architect. Among his first clients, was his former guardian, whose offices he designed, and which are among the nicest fitted up in the State. All the principal street decorations used during the Triennial Conclave, were designed and erected under the supervision of Mr. Curtis.

Business increasing, Mr. Curtis associated himself with A. A. Bennett, and located his offices in the German Bank Building, 528 California Street. These gentlemen have now under construction the Sonoma County Court House, at Santa Rosa, the Humboldt County Court House, at Eureka, the University of Southern

California, at Los Angeles, and several private dwellings.

Mr. Curtis is also, at present, supervising architect of the new City Hall. He is a member of the S. F. Chapter American Institute of Architects and is prominently identified with several Fraternal Associations.

The Liability of Contractors.

A RECENT decision of the Supreme Court of Nebraska is of special interest to builders. S sued B for \$492.60, the balance due him for building a two-story brick house, and B made a counter claim for defective material thrown out and money expended in repairing the unskillful work of S. The contract price was

workmen.' The question is not one of skill on the part of the contractor, but of compliance with the contract." If a contractor agrees to erect a building in a certain manner, he must comply with the agreement, and no plea of a lack of skill, of himself or any of his workmen or sub-contractors, will constitute a defense for a failure to comply with the contract.—*Building.*

Gas Leakages.

AN indicator of gas leakages has been constructed by Mons. C. V. Jhan, and is described in the *Revue Industrielle*. The apparatus consists of a vessel of porous earthenware, such as the porous cell of a galvanic battery, set upside down, and closed by a perforated India rubber stopper. Through the hole in the stopper, the inside of the vessel is connected with a pressure gauge containing a little colored water. The vessel can be exposed to the air of an apartment where a leak of gas is suspected; or a sample of the air may be contained in a bell glass inverted over the porous cell. The diffusion of gas through the earthenware raises the level of the water in the pressure gauge; and when the latter is properly graduated and proportioned to the capacity of the cell, exact and delicate indications may be obtained in a simple manner. This species of diffusometer is so sensitive that when an Argand burner is gradually turned down until it is extinguished, the instrument, if held above the burner, will show a considerable rise of the water in four or five seconds. If held over an ordinary burner, turned on just sufficiently to be ignited, the liquid rises very rapidly. When the instrument is graduated in millimeters, a volume of one-half per cent. of gas in a room

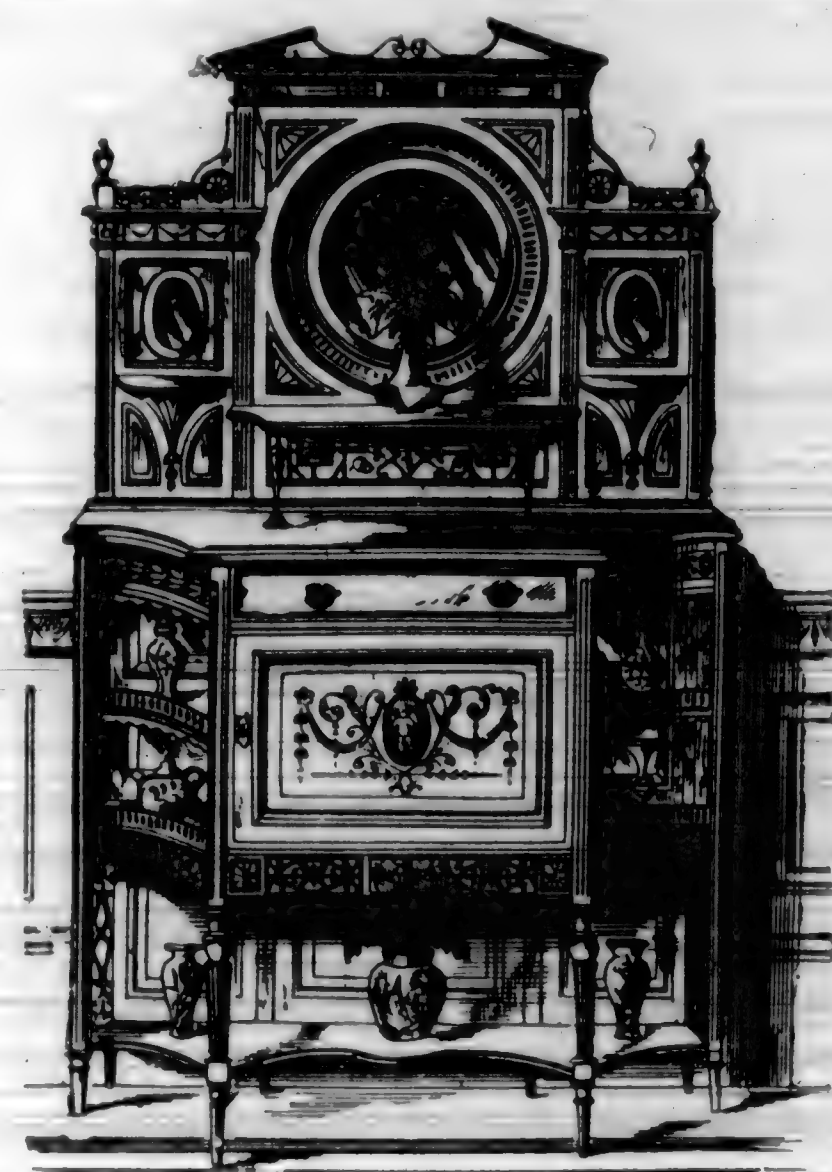


CAL. ELEC. ENG. CO.

JOHN M. CURTIS.

\$2,535, and the plaintiff paid \$2,042.40; the counter claim was \$1,985, for which the defendant got judgment. The defense to the counter claim was a most novel one, viz.: that the defendant had "no experience in laying foundations, as the defendants knew." The case, *Sherman vs. Bates*, was carried to the Supreme Court, where the judgment was affirmed. Judge Maxwell, in the opinion, said: "A party entering into a contract to construct a building thereby agrees that all parts of the structure shall be put up according to the agreement. As a defense to inferior workmanship, he cannot say: 'I am not a mason, or carpenter, or tinsmith; therefore I am not liable for defects caused by unskillful or careless

may be distinguished by it. An example is afforded by a case of sickness, which, in the opinion of the medical attendant, was due to gas poisoning. Some doubt arose on the point, because gas was not laid on to the house. The diffusometer was brought into requisition, and showed the presence of gas, the source of which was afterward found in a broken main three meters distant from the house. A modification of the same instrument is made, whereby the sensitive portion is adapted for permanent exposure in any place difficult of access—such as the ceiling of a theater or public building, where gas might be expected to collect, the indicating portion being fixed anywhere within view.



NEW DESIGN FOR CABINET.

The Reliability of Ready Mixed Paints

THE question of the reliability or durability of ready mixed paints continues to be one of the most interesting and perplexing ones connected with the trade. Shall the oft-repeated statement, "Ready prepared paints are not to be depended upon with that degree of certainty which good work demands," be taken as an accepted truth, not admitting discussion, or, on the other hand, shall the decision be reached that there are honest, ready-prepared colors, and that the question of the responsibility of the manufacturer should determine where they be purchased?

The value or durability of a color depends upon the vehicles used in mixing the paints, and when, through downright dishonesty, or the demands of a too strong competition, artificial pigments are used, an unreliable product is the result, and the prejudice existing among so large a class of painters against the use of ready-mixed paints is strengthened. When this is so strong that it is almost impossible to induce painters to make use of ready-mixed paints at all, surely it must be conceded that there are some good reasons back of this prejudice.

One old painter says: "I have always and still entertain prejudice against the mass of ready-mixed colors and paints turned out by grinders and manufacturers. My objections are that we cannot safely rely upon their quality or even the honesty with which they are compounded—so many different substances are called by the same name. We find ochres, for instance, in the market, which have little, if any, of the natural pigments in them; many of them are artificial products. The same with umbers, carmines, vermilion, in fact, with nearly all our colors and pigments that it will pay to imitate."

A strong argument many painters bring forward in favor of mixing their paints is

that these imitations and frauds can more readily be detected in the crude materials than in the prepared paint or color. While this is true, it is also the fact that the painter who mixes and grinds his own colors can very easily be, and very frequently is, imposed upon by adulterations, artificial pigments, etc.

It is an admitted fact among the best class of painters that where the skill and honesty of the large manufacturer can be relied upon, the latter can better secure uniformity of quality and color. Experts in the mixing and application of paints—men thoroughly understanding the chemical relations of the colors being handled and with a large amount of material to select from—must certainly be able to secure a more uniform result, both as to quality and tone of color, than the ordinary painter in his shop, with few facilities for the work on hand, and a limited stock from which to select.

Again, a greater degree of durability can be obtained by the large manufacturer who is at the same time honest in his manipulations. The permanence of colors in secondary or mixed paints depends primarily in the chemical relations of the colors and pigments employed. These secondary or mixed colors are produced by various combinations, and the rule is to use the least number of colors possible to secure the desired tint. Where the greatest skill is displayed in these chemical manipulations, and where there is the widest choice of material, naturally seem to be the place where the greatest durability in the mixed paint could be secured.

Then there is the question of economy. Granted the honesty of the large manufacturer, with his superior facilities, advantages for purchasing the crude material, etc., is it not reasonable that the cost of manufacture should be much lower than where the opposite is the case? The large manufacturer buys his own materials and thus becomes responsible for their quality, while the painter mixes and combines materials purchased by another party, and the quality of which material he is ignorant of, except so far as a careful examination and his own chemical knowledge go to inform him.

The whole question seems to us to resolve itself down to this: Those who purchase only standard ready-mixed paints manufactured by well-known and responsible concerns, will get honest goods, and those who pursue the opposite course will get the adulterated and fraudulent goods. While there are unprincipled manufacturers, it is not really a difficult matter to find the reliable and honest ones. A good reputation for honestly-compounded paints and colors is built upon a solid foundation, and is not recklessly hazarded by the fortunate possessor. Even the severest competition of his dishonest rivals who undersell him, and promise just as good or better goods than he manufactures, will not drive him into the compounding of adulterated goods.—*The Painter.*

The Trade in Modern Antiquities.

ONE of the chief delights of Continental travel, as every person of experience will admit, is the unlimited opportunities it affords for buying antiquities. The statuary, the coins, and pictures that may be purchased in Italy are a source of never failing interest to English travelers and of never failing profit to Italian dealers. Andalusia, again, is a huge curiosity shop. Being once upon a time in Seville, we came across a retired British grocer, or tailor, or something of that kind, who had just purchased a "Madonna and Child"—unhappily, unsigned—which he had picked up for a few pounds in a dingy back street. He was going to send it to the Exhibition of Old Masters, and, if he ever did so, he probably found that it was worth only a pound or thirty shillings at the outside. It is the same, indeed, throughout Spain.

The altar cloths, the broken fans, the inlaid tables and cabinets, as resplendent as anything in the convent of the Cartufe at Granada, the wonderful chairs and the still more extraordinary scraps of ancient lace, upon which all who have ever traveled in Spain have spent much money—these abound from Malaga to Irun, and naturally one is inclined to speculate a little on the odd circumstance that the supply is more abundant than ever, although the demand is fairly brisk.

Tangiers is, we should say, a hotbed of modern antiquities, and even Mr. Chamberlain bought some of them when he was over there a year or so ago. He ought to have known something about this class of goods, being a Birmingham man, but the childlike faith of the president of the Board of Trade in all things ancient is notorious. America, oddly enough, has taken to this business of manufacturing the antique Dutch cabinets, that, with bronze panels, dingy and marked with the cracks of fictitious centuries, are turned out every day from Chicago furniture stores, and for some purposes they are quite as useful as if they had indeed belonged to some departed burgher in the dead cities of the Zuyder-Zee.

New York experts in this sort of forgery make a specialty of Queen Anne chairs and tables, and the imitation is so perfect as to deceive all but those who have studied such things minutely in Europe. The explorer of furniture stores may come upon magnificent specimens of English Gothic chamber pieces, or ancient-looking Chippendale and Sheraton chairs, which might have belonged to Queen Elizabeth but for the fact that they did not.

It must be puzzling at first to discover in New York shops stamped leather chairs of the time of Louis Treize, plentifully ornamented with brass nails, whose heads are fully an inch in diameter, and the citizens of that enterprising city are invited to become the happy possessors of as many of these treasures as they like on ridiculously low terms. If, however, the explorer is inquisitive, and the furniture venders are in a tolerably can-

did mood, the visitor may be conducted into some back yard where these gems of high art are produced.

A Queen Anne's chair, just made, can, for instance, be supplied with worm holes by the simple process of tilting it bottom-side up and firing a charge of pigeon shot into the bottom and front of the seat.

Old armor, too, is a good line in this business, the drawings required for the purpose being made from the collection in the Grand Opera House, in Paris. It is said that Birmingham knows something about this branch of the trade, and that helmets, shields, casques, breastplates, and complete suits of mail are regularly manufactured for the gratification of credulous oil speculators and retired pill manufacturers. If a man starts a lot of ancestors he likes to have dummies of them in his hall rigged in their medieval iron-monogery. If Birmingham did not gratify him, Germany would.

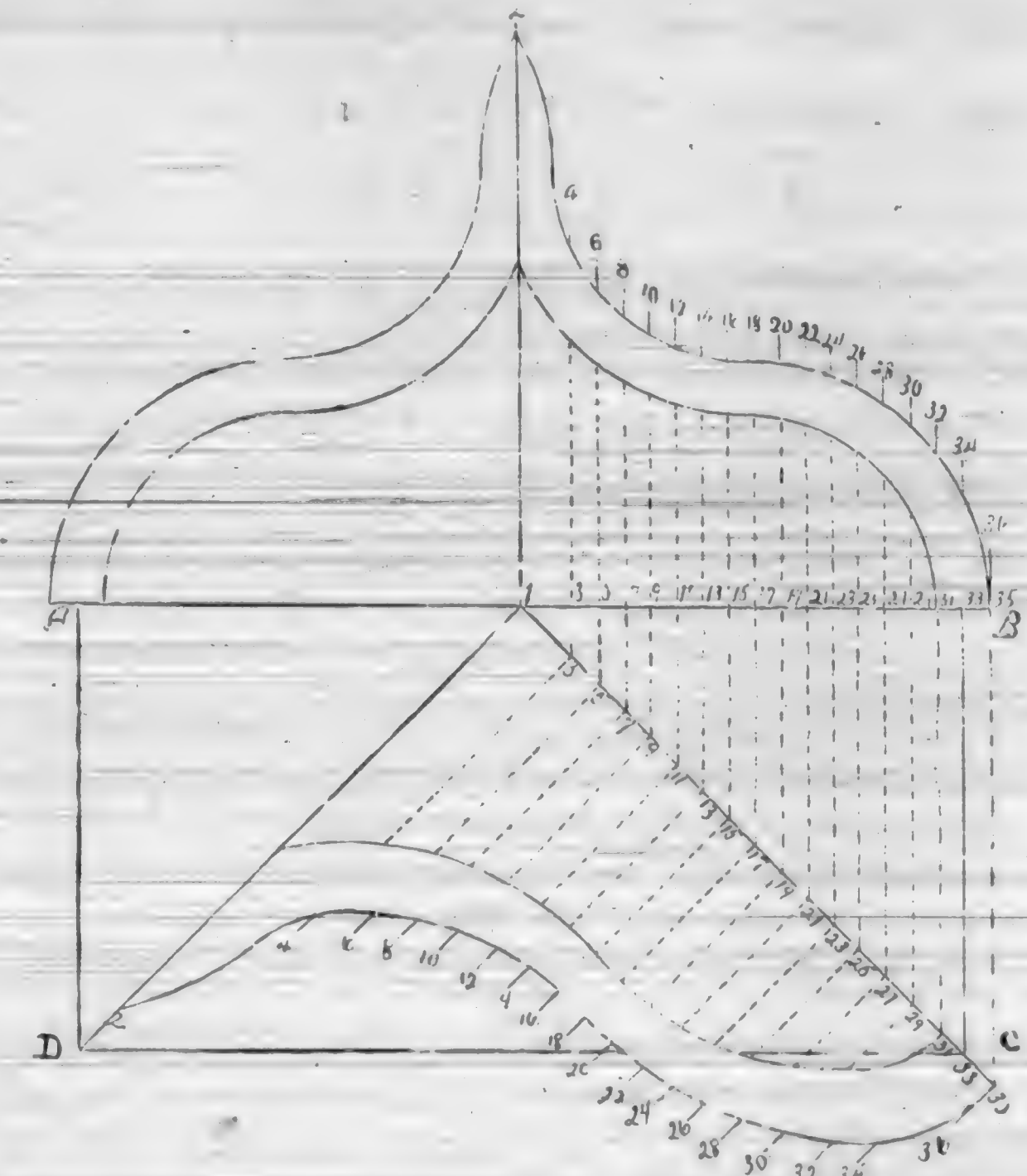
It is astonishing how many tons of antiquities are annually sold along the Rhine, and it is even asserted that in Castle Colburg, where Martin Luther threw his inkstand at the devil—and unhappily missed him—the original splash was cut up and sold long ago; but that as the timber is massive, the place is carefully re-inked every night for the purpose of sale the next day. We cannot say how much truth or falsehood there may be in this particular story. There might have been some excitement in seeing the original transaction if both the distinguished parties to it were present. There can be none in gazing on a patch of ink. The trade in modern antiquities, however, is a curious reality, as real as the sale of old clothes or tombstones. It is a fact calculated to weaken one's faith in life.—*Ex.*

Color.

TO THE house painter who is ruled largely by the restrictions of a customer as to choice of colors and quality of material, and, it may be, by prevailing customs of decoration also, the study of color does not seem a great necessity. To put paint of some sort where it will prevent decay has been his chief duty; what the color was, or what the effect it would produce, seemed less important.

In the calling of the painter, aside from its conventionalities and bread-earning purposes, there is an ample field for his genius, if he have it, or for any talent he may possess. Between black, the one extreme of color, and white, its other extreme, there is a long stretch of varied and beautiful landscape, which can be made more beautiful by careful cultivation, or uglier by neglect and distortion. In order to its proper cultivation, the painter must acquaint himself with the qualities of color, the variations to which it is susceptible, its expressive power, and its proper relationships by harmony and contrast.

That color can speak to the artistic eye is



RULE APPLYING TO THE CURVED RIBS OF BAY WINDOWS.

a fact well known. That it too often tells a tale of the ill treatment to which it has been subjected quite as pitiful, and probably more truthful, than the street beggar, is also true, and that underskillful manipulation it reveals its power, unequaled to charm and to instruct, is beyond question.

What variations lie between black and white, and what the proper relations of these variations are, nature teaches; for they all are found in the golden glory of the sunset, in the somberness and majesty of the storm, in the endless variety and beauty of vegetation, in the grey, purple and brown of rock, hill and mountain, and in the soft tint of untainted water. Watch the play of light in nature's work, drink copiously at this unfailing source of knowledge, and lessons in the use of color may be learned which will greatly improve present tastes with regard to decoration.

The expressiveness, the sympathy, the contrasting beauty which can be got out of color for house decoration, should be drawn out by the painter and applied so that none of our buildings would be ugly in appearance, or inharmonious with surroundings. Study and persevering practice will accomplish this, and it will prove a source of intellectual and pecuniary profit to those who become masters of the art.—*The Painter.*

GAS FITTERS' CEMENT.—Melt together four and one-half parts of resin (by weight), one part beeswax, then stir in three parts of Venetian Red, and pour into moulds made of oiled paper, or cold iron moulds.

Explanation of Above Diagram.

A B C D shows ground plan. A B 2 elevation of common rafter. 1 C to be the seat line of hip. Square from seat line C 1 out to D; space the curve 2 B into as many parts of parts, the more, the more accurate. Let fall from the numbers on the curved line perpendicular to the numbers on the seat line C 1. Square from the numbers on seat line 1 C commence and transfer from seat line 1 B in their respective places, to corresponding places on seat line of hip 1 C by those transfers. These are found to trace curve theory. Cut and stand up as shown. Of all the cuts that are a source of annoyance to carpenters, the above is one that to many is most difficult of mastering.

The rule applies to the curved ribs of bay windows, also to roofs that curve both ways. Ribs for arbors also apply to roof of octagonal ground plans. M. J. MARION.

Science of Carpentry Made Easy.

A WORK that should be in the possession of every mechanic, as its pages are full of practical, instructive matter pertaining to carpentry, bridge building, etc. Price, \$5.00.

How to Build, Furnish and Decorate.

SIX HUNDRED and fifty illustrations, consisting of plans for every kind of a building. A PERFECTLY NEW WORK. PRICE, \$10.00.

Indexed Atlas of the World.

BUT one copy left. Price, \$30.00.

Stained Floors.

THE popularity of stained floors goes on increasing. Nowhere are they more appreciated than in sleeping-rooms, where sweetness and freshness are the main considerations. Just what is the best stain is a difficult question to decide. A writer in the London *Queen* is of opinion that permanganate of potash is the best. It is much used in the navy, and is very satisfactory in sitting-rooms and sleeping-rooms. As most people know, permanganate of potash not only stains, but purifies and disinfects the rooms which are stained. The mode of procedure is this: Procure a good quality of permanganate of potash; dissolve about an ounce and a half of the crystals in a gallon of boiling water—this will make quite a dark stain—use a stick to stir up the mixture; then with a painter's flat brush lay on the stain, working the way of the grain of the wood quickly and boldly. A small brush is useful for corners and crevices, and a pair of heavy gloves should be worn while at work, as the permanganate stains very considerably. Salts of lemon or the lemon juice will, however, quickly remove the stains from the hands. When dry the staining can be repeated if the color is not dark enough, and then when perfectly dry the floor should be rubbed dry with an old duster, and linseed oil should be rubbed on freely with a piece of flannel, always applying it with the grain of the wood. Two or three layers of the oil are an improvement, and firmly set the stain. The floor is then ready to be polished with beeswax and turpentine. To prepare this, spread or cut up the wax into small pieces; put it in a gallipot, and pour sufficient spirits of turpentine over it to just cover it; set the pot in the oven or on the stove until the wax is thoroughly melted, then set it aside to get cold, when it should be of the consistency of pomatum. Put on the wax—not too much of it—with a piece of flannel, and polish with a polishing brush or a big silk duster. This mode of treating floors is quite the best and most wholesome for bedrooms, which should be stained all over, under the beds and everywhere. They can be kept very clean and bright by a daily rubbing with the duster and a weekly application of beeswax and turpentine. Turpentine is cleansing, and floors so treated do not require the weekly scrubbing which is so objectionable in cold and wet weather. Some people object that these floors require so much labor; but after they are once well polished, the labor is not more than scrubbing floors and washing oilcloths, and they take away two-thirds of the terrors of house cleaning. Those who like the more common varnished floors should stain the floors as above, but instead of the linseed oil a coat of size should be laid on. This can be obtained at the paint shops, and should be dissolved in boiling water to the consistency of thin gum, and then laid on with the brush evenly and with the grain. When the size is perfectly dry and hard it can be varnished with one or two coats of

copal or egg-shell flat varnish. These floors require to be dusted daily and to have a little linseed oil rubbed in occasionally. These require less care than a waxed floor, but when they get shabby they are not so easily renovated. A flannel bag in which the broom can be encased is the best floor duster and one most easily managed. — *Set.*

The Manufacture of Glue.

GLUE is an inspissated jelly, made of the parings of hides and horns of any kind, the pelts obtained from furriers, the hoofs and ears of horses, oxen, calves, sheep, etc. These are first digested in lime water, to cleanse them from grease or dirt; they are then steeped in clean water with frequent stirring, afterwards laid in a heap and the water pressed out. They are then boiled in a large cauldron with clean water, skimming off the dirt as it rises, and further cleansed by putting in, after the whole is dissolved, a little melted alum or finely powdered lime. The skimming is continued for some time, after which the mass is strained through baskets, and suffered to settle, that the remaining impurities may subside. It is then poured into the kettle again, and further evaporated by boiling and skimming till it becomes of a clear darkish brown color. When it is thought to be strong enough, it is poured into frames or moulds about six feet long, one broad and two deep, where it gradually hardens as it cools, and is cut out when cold into square cakes. Each of these is placed in a wooden box opened in three divisions to the back: in this the glue, while yet soft, is cut into three slices by an instrument like a bow, with a brass wire for a string. The slices are then taken out into the open air and dried upon a kind of coarse network, fastened in movable sheds four feet square, which are placed in rows in the glue maker's field. When perfectly dry and hard it is fit for sale. That is thought the best glue which swells considerably without melting by three or four days' immersion in cold water, and recovers its former dimensions and properties by drying. Glue that has got frost or that looks thick and black, should be melted over again. To know good from bad glue, the purchaser should hold it between his eye and the light, and if it appears of a strong, dark color, and free from cloudy or dark spots, the article is good.

To this account may be added some experiments on a glue made from the raspings and trimmings of ivory, the refuse pieces and shavings of the button mould makers, and other pieces of hard bone that cannot be turned to account in entire manufacture. Six pounds of button mould shavings were put into a copper boiler with twenty-four quarts of cold water, and first let soak for two hours. The fire was then kindled and the liquor slowly brought to boiling, and kept at this heat for nine hours. After standing a night, fourteen quarts of clear gelatinous liquor were drawn off by a syphon, and two quarts more were

obtained by pressing the residue. This was duly evaporated without addition, and when of the proper consistence was allowed to subside for half an hour, when it became firm enough to cut into cakes, which being hung up for a fortnight in a barn, yielded fifteen ounces of solid glue, or rather less than a sixth of the weight of the bone shavings originally used. A similar experiment made with ivory turnings yielded nearly the same proportion of glue. The jelly from these clean white bones is at first very transparent, and with but little color, and when concentrated by evaporation it always deepens in color, but if well made still remains transparent. A piece of this glue put into cold water swelled, as happens with common good glue, and in twenty-four hours had absorbed fifteen times its weight of water, but without dissolving, and by again drying in the air it returned to its original bulk and weight. It appears that at Paris there are three sorts of glue commonly sold. The best is imported from England, and is of a deep red; the next in value is the Flemish, which is whitish and transparent, and the most ordinary glue of the country is black and opaque.

In using glue, the carpenters first break it and cover it with cold water, and let it stand for about twenty-four hours, by which, as already mentioned, it swells to many times its original bulk after which the soaked pieces are melted, without more water, over a slow fire and kept simmering for about a quarter of an hour, with frequent stirring, and are then cooled. It is now a firm jelly, of such a consistence as very readily to be cut by any instrument, but too stiff to be tremulous. When wanted to be used, it is merely warmed, which renders it sufficiently fluid to be spread over the surface of the wood with a brush. Wood joined by glue requires from one to three days to be perfectly cemented, which is known by the hardness of the portion that remains on the outside of the joining; and the force of cohesion of the best glue is such that boards as thick as any commonly used in furniture carpentering will quite as readily give way to violence in any other part of the substance as at the joining. Glued boards will not set in a freezing temperature, the stiffening being owing to the evaporation of the superfluous water of the glue, which is prevented by great cold.

A variety of gelatinous cements of less firmness than common glue and known by the general term of *size*, are made for the use of paperhangers, gilders, bookbinders, house painters in distemper, and many other trades, by boiling down in water the clippings of parchment glove leather, fish skin, and many other kinds of skin and animal membrane. These are used either alone or mixed with vegetable tenacious substances, such as flour paste, gum arabic and tragacanth, and the like. The preparations of these jellies is very simple, the substance used (parchment shreds, for example) being merely dissolved in water by boiling, strained and evaporated to a due consistence. Eel skins and the skins of other fishes make a cement which is much valued for its transparency and tenacity. — *Furniture Gazette.*

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BELOW will be found a list of the members composing this Exchange. Boxes are provided for each member, so that architects, owners, or others desiring the services of any particular member, or those having boxes who are not members, and yet whose business is directly connected with that of the Exchange, can readily secure the attendance of the party sought, by leaving a note in the respective boxes.

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Promptly forward your subscription for 1884.

tions for membership were received from A. A. Bennett and Emil John.

A long and earnest discussion then ensued upon the advisability of allowing one member of an architectural firm to belong to the Chapter when the other member or members do not desire to join. No definite conclusion was reached.

Committee on Indentures presented a report which was laid over till next meeting. The secretary was authorized to have printed a number of copies of the by-laws, immediately upon receiving the articles of Incorporation of the Chapter, and to combine the latter with the by-laws.

The meeting adjourned to Friday evening July 11th, as the regular night comes on the 4th, said day being a national holiday.

Division Fences.—The "Call" in Error.

A CORRESPONDENT asks, through the question column of the *Morning Call*, whether the respective owners of lots are obligated to bear equal proportions of cost of fences built upon the division line.

The *Call*, which in matters with which it is familiar generally returns correct answers to its querists, is correct in saying, "If two persons own adjoining lots, and one wishes to fence around his lot, he cannot compel the other to share the expense of the division fence between the two lots," but it is greatly in error in stating, "But afterward, if the owner of the second lot desires to fence in his property, he must pay half cost of the division fence if it is used as the only fence between the two lots." There is no legal rule or law justifying the use of the word "must pay." Morally, it would be only fair and just for the second owner to pay half cost of the division fence, but if he does not see fit to do so, the one who built the fence can have no financial redress in the cost thereof. He may by law prevent the second party from using such fence for the purpose of attaching clothes lines, sheds, or other constructions, or in any manner making use thereof, by nailing or securing to it. But the second man may enjoy the use of such fence for all the purposes of inclosure simply, without paying a farthing toward the cost of erection.

The Ordinances Regulating the Construction of Buildings in San Francisco.

THE "orders" defining the Fire Limits and regulating the construction of both brick and frame buildings in San Francisco, has been printed and bound in convenient form, containing 114 pages. The copy before us is the latest upon the subject matter regulated, having been passed by a vote of eleven to one in the board of supervisors, February 27, and approved by his honor, Mayor Bartlett, March 3, 1884.

The objects in view with those originating the various orders as passed, were evidently to define and enforce the practice of safe and secure methods of construction, with fire risks and

dangers as the basis of judgment, and the conclusions reached. The necessity for a perfect and equitable code of ordinances to regulate and prevent the many abuses that have been so commonly and generally practiced in San Francisco, is admitted by all intelligent architects and builders; for the violations and disregard of the correct science of construction and mechanical principles in the erection of buildings in California, are very numerous; and it is not a matter of surprise that those to whose special care the fire interests of the city are confided, should be alive to the importance and necessity of buildings being so constructed as to insure, first, the greater security against the occurrence of fire, and the best means and facilities in controlling conflagrations when they do occur; secondly, to diminish the risks and dangers always more or less possible to firemen during active service, and thirdly, the most practical and safest means of escape to occupants of burning buildings; all of which is proper and wise, where *common rights and privileges* are not unnecessarily prescribed and restrained. But it is possible, and a thing that has often been done by law-making powers, to go beyond limits at which they should stop; for there is the possibility in law and ordinance making, as in all the other affairs of life, of attempting, comprehending, and seeking to cover and do too much, thereby making legal enactments, passed presumably for the protection and bettering of matters and interests legislated upon, onerous and oppressive, and therefore unjust.

How nearly the exactly right and fair has been reached in the passage of the "fire limit orders," or how handsomely the overstepping of legitimate and proper bounds has been avoided, is a question undoubtedly affirmed and claimed by the framers of the "orders," while architects, contractors and owners very generally disapprove and oppose many of the provisions and regulations of the book of orders and submit thereto with no special manifestation of good grace.

The dissatisfaction that exists arises largely from the fact that there are many really competent architects and builders in San Francisco, who claim to, and do understand and know as perfectly, exactly and comprehensively the numerous requirements involved in building constructions, as do the law-making powers, whose knowledge of building matters and principles is almost exclusively second-hand, and devoid of any more than incidental personal experiences as to architectural or building sciences. And when such men are confronted in the exercise of their professional and mechanical practices, by legal orders and ordinances which in many of their details are considered as unnecessarily restrictive, faulty, and not of recognized consistency and practical utility, it is the most natural thing imaginable that a rebellious feeling should exist.

Reference is made to the subject under notice, simply because the feeling is so general, and so freely expressed by architects and others, in reference to many of the provisions of

the "orders," which, in the main, are good, sound and proper; and if purged of the objectionable features, would meet the hearty approval of all competent and worthy architects and builders, as both the professional and mechanical departments of building science are infested with men whose attempts at designing and construction require laws and orders to force them to even half consistent practices, and who would be much nearer their proper spheres of operation with the reins of a mule team or a pick and shovel in hand.

Buildings.

SECTION 48 of the "Fire Limit Order," as passed by the Board of Supervisors, provides that all doors of ingress and egress, to and from halls and buildings used for public assemblages, shall open both ways—inwardly and outwardly—and in no case inwardly only.

The section not defining explicitly the class of buildings contemplated, and included in and by the intent and meaning of the order, beyond the general expression, "all buildings used for public assemblages," the fraternal organizations people claimed that the order was not intended to reach and include halls and buildings devoted to secret society purposes, and the late decision of Judge Peral in the appeal case of District Engineer Kennard vs. John Goldman—the defendant having been arrested for misdemeanor, and tried in the Police Court for non-compliance with the order requiring entrance doors to halls to open outward—sustains the theory that lodge room buildings are not public halls, and therefore not subject to the provisions of the "Fire Limit Order!"

A QUESTION is raised by *La Semaine des Constructeurs* which is of some importance in this country as well as in Europe. One of its correspondents in speaking of the items which should be included in the cost of a party-wall, for the purpose of determining the amount that should be paid by a person wishing to use it to support an adjoining building, remarks that, according to the decision of the courts, the owner of the wall is not entitled to include the architect's commission of five per cent. as a part of the cost of the wall, half of which the adjoining owner is bound to pay in return for the privilege of using it. This seems to the correspondent, as well as to the editor of *La Semaine*, rather unreasonable, and the latter even goes so far as to say that where the party-wall had been constructed without the intervention of an architect, the owner should still be entitled to add the usual architect's commission, as compensation for the trouble which he had been at in making contracts and supervising the work. As five per cent. on the value of half an ordinary city party-wall would be from fifty to a hundred dollars, or even more, it ought to be worth some one's while to settle the question definitely. Although we have heard the point discussed here, we have never seen the architect's percentage specified as an item in the account of the cost of a party-wall. If any one of our readers knows of local customs or precedents favoring a different practice, we should be very glad to be informed of them.—*American Architect and Building News*.

Compiled Items of Interest for Mechanics.

Fire-Proof Fabrics.

MUCH interest has been shown of late years in the invention of processes for rendering fabrics fire-proof. The *Popular Science News* gives the following summary of the most approved methods:

Among the means recommended for this purpose, we may, in the first place, mention one of exceeding simplicity, applicable to muslins, and all dresses which are starched after washing. It is merely necessary to mix the starch with sal ammoniac and plaster of Paris. The goods thus dressed may certainly be set on fire by the flame of a match; but the fire does not extend. The inventor of this first process afterward recommended—

Borax.....12 parts.
Epsom salts.....0 "
Dissolved in 80 parts warm water.

The tissues to be prepared are dipped in the solution until thoroughly saturated. They are then pressed, wrapped in a cloth, wrung again, laid between cloths, and passed through a mangle, after which the articles are ironed while still damp. The necessary quantity of starch can be stirred into the saline solution.

Vogt dissolves—

Sublimed sal ammoniac.....2 parts.
Sulphate of zinc.....1 part.
Water.....15-20 parts.

The starch or other ingredients required for stiffening or finishing are added to the solution. The fabrics are steeped in the mixture till thoroughly saturated, pressed well out, and dried. According to Siebrath, a good result may be obtained by steeping the dresses in a solution of five per cent. alum and five per cent. phosphate of ammonia. Tissues so treated are said not to burn, even if previously rubbed with gunpowder. The powder deflagrated, but left the tissue unburnt.

Among other agents proposed for the same purpose are soluble glass, tungstate of soda, ammonia alum, and hyposulphite of soda. According to Versmann and Oppenheim, phosphate of ammonia is mixed with half its weight of sal ammoniac, and a twenty per cent. solution of the mixture is used.

Tissues which are intended to be ironed are afterward treated with a twenty per cent. solution of the tungstate of soda.

The "phenix essence" of M. Pereles consists of a mixed solution of tungstate, silicate, and phosphate of soda.

Nicol proposed a bath of—

Alum.....6 parts.
Borax.....2 "
Tungstate of soda.....1 part.
Dextrine dissolved in soap-lye.....1 "

The dextrine is said to cause the salts to adhere better to the fiber.

The following recipe is given in a recent German journal:—

Sulphate of ammonia.....8 parts
Carbonate of ammonia.....2 "
Boracic acid.....2 "
Borax.....1 "
Starch.....2 "
Water.....100 "

The dresses or other tissues are taken through this mixture boiling.

Another recipe is as follows:—

Boracic acid.....5 parts.
Sal ammoniac.....15 "
Potash felspar.....5 "
Gelatine.....1 "
Starch paste.....50 "
Water.....100 "

This mixture is applied with a brush.

Wooden and Brick Buildings. \$18.00

CINDERS IN THE EYE.—One of the most effective means of removing a cinder or a small particle of dirt from the eye, is said to be the introduction into the eye of one or two grains of flaxseed. The grain should be placed under the lids, and soon produces a mucilage, which envelops and drains away the foreign bodies.

Modern Perspective. \$6.00

TURNING SQUARE POSTS.—To drill a square hole used to be considered one of the impossibilities of the workshop, but some one with more ingenuity than sense contrived to do it. Turning square posts, however, is an accomplished fact, and machines for doing such work are in daily use. Square baluster posts, table legs, etc., are now produced, moulded or plain, in large quantities.

Builder's Guide. \$2.00

THERE is said to be a lady living in Canton, Miss., who is so modest that she turns her head when passing a pile of undressed lumber.

Cottages and Villas. \$6.00

THE VERY LATEST.—A man out West bought a bedstead, the wood of which was so green that one warm spring day it broke out all over with little groves of waving branches. In autumn the children picked the chestnuts from the side pieces, and the next spring tapped the headboard for maple sugar.—*Ex.*

Street, Store and Bank Fronts. \$4.00

DON'T.—Don't call a very large, strong, sinewy man a prevaricator. If you are sure he is a prevaricator, hire another man to break the news to him.

Universal Assistant. \$2.50

BLACK PANELS.—To obtain a hard, smooth, glossy black surface on wooden panels for art decorating purposes, dissolve gum shellac in alcohol and add enough powdered ivory-black or drop-ivory to give it the consistency to apply with a brush. Put on three or more coats, rub down with rotten-stone and a woolen cloth when dry, and varnish with thin coach varnish.

Practical Carpentry. \$1.00

IN order to obtain the largest possible square from a circle, multiply the diameter of the circle by 7,071, which will give the length of one side of the square.

Church Architecture. \$4.00

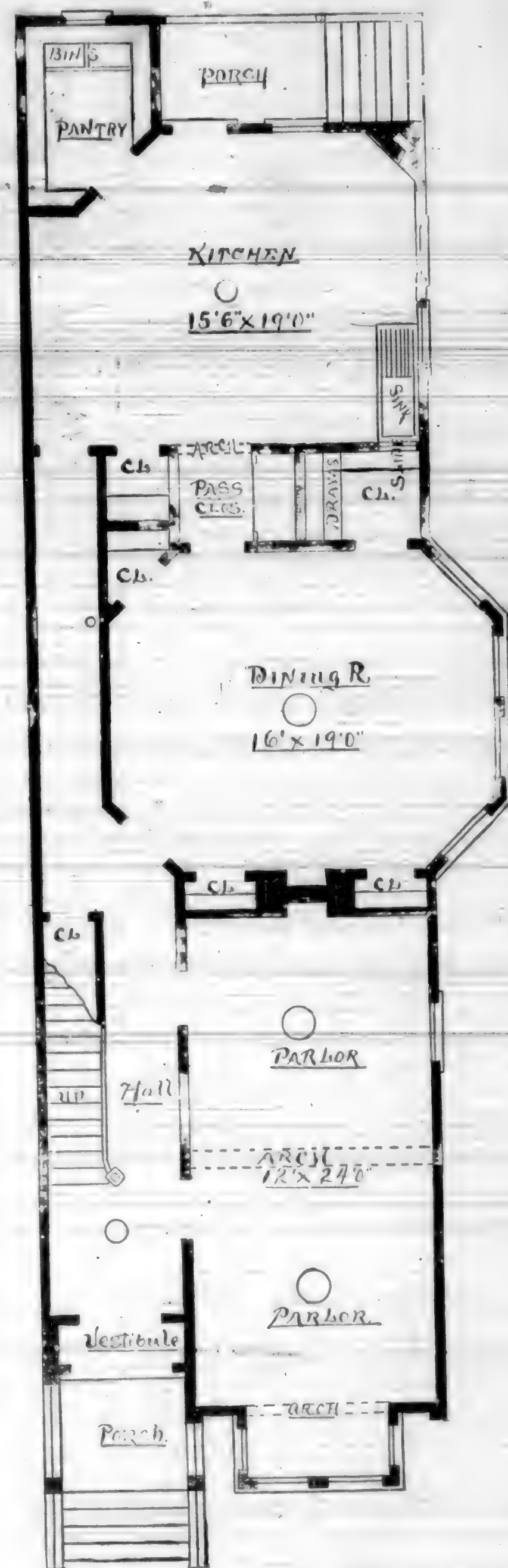
SLOW-GROWN VS. FAST-GROWN TIMBER.—A general impression exists that slow-grown timber is the strongest, but the opinion does not, it is said, stand the test of experiment. There is in London a government establishment for testing the quality and strength of all woods and metals used for government purposes, the chronicles of which are said to be very interesting. Among other things which have been proved there, is the fact that fast-grown timber—oak at least—is the strongest, and bears the greatest degree of tension.

Cummings' Architectural Details. \$6.00

A RUBBER cushion under the legs of a work-bench will deaden the sound of hammering so completely that it will not disturb the inmates of adjoining rooms.

Buck's Practical Designs. 50c

Standard Scroll Book. \$2.00



FIRST FLOOR PLAN OF \$5,500 DWELLING.

Our First Competition—Result.

AFTER a thorough and impartial investigation of the numerous plans presented by applicants, for the various awards offered by the proprietors of this Journal, the Committee have awarded the Premiums as follows:—

FIRST PRIZE; "AS YOU LIKE IT."—Author, Junius H. Morse, 10 Pemberton Square, Boston, Mass.

SECOND PRIZE; "GARRICK."—Author, John C. Wolf, 57 Broadway, New York.

THIRD PRIZE; "ORIOLE."—Author, W. Claude Frederick, 65 West Fayette St., Baltimore, Md.

FOURTH PRIZE; "Hoosier."—Author, J. W. Hammond, Frankfort, Ind.

HONORABLE MENTION; "TEASE SQUARE."—Author, Oliver C. Smith, S. W. cor. 6th and Vine Sts., Cincinnati, Ohio.

We publicly extend our thanks to the Committee, Messrs. Sanders, Pissis, and Mitchell, for their earnest efforts in arriving at the result. It was a task of more than unusual difficulty to decide upon the merits of the various plans. That their decision was just is evinced by the fact that not a single premium was awarded to competitors on this coast. Hence, no partiality was shown in making the awards.

After receiving the plans from the Committee, we carefully studied the various designs, and are satisfied that good judgment was exercised in declaring the result, as stated. We could not help but notice a general fault with all the designs. There is not a single one that can be built for anything like \$5,000 in this city, and, strange to say, the plans presented by competitors residing in California, were as far out of the way in this regard as those from the East. We also noticed carefully the estimates, and found that, although they were all near the required amount, still there were many items much too low, and many omitted altogether.

In one estimate the price of brick laid in the wall was given at \$12.50 per thousand. This figure is so much at variance with the price in this city, viz. \$20.00, per thousand, that we are at a loss to conceive the conditions which would naturally give rise to such a difference.

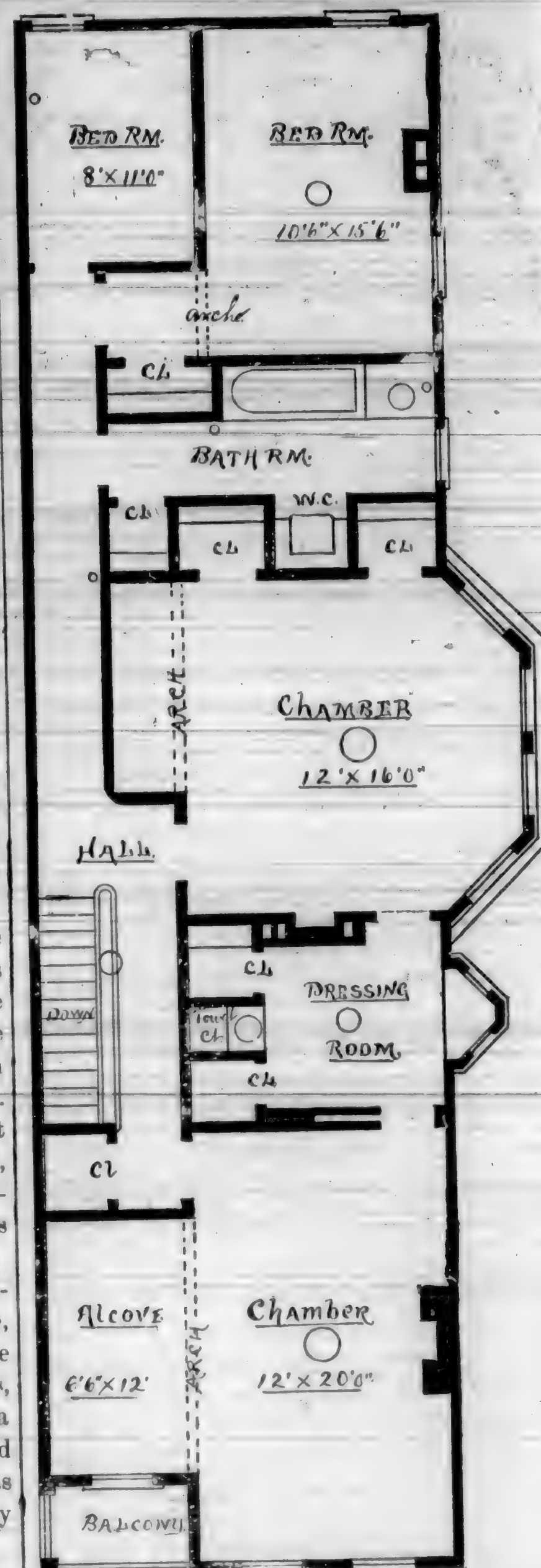
In another case, the labor was placed at \$1,350. This seems incredible in a \$5,000 house, but not hardly more so than is given in another estimate for work where the same is placed at \$430.

We very much regret that one of the contestants should have gone to the Committee, and, without the advice or sanction of the Editors of this Journal, withdrawn his plans, simply because he thought he could not get a premium, and therefore concluded he would withdraw the same before the result was announced. Being a new-comer, we generously overlook the affair.

We sincerely regret the apathy shown by architects and draughtsmen residing on the Pacific Coast, in regard to presenting plans for this competition. The premiums—\$60, \$50, and \$40—for the first three prizes were certainly worth striving for, and when, in addition to the money, the publicity given to the successful authors of the various designs is taken into consideration, we are surprised that more energy was not exercised by our California brethren in striving to secure at least one of the prizes.

As a whole we are well pleased with the result. There were more plans received than we had hoped for when our offer was made. Those receiving premiums, and those of whom honorable mention is made will appear in successive numbers of this Journal, the first of which will be in our July issue.

It is our intention to shortly issue a pro-

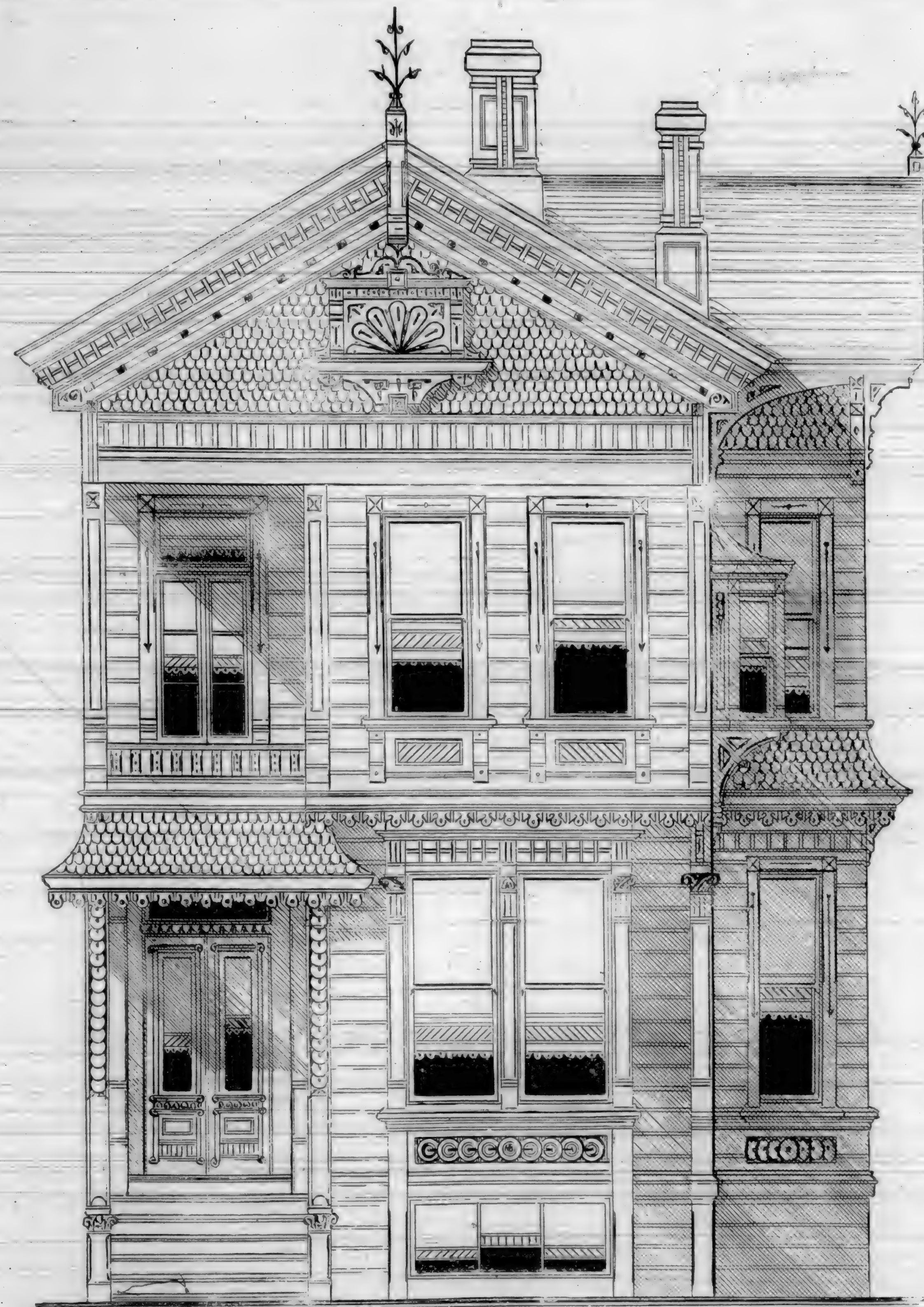


SECOND FLOOR PLAN OF \$5,500 DWELLING.

spectus for our SECOND competition. This will be for a country dwelling to cost not over \$3,500. To avoid such discrepancies in estimates as were contained in the first, we will specify distinctly the prices to be used for lumber, brick, etc. Parties desiring to compete will please send us their address as soon as convenient. This second competition is OPEN TO ALL.

All our competitions will be under the control of a committee appointed by the S. F. Chapter A. I. A., thus ensuring absolute fairness in the awarding of premiums.

Modern Carpenter's Companion..... 1.25
Modern House Painting..... 5.00



CITY OR SUBURBAN DWELLING, COSTING ABOUT \$5,500.

The Journeymen Painters' Movement.

At the time of going to press with the April number of this Journal, the issue between the master and journeymen painters remained unadjusted, with the indications strongly in favor of the workmen. Since then the anticipated concession has been made by the masters, and the journeymen are joyous over their success in securing the advance in wages demanded.

As was stated in a former issue, the resistance on the part of employers was influenced by a virtually criminal wrong existing with so many of those who assume the position of masters, whose regular business practice has been, and is, to swindle and rob owners through contract engagements, and honest bosses by the use of all manner of stuff manipulated into a solution made to resemble, to the unpracticed eye and credulous owners, the appearance of paint. And in fact a paint—for the term paint is defined by Webster's unabridged as, "To cover or smear over with coloring matter." Consequently any mixture that can be applied with a brush, and which gives color, comes under the name of paint, the ingredients used not being defined or expressed by the term. But when the painting of a building is let, either upon the basis of a specification or upon a verbal understanding, the universal presumption is that white lead and pure linseed oil shall constitute the pigments of the color used, and honest painters so understand the matter and govern themselves accordingly in fixing a value for the work to be done; while the "professors" of the adulteration art, destitute of all mechanical pride and principles, resort to the use of base mixtures, fifty to ninety per cent of which cannot be found nor purchased of any reputable house manufacturing or dealing in white lead, pure oils and genuine paint stock.

Consequently the honest men who do use the proper materials, and are faithful to their employers, stand no equal chance when the "professors" are allowed to compete. It is not reasonable to suppose that those who use genuine paint stock, costing, say ten cents per pound more or less, have any comparative standing with those who use slush, costing three to five cents per pound. And it is this unequal grievance that seemed to compel the master painters to resist an advance, while the "professors," knowing their advantages, could, with financial safety, accede to the demand for increased wages on the part of journeymen.

The terms "swindle and rob" have been used in this article; are they warranted? Emphatically, yes. Robberies and swindles are of unlimited kind and varying degrees, and those who, through contract opportunities, obtain money from owners in payment for material used and work performed, differing from, inferior to, and of far less value than that covenanted and agreed to be used, are nothing less than a special class of swindlers and cheats. Yet the class of owners who let their work to such men,

simply upon the ground that the parties offer to do the work at a very low price, without any regard to the standing or reputation of the persons engaged, merit all the bad usage received; while that fact does not lessen nor justify the rascalities of those who abuse and degrade a mechanical pursuit, about and around which clusters so many grand and sublime facts in history, in the arts and sciences, and in the grandeurs of the universe, with its mountains, fields and valleys made beautiful by the Artist of eternity, in the millions of tints, hues and colors spread out over all of earth's surface, each shade being in and of itself pure and unadulterated, proclaiming to the world their origin through the perfect and pure laws of natural growth, as established by Him who organized the perfect system of truth and love, brought forth by each return of seasons, and who added to the sun's golden rays, the soft moonbeams of night, and completed the beauties of the firmament by changing clouds of unspeakable grandeur and the colors and tints of arching rainbows.

But we leave the subject in hand for the present, to be further considered and treated when we shall have gathered and added to our practical knowledge of the matter other information in detail, sustaining and confirming all that has been outlined in this article.

To this end we ask the assistance of all reliable users of pure paint material, whether masters or journeymen, assuring them that authenticated facts alone, without the use of name, will be used in this connection.

THE STRENGTH OF WOOD.—It may seem strange, says the *Midland Industrial Gazette*, that a board one inch in thickness, of any solid wood, requires less force to tear asunder than one of the same thickness composed of a number of layers of wood, the resistance being augmented by crossing the grain. For instance, five samples of lumber, as represented in the following, were carefully adjusted and subjected to tension with these results:—

Walnut, solid		87.4	pounds to tear asunder.
Gum, " "		98.7	" " "
Poplar, " "		71.13	" " "
Cherry, " "		84.07	" " "
Ash, " "		69.91	" " "

One-fifth of an inch of each sample was now placed together, grain all running in one direction, when, after being glued and thoroughly dried, it required a strain of a trifle over 100 pounds to tear apart, and the strangest feature of all was it separated with the wood that showed the greatest resistance when tested solid, hence though the resistance is increased in all, the weaker woods show the greater. Again, the grain was crossed with each layer alternately when the resistance was still further increased 28.5 pounds, and when crossed diagonally we found a better result still, it being about 80 pounds greater than required to split or tear asunder the original wood.

Practical Perspective, \$6.00.

Practical Carpentry, \$1.00.

Nails.

A LARGE dealer in builder's hardware said recently that the demand for clinch or clout nails and for chisel pointed wire nails had largely increased within a year, as compared with that for the ordinary cut nails, and that flooring nails with the wedged-shaped heads were also used in place of the nails with the flat upset heads. His reasons were that better work resulted from the better nails, and there was far less waste. For the coarsest purposes the less first cost of the ordinary cut nails with the flat head induced builders to continue their use; but he believed the improved form and better material of the tough wire and clinch nails would, in time, drive out the inferior material and defective form. The principal advantage of the wedge-shaped head, as in floor nails, is that the head never breaks off in driving, as it is only a gradual enlargement of the body of the nail, instead of an upset across the nail. But the chisel point of the wire nail is its especial merit, as it cuts a clean passage through the fibers of the wood for the following of the body of the nail, instead of "stunting" and mutilating the fibers, as the blunt-pointed nails do.

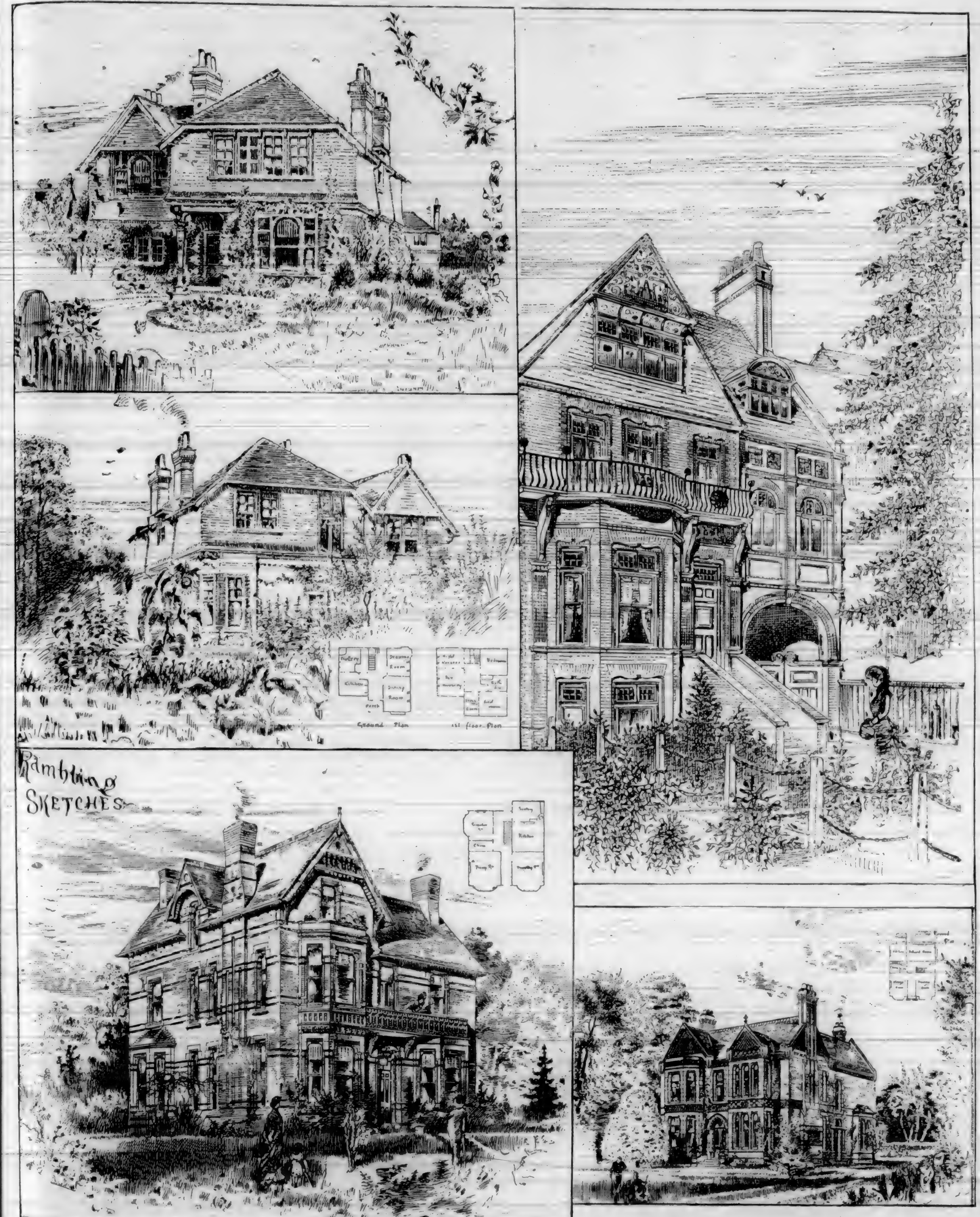
The common cut nails will not usually clinch, even when the clinch is turned in the direction of the grain of the wood; but they may be considerably toughened by heating to a red, and gradual cooling. A hardware establishment was burned a few years ago, and among the stores were nearly a hundred kegs of cut nails of various sizes. The remains from the fire were sold to another dealer, and as soon as the value of the burned nails became known he could sell no others until they were gone.

The Little Shop.

It is time that notice should be taken of the work done, as well as of the place taken, by our small shops. The "big concerns" do not monopolize all the skill and mechanical capability in the country. They may profess to do the best work and produce the best results, because they are furnished with the best tools, but they do not monopolize the mechanical skill, nor collect all the best workmen. Many of the best manipulators, and a very large proportion of the most exact mechanics, are in the little shops, content, may be, to be the foremen, when in a big shop they would be only first-class workmen. The small shop men are valuable in any shop where mechanics, rather than operatives, are required, because they are generally "men at a pinch," "expediency men," and generally excellent workmen.

The proprietor of a large manufacturing establishment, building fine tools of a particular character, claims that his best men come from small shops, where make-shifts and contrivances are the rule. "Such men," he says, "can make the shop hum" by their methods.

It is very convenient to have a shop full of adapted tools, but it is also convenient to have in the shop graduates from "the little shop," who can contrive, as well as tend, a machine. —*Scientific American*.

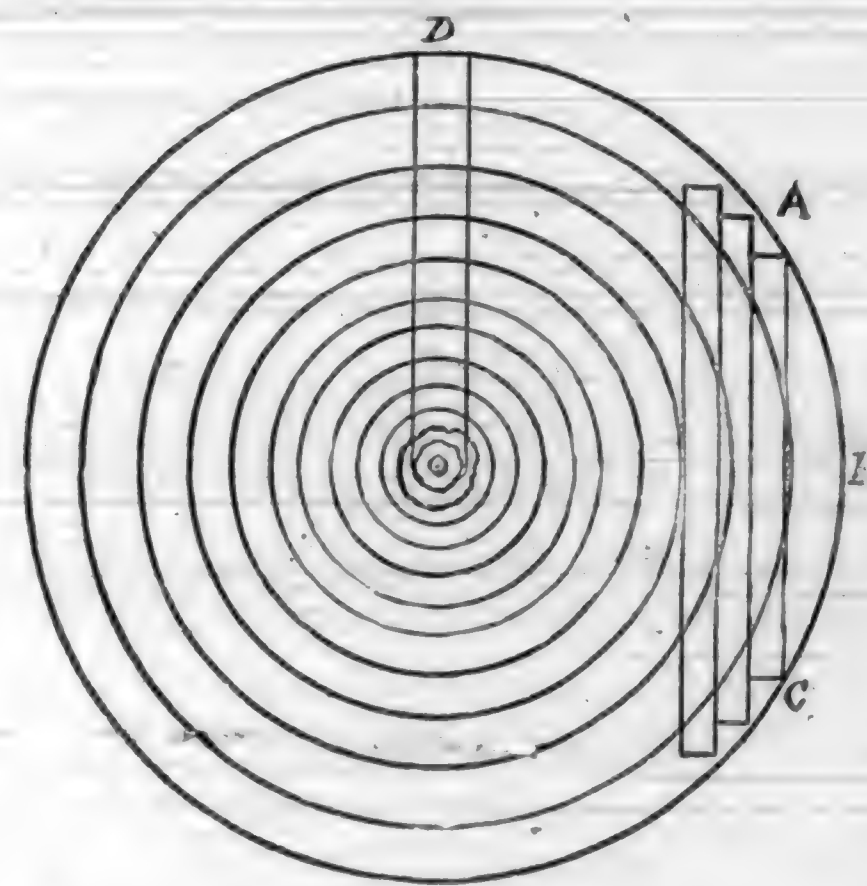


A FEW GENERAL DESIGNS FOR COUNTRY DWELLINGS.

Strength of Wood.

It is a fact well known to builders that the same varieties of wood will bear different weights, when placed in different positions as regards the running of the grain. Again, it has been repeatedly demonstrated that, at certain angles, timber will sustain greater weight than at others. There are certain well defined laws governing this that will be explained further on. To introduce properly a subject of this kind, it is expedient that we define more clearly the changes which wood undergoes from the time the tree is felled until the wood rots. All lumbermen have noticed that wood contracts less in diameter than in circumference. This disposition of inequality will explain why whole timber generally contracts in drying. In consequence of this irregular contraction, a board may be cut from a tree that, by any means known, cannot be made to retain its original shape, especially if subjected to alternate dryness and moisture constantly, as with exposed lumber in this climate.

If we take a log of any timber when cut clean, it will show up something like the following, though the rings will not of necessity present the regularity as represented in FIG. 1, still this plan will illustrate our meaning.



If we cut a couple of boards in different directions relative to their transverse septa, so that the septa crosses the middle of one board at right angles, while on the other they lie nearly parallel, then place these in a warm room under similar circumstances, we will find the board which has been formed by cutting across the transvers septa, as at *a*, FIG. 1, soon changes its form very perceptibly, the one side becoming concave and the other convex, and in seasoning it will contract nearly 14 per cent. in width. The board taken out at *d*, where the septa is nearly parallel with the surface of the board, will retain, with slight variations, the form it assumed on leaving the saw, and will not contract to exceed one-fifth as much as the other in width, but nearly equal the contraction in thickness.

In the softer, gummy and resinous woods, the difference is still greater than in the hard woods. It follows, then, from these experiments, that there is great advantage to be de-

rived by a proper attention in cutting out boards for panels, etc. It will be found that panels cut in such a manner that the septa are nearly parallel to their faces, will appear of a finer and more even grain, requiring less labor to dress, make smooth, and give a good finish if not painted, or to take less oil if painted and grained. To be sure, this making all the boards with the septa in this relative position as regards the surface, is impracticable, inasmuch as the heart of the tree would have to be discarded. To overcome this seeming obstacle is not difficult by any means. When a board seasons, it always becomes concave on the surface nearer the outside of the tree, and *vice versa*; or, in other words, to use a common phrase, the concentric rings seem to be straightening out, hence the board will be hollow where the ring would indicate, simply because the rings of the wood, when cut across, are relieved from tension, and in their endeavor to expand themselves, cause the hollow on the outside and the ridge on the opposite side. So, if the board be ripped down the center and the stuff turned inside out, the wood is reversed, and one contraction counterbalances the other, and the board seasons even, and in this way the most perfect glue joints can be made; and for the manufacture of fine goods, such as furniture and the like, more especially in oil finishes, the effect of this change is indeed beautiful.

There is another kind of contraction in wood while being dried, of great inconvenience and trouble to builders. This is a tendency of some woods to curve in the direction of length. Often this disposition manifests itself after the timbers are framed and in position, causing a repetition of labor, or leaving a crooked job as an enduring monument of poor or slighted work. We often find walls and ceilings out of true, and blame the architect or builder, when the real fault, if such it may be called, is with the elements and physical forces over which man has little or no control. In the long style of framing, for instance, it has often been observed how difficult it is to prevent the stile of a door, hung with centers, from curving, so as to rub against the jamb. To overcome this is not difficult, if we will stop and consider that the interior layers of wood, being older, are more solid and compact than the exterior layers of the same tree; consequently in drying, the latter contract more in length than the former. This unevenness or irregularity of contraction, causes the wood to curve in the direction of the length, and may be avoided by cutting the parts of each piece so that they shall be as nearly the same age as possible. But inasmuch as this would necessitate considerable waste of lumber, it can be overcome by taking pains to always turn the stuff so that the heart of the wood will be outward. Then in framing a door the heart of the wood should always go against the jamb, the sap against the panels.

Architects' Companion, \$2.50.

History of Architecture, \$15.00.

Growing Black Walnut Trees.

BLACK walnut can be grown from the nut, producing a butt fourteen inches in diameter in as many years from the seed, as far north as Massachusetts. No tree valuable for its timber in cabinet uses, unless the black birch be so considered, can attain to that useful growth in that period of time in our northern climate. Maples require twenty years before they become good timber trees; beeches and birches, fifteen years to attain to a diameter large enough to yield nine-inch boards; hickory should have a growth of thirty years, and cherry at least as much.

The cultivation of the black walnut might be made a source of profit, if only as an auxiliary to the ordinary farm products. It requires no particular care, makes an elegant tree, even in its youth, and later offers an agreeable shade.

One hundred acres of land, seeded to walnut trees, if they even reach maturity in fifteen years, would be more remunerative than many of the crops produced by fifteen of incessant toil. Besides, these trees might be planted and would thrive on spots which are really valueless for agricultural purposes, and while in the course of growth would serve as valuable aids to agriculture as wind-breaks, and in other respects.

A Watch Made to Be Pounded.

WHEN a visitor to the office of the American Bank Note Company sat down to talk to Mr. Lee, that gentleman put a piece of white paper under a stamp, pounded on it, and laid the paper aside. When the visitor rose to go away, Mr. Lee put the paper under the stamp again and pounded it once more. "You talked eight minutes," said he; "that wasn't bad." He showed the paper to the caller, who saw upon it two printed clock dials. One showed the hands at four minutes to 4 o'clock, the other showed them at four minutes past 4 o'clock. "We keep that stamp," he said, "so that you sha'n't go away and say you came here at 11 o'clock in the morning, or that you had to wait an hour and a half, or make any other misstatements which can be guarded against."

"No," he added, a moment later; "that stamp is the latest wrinkle in office furniture. It is an ordinary stamp with a clock attachment. The hour hand is simply a raised point upon a movable circle. The minute hand is an arrow on another revolving circle. The usual inked tape passes over these indicators and the outer circle of hour figures. Beside the clock face is a cylinder with several faces, each bearing a word—one is 'approved,' another is 'wired,' another is 'answered,' others are 'delivered,' 'Lee,' 'received.' Thus a business man is able, whenever he sends away a letter, telegram, or package, receives an order, or transacts any business whatever, to record the precise moment at which the thing was done. It costs \$20.00. I did not invent it. I bought it."—N. Y. Sun.

A. A. Bennett.

MR. A. A. BENNETT, to whom this brief biographical sketch refers, was among the earlier arrivals to our golden shores, and a description of his coming will be found full of interest. He, together with thirteen other pioneer spirits from Alabama, banded together and styled themselves "The Montgomery Company," consisting of Mr. Bennett, Dr. A. Gindrott, J. H. Paul, J. H. Skates, J. Yarbrough, S. Cole, P. Bibb, H. Smith, J. B. Davidson, E. Lynn, Col. D. M. Boyd, George Albright, Mr. Klock, and Mr. Lindsey, a Baptist clergyman from Mobile, sailed from New Orleans in the steamer *Galveston*, early in 1849, and when in the Carri-

bean Sea, on Washington's birthday, February 22d, she broke her piston-rod and was obliged to rely solely on the limited quantity of canvas she spread to carry her into port, so the Captain made for British Honduras, arriving there safely. Here, part of the passengers, Mr. Bennett among them, chartered the British brig *Thetis*, which conveyed them to Chagres, the steamer being afterwards towed to New York. The company went up the Chagres River in small boats to Gorgonia, and from there Mr. Bennett tramped to Panama in one day, carrying his rifle on his back and hiring natives to carry his baggage. On their arrival at Panama, they found the people panic-stricken from dread of cholera, which was then epidemic there. After remaining there two months the company embarked, with 365 passengers, on the old ship *Alexander Von Humboldt*; were 102 days reaching the Golden Gate, stopping a short time, for supplies, at Acapulco. At last the old ship, after being tossed by wind and wave, landed her human cargo at San Francisco, the landing taking place on the 30th of August, 1849, the boats touching ground where the old Montgomery Block Building now stands, at the corner of Montgomery and Washington Streets. Although very short of rations and almost losing hope of ever reaching the golden land, it was not destined that she should go astray, as she bore many a name on her list of passengers that was to be felt in moulding the history of that wonderful State—yet unborn—California.

Aside from the subject of this sketch, there was Dr. Morse, whose name and services are dear to every Odd Fellow both here and in Europe; James Anthony, of the Sacramento Union; Jonathan Kittredge, and Capt. John Clark, whose name has long been familiar to

land-owners and students of Spanish archives. All of these have passed to their long rest, but there are yet among the living many more who have been prominent in civil or commercial circles, none more so, perhaps, than C. P. Huntington, to whom we owe our railroad system and whose fame is known throughout the civilized world. In commercial circles we find the name of Isaac E. Davis, of Davis & Cowell, James Irvine, B. A. Hendricksen, A. M. and L. M. Starr, and James E. Gordon, of the Gordon Hardware Co., the latter gentleman being Secretary of the Humboldt Association, composed of the surviving passengers of the old ship above referred to.

Having been closely identified with the growth and architectural advancement of our



CAL. ELECT. ENG. C.

A. A. BENNETT.

State, this brief biographical sketch of his life will be interesting to the readers of our Journal. Born in Schoharie County, New York, July 26, 1825, of parents whose lineage is traced back to the earlier settlers of New York, he has those sterling qualities that lead to giving exact justice to all, and a steadiness of purpose that no obstacle can daunt or throw aside. Both parents were Quakers in their religious faith and practice.

His father, Dr. Joseph Bennett, wished him to study his profession, but from boyhood he evinced a strong desire to become an architect, and as a primary study in that direction, engaged himself at the early age of sixteen to his brother William, at Stamford, to work as a

carpenter and joiner in Delaware County, remaining there two years. From there he returned to his native town, and, under the tutelage of his brother-in-law, Orson Phelps, commenced the study of architecture and carpentry, remaining with him nearly three years. In 1846 he went south, to Montgomery, Alabama, and was there engaged in building the State Capitol. In 1848 he designed and built the Orion Academy, at Orion, Alabama, the Grand Master of Alabama coming from Mobile to assist in laying the corner-stone, the edifice being one of the most imposing structures of its day. From Alabama he came, as before mentioned, to California, arriving here August, 1849, and at once engaged in architecture, contracting and building. In the spring of 1850 he removed to Sacramento, where he remained until he again took up his residence in San Francisco in December, 1876, where he has resided ever since.

In Sacramento he constructed some of the finest buildings of the capital city, among the number being the Odd Fellows Temple, Golden Eagle Hotel, Arcade, County Hospital, and other places of note. He was the State Architect under the administration of Governors Haight and Irwin, at which time he was engaged on the State Capitol, Governor's mansion, prison and work-shops at San Quentin, and also revised and completed the branch State prison, at Folsom. Among the prominent buildings of which he was architect, are the Mechanics' Art College, at Berkeley; the Court Houses of Yolo, Stanislaus, Merced, Tulare, and Kern Counties.

In February, 1883, he associated himself with J. M. Curtis, present Architect of the new City Hall, since which time the firm plans have been adopted for the Court Houses at Santa Rosa, Sonoma County, now in course of construction, at a cost of \$80,000, and one at Eureka, Humboldt County, to cost \$100,000; also the building of Red Men's Hall, in this city.

Paint Adulterations.

We have repeatedly been asked to give the form of adulterations used in paint mixtures. This we cannot do, as there are by far too many already familiar with the nefarious art, and we do not propose to give information which will either help them by additional points, or which will tend to lead into erring paths those who have not as yet been able to master a knowledge of how to injure themselves and their trade by the use of illegitimate material. Better to keep the standard as pure as possible.

The Frieze.

BY R. H. PRATT.

THE frieze is, undoubtedly, the part of the wall decoration best adapted to ornamentation; it bears the same relation to the wall that a cornice does to a house, or a capital to a column. A frieze should give dignity to the room, and should, therefore, be sufficiently wide to admit of ornament that will not seem cramped or insignificant when seen from the floor. Some friezes look well when a few feet from and on a level with the eye, but when placed at the top of a wall of very ordinary height, their design is lost and the result disappointing. The relative proportion of wall and frieze is a matter of taste; the tendency seems, however, to be toward having them too narrow rather than too wide. It is often said that unless narrow borders are used, the ceiling will be made to appear low. It should be known that a too narrow border or frieze will have the same objectional effect.

Most often the apparent lowering of the ceiling is caused, not by the width of the frieze, but by its color or design being inappropriate to the paper below, or to the furnishing or use of the apartment.

Correct proportion is very important in decoration, and experience has taught that, provided the design and colors be suitable, a wall of 9 feet in height should have a frieze of about 8 or 9 inches in width; if the wall be 10 feet 6 inches or 11 feet, the frieze should be 15 or 18 inches wide. These proportions will be pleasing if the colors are appropriate in the papers and in the friezes. Sometimes there are friezes made that match the wall papers, having the same design and colors; this plan is of rather questionable propriety. The most satisfactory are to be found where the paper and frieze do not match so exactly in color, the frieze being much richer and more pronounced than the paper, and at the same time, there should be the proper harmony or feeling between them.

The mistake is often made of using paper and frieze together that have not the slightest relation to each other; for instance, sometimes a frieze of conventional design above a wall paper whose pattern is naturalistic or flowered or *vice versa*, or some other incongruous arrangement that is anything but decorative.

Where the paper is dark, it is better to have the ground of the frieze lighter than the paper and the colors brighter; in fact, it is very doubtful whether dark colors should ever be used in friezes; it seems proper to use dark and heavy colors for dados, but it seems most appropriate to use light colors or gold for frieze backgrounds.

When the walls are over 10 feet in height, the effect can be much improved by using a narrow band of plain colored paper immediately below the lower edge of the frieze, and let this band be separated from the wall paper below by the picture moulding or other narrow

wooden moulding having not much projection. This band of plain paper should be of a tone that is in harmony with the general effect of the paper and frieze, and of about the same intensity of tint as the wall paper.

In most rooms the windows are of such height that their casings project beyond the lower edge of a wide frieze; in cases of this kind when the effect is unsightly, there are two methods of overcoming the difficulty. One plan is to have a narrow shelf placed over each window, either resting on the casing or a little above it, if the space be sufficient; upon this shelf small plaques or vases may be displayed, thus distracting the attention from the frieze, or the curtain pole or valance may be placed nearer the ceiling, and if the window casing show below the pole it may be covered by a valance.

Like other paper hangings, the tendency in many friezes is toward over-crowding, and too much elaboration, which is apt to render them ineffective and feeble. Friezes whose ornament is vertical, or if floral appears to grow toward the ceiling, are well adapted to rooms whose ceilings are not very lofty, for the reason that all ornament or decoration having an upward tendency, adds to the apparent height. Such friezes should be so arranged that the upper part nearest the ceiling should be more open and less crowded than the lower edge.

Avoid growing or vertical friezes whose upper margin or finish is heavy; the upper edge should be like a sky or atmosphere. If, however, the pattern of the frieze be of the scroll or running vine description, the finish on the top and bottom may be equal in width. This kind of frieze is best for large and lofty rooms.

As the frieze has generally as much to do with the appearance of the room as the paper, great care should be used in selecting; recollect that the frieze is not exposed to so bright a light as the wall paper, and, consequently, should be brighter in its color; the ground may be of gold, or of a lighter tint than that of the wall paper. When the paper on the wall is very light and delicate, and it is impossible to have lighter colors in the frieze, let it be on the same ground, but with more pronounced colors, but do not let the colors of your frieze be so prominent as to kill the effect of your wall paper. Do not have the difference so great as to be unpleasant, nor so nearly alike that it is difficult to determine when the frieze begins; it appears as though the paper extended to the cornice or ceiling. If gold be used in the frieze, it is best as a ground and not as a figure. A gold frieze may be used above a paper that is without gold with good effect.—*The Decorator and Furnisher.*

REMOVAL.

Notice the removal of Dunham, Carrigan & Co. to their new quarters, 17 and 19 Beale, and 18, 20, 22 and 24 Main Street. They carry the largest stock of Builders' Hardware of any firm in the City.

Why Work is Scamped.

THERE are said to be tricks in all trades, and the rule apparently holds good in the house-painter's craft. He has, it appears, two ways of complying with a contract. If the owner of a house personally employs him to put on so many coats of oil and lead color, he will carry out the order exactly without stinting materials; but if the owner entrusts an agent with the business, the house-painter knows that his intermediary will expect a handsome commission, and this must be obtained at the expense of some other person. If the painter pays it out of his own pocket, all his profit will vanish; were he to put the matter to the owner, an *expose* would be certain, with the result that no more business would ever come from that agent. In this dilemma the sorely-driven painter saves himself by doing his work in the cheapest possible way, without giving heed to the terms of the specification. At all events, this was the confession frankly made to us the other day by one of the craft. The man stated specifically that if an owner ordered two coats of oil and lead color to be put on a house, he would faithfully comply; but if the commission came through an agent, one coat of size and one coat of oil and lead would be made to serve the purpose. The agent, of course, would not say anything for fear of having his black mail cut down.

Paste for Paper-Hanging.

BEAT up four pounds of good, white, wheaten flour in cold water—enough to form a stiff batter—sifting the flour first, and beat it well to take out all the lumps. Then add about two ounces of well-powdered alum. Have a quantity of boiling water ready at hand, take it boiling from the fire and pour it gently and quickly over the batter, stirring it rapidly at the same time; and when it is observed to swell and lose the white color of the flour, it is ready for use. The quantities here indicated should make about three-fourths of a pail of solid paste. It is recommended not to use it while hot, as when cool it adheres better and goes further.

A little cold water poured over the top of the mass will prevent the formation of a skin from the drying out of the paste. When about to use, a small additional quantity of cold water should be added, so that the paste will spread easily and quickly under the brush. In warm weather this paste must be used quickly, as it cannot be kept for many days without fermenting and souring, when it becomes thin, watery, and useless. If it be desired to avoid this, the addition of a few drops of carbolic acid to the mass when it is prepared will enable it to be kept almost indefinitely.

STEEL SINKS.

Send to Richards & Snow, 406, 408 Market Street, for a circular containing a full description of these necessary adjuncts to a cleanly kitchen.

A NEW AND VALUABLE BOOK.**"How to Build, Furnish and Decorate."**

THIS is the title of a book recently published by a co-operative building plan association, of New York, and which deserves more than a passing notice from the hands of those who appreciate the need of a higher order of architecture, and greater harmony in the furnishing and decoration of a home. It contains the astonishing number of one hundred and twenty-six different plans for buildings, the majority of which are for cheap but tasteful dwellings, such as cottages, villas, and the like, of all conceivable styles of architecture and construction. Many of the views are shown in perspective, enabling one to see just how the building will look. The series of plans occupy only one-half the book. There are about forty pages devoted to furniture and decoration, liberally and handsomely illustrated, following which are over a hundred other designs, embracing barns and other out-buildings, dairy houses, cheese factories, piggeries, aviaries, corn-cribs, poultry sheds and houses, ice houses, summer houses, with a great variety of rustic designs for arbors, lawn baskets, vases, etc.

Landscape gardening is also touched upon, plans being furnished for laying out garden and fruit grounds, making artificial rock-work for fountains, and the construction of hot-beds and green-houses. How to build a cistern is fully described and illustrated. In short, it is probably the most comprehensive work of the kind that has been issued in this country, and its publication must have involved an enormous sum of money.

A supplement to the latest edition contains full and complete blank forms for the most approved form of specification to be used in building, together with blank forms of contract and builder's bond. In connection with the latter, is a blank form for a "bill of quantities," which provides for everything that can enter into the construction of a building, and is divided into "Mason's Estimate," "Carpenter's Work," including materials, "Slater's Work," "Tinner's Work," "Plumber's Work," "Painting," and "Miscellaneous Expenses."

The price of this remarkable work is only \$5.00, and it would be cheap at three times the figure. The publishers of this paper are agents for its sale, and will send it to any address in the United States on receipt of the price.

To Render India-Ink Waterproof.

AS THE ink is prepared with a certain proportion of gelatine, the addition of a little bichromate of potassa, followed by exposure to sunlight, has been recommended for rendering the ink so insoluble in water, that it will not run or spread when water colors are used for shading the sides of the lines.

Cottages and Villas..... \$ 6.00
Plasterer's Manual, enlarged..... .75
Modern Perspective..... 6.00

**PATENTS AND INVENTIONS.****List of U. S. Patents for Pacific Coast Inventors.**

*From the official list of U. S. Patents in DEWEY & CO'S SCIENTIFIC PRESS PATENT AGENCY, 252 Market St., S. F.

FOR WEEK ENDING MAY 27, 1884.

299,098.—FAN BLOWER—F. C. Anderton, S. F.
299,330.—PILOT OR WHEEL GUARD—Bennett & Fitch, S. F.
299,331.—WELL PIPE CUTTER—A. W. Benson, San Bernardino, Cal.
299,195.—PLOW—J. A. Bilz, Pleasanton, Cal.
299,208.—LAYING AND SECURING RAILS IN ROAD BEDS OF RAILWAYS.—J. Denechaud, Sr, S. F.
299,211.—DRY SEPARATOR—H. Earhart, Santa Maria, Cal.
299,368.—SEWING MACHINE.—Fisher & Hart, S. F.
299,470.—SELF ADJUSTING PULLEY—W. A. Grondahl, Portland, Or.
299,383.—TAILORS MEASURING DEVICE—J. S. Hand, S. F.

299,226.—DRY CLOSET—T. W. Jackson, S. F.
299,234.—SAFETY GUARD FOR CARS—F. P. H. Loftis, S. F.
299,409.—AMALGAMATING PAN—Geo. H. Malter, S. F.
299,237.—FARM GATE—Chas. W. Mann, Haywards, Cal.
299,238.—WAGON TONGUE SUPPORT—W. P. Martin, Chico, Cal.
299,259.—AMALGAMATOR—Edward Pike, Salt Lake City, U. T.
299,496.—METAL BORING AND SLOTTING MACHINE—J. Richards, S. F.
299,271.—BUCKLE AND RING—Jas. B. Sayre, Sacramento, Cal.
299,186.—WATER JACKET FOR ROTARY PUMPS—A. W. Von Schmidt, S. F.

NOTE.—Copies of U. S. and Foreign Patents furnished by DEWEY & CO., in the shortest time possible (by telegraph or otherwise,) at the lowest rates. All patent business for Pacific coast inventors transacted with perfect security and in the shortest possible time.

Apprentices' Column.

IN reply to a request made last month, by an apprentice, regarding the finding of bevels and cuts for hoppers and lay-back seats, the following is submitted. It is old, but correct and simple. Let Fig. 1 represent a box or hopper whose sides splay; or it may form a bread-tray, or the back and two ends of a wagon or sleigh seat, if we take off one side and cut it off

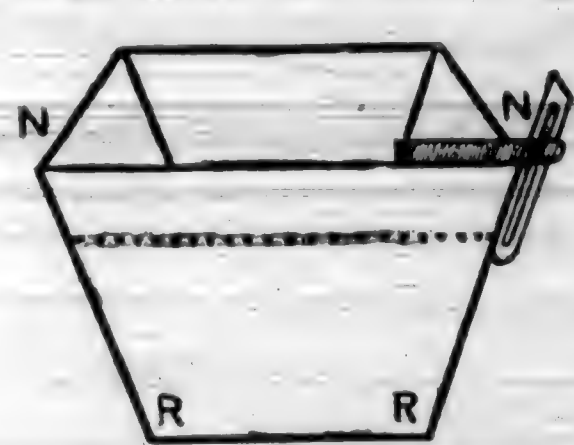


Fig. 1.



Fig. 2.

at the dotted line, where a seat would be required. The lines NR show the bevel or splay of the box. Take this bevel and transfer it to the end of one piece of the stuff you intend using, as shown at P , Fig. 2. Then take the distance SO , on the marking gauge, and run a line on the board from O to K , Fig. 3. Now make the line AB the same bevel as the hopper, or, the bevel as now set, may be applied with the stock resting on the edge R ; then the blade will represent the line AB . Square up from M , cutting AR at P , then square over

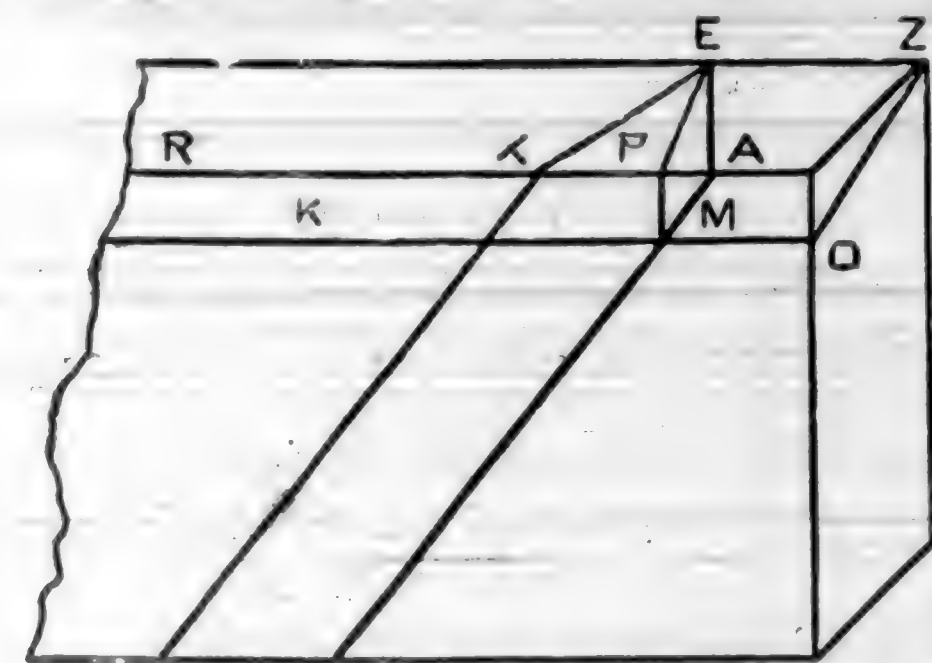


Fig. 3.

on the edge the line PE . Then connect A and E , which will be the angle required for a butt-joint, the inside corner being the longest. If it is required to miter the joint, set off the thickness of the stuff as measured at ZO , from A to X , then the line XE will be the bevel sought.—*The Builder and Woodworker.*

A Preacher on Hot Boxes.

WE heard a preacher in a fashionable up-town church, last Sunday, expounding the advantages to mankind of keeping the Sabbath. As an illustration of how all nature, inanimate as well as animate, required cessation from labor, he said: "Even in traveling with railroad trains, we find that stops have to be made at certain distances to let the axle-boxes get time to cool. The labor of running makes these boxes get hot, and, if their necessity for rest was ignored, they would get red-hot and burn up the train. But the train-men understand the case, and the train is stopped for a time, and, while passengers go out and refresh themselves, the boxes are getting refreshed by rest. They cool down in a few minutes, and then the train can proceed in safety."—*American Machinist.*

Competitive Contracts.

THE old saying that "competition is the life of trade," like many old sayings, is a very one-sided expression of truth. It frequently degrades, and sometimes destroys, legitimate trade, instead of promoting it. It implies more or less directly a considerable amount of dishonesty or incompetence lying around, otherwise there would be no occasion for it. Undoubtedly these troublesome defects abound in human nature, and we cannot safely ignore them, but that all our business management should be based upon these sandy foundations is most unfortunate. Competitive examination, tests, and endeavor in many directions, are indispensable, but there are certain points and considerations that should be kept faithfully in view, or competition is but another name for boasting and deceit.

The first essential in an honorable competition, one in which an honorable man would be willing to take part, is that the thing to be done should be clearly understood, not merely by the participants, but by those to whom the results are to be submitted for decision. To ask estimates upon work, the real quality and value of which is not clearly and uniformly understood, is simply absurd. It is random guessing at an unknown quantity. The practice of issuing a general invitation for estimates in open competition is, in most cases, a pernicious one, if not actually dishonorable. By way of safeguard it is customary in such cases to reserve the right to "reject any and all bids." This means, in plain English, that those who are to decide the letting of the contract will not be held as under any obligations to the competitors on account of the amounts presented, and the lowest bidder has no advantage unless his reputation for skill and honesty renders it advisable to give him the contract. As it usually happens that the most reliable builders do not present the lowest figures, the work for which such competitive estimates are made is usually given to the contractor to whom, taking all things into account, those having the matter in charge prefer to intrust it. This comes back very nearly to the same ground that would have been taken if the same contractor had been asked, without further ado, to name the lowest price at which he would be willing to undertake the work.

To ask a man to estimate upon a contract when it is determined beforehand that, by reason of his incompetence or lack of integrity, the work will not be assigned to him, is surely an insult to him and to the other competitors. Yet this appears to be done, and not infrequently, with the sinister purpose of reducing the estimates of those who are esteemed reliable. Especially does the feeling prevail that in all public works everybody should have an opportunity to make proposals, as though public works were a sort of bonanza in which all should have a share. Of course this is nonsense; the right management of public matters being precisely the same as that which a wise, just and far-seeing business man would apply in the conduct of his own.

While there is much that is disheartening to good builders in the usual way of managing contract work, a well-earned reputation for integrity and ability gives far better chances than the smartness that tries to secure an "inside" track by questionable means and the pretense of doing cheap work, which, in the end, is sure to prove the most expensive.—*The Builder.*

Painting is no Expense.

IT must be admitted that the Germans, the world over, are celebrated for their industrious habits, thrift and general economy, and they have a maxim that "painting is no expense." This theory, regarded in a comprehensive view, is undoubtedly correct. An occasional coat of paint on the outside of buildings greatly prolongs their durability, and upon a metallic surface prevents corrosion. It is a matter of doubt, however, whether board fences, on account of being exposed on both sides to the wind, and rain and sun, remain in a sound condition longer by receiving an occasional coat of paint. We have seen them not protected by any substance, standing after an existence of fifty years; and in one instance, the board fence—behind which a company of riflemen sought protection when it suddenly fired upon the Hessians engaged in burying the dead, after the close of the battle of Germantown, in the graveyard attached to the present Concord school house, this fence, which was on the ground of the late Peter Keyser, maintained its position, though very thin, with bullet holes worn to four times their original dimensions, seventy-two years after the battle, never having had, we learned, any paint upon it, as in fact, it was of rough cedar boards. How much longer it stood we are not informed.

Frame houses and barns are often painted dark colors, which are preferable to white in this latitude, as they have a tendency to absorb caloric and render the structures warmer than they would be if daubed with a light or white shade. The whitewashing of walls, fences and buildings produces a tone of neatness, but after a heavy rain or two the original faultless color is decidedly marred. Paint is more durable in its nature, and when applied to either buildings or farming utensils well repays the expense, and when they are refreshed by an occasional retouching of paint, it is a very decided benefit in appearance and wear, and we commend, therefore, with confidence, the advantages of painting, agreeing with the Germans that "it is no expense."—*Ex.*

MALLEABLE IRON CRESTINGS AND FENCES.

The Phoenix Iron Works of this City are agents for the celebrated Malleable Iron Crestings and Fences. The designs are perfectly original and are very beautiful. Send for circular.

Modern Architectural Designs. \$10.00.

A Formula for Calculating Architects' Charges.

THAT the present five-per-cent rule is inadequate, I think, evident. The problem is to find a rule which is more flexible, and, therefore, more easily adhered to and more just.

Other things being equal, the value of an architect's services should vary in some direct ratio with the amount of work in the building. Whether this consists of more elaborate decoration, or of more difficult construction, the comparative amount of work in buildings, apart from their size, is more or less closely determined by their cost per cubic foot.

Our first element, then, is this cost, denoted by R .

Experiment shows that to determine the ratio we may take the square root of the cost per cubic foot, as follows:—

Cost per cubic foot.	Square root.	Corresponding Building.
10 cents.	3.1 per cent.	Cottage.
15 "	3.9 "	Country House.
25 "	5 "	Apartment House.
35 "	5.9 "	Town House.
50 "	7.1 "	Public Building.

The column headed "corresponding building" is intended to give a very rough idea only of the class of building that costs about so much.

Putting C for the architect's charge, the formula now stands:—

$$C = \sqrt{R}.$$

There is another important factor, however, which must not be lost sight of. The larger the building the less it is worth to do the architectural work. That this is naturally and properly so is obvious. So that besides the direct ratio spoken of we have an inverse ratio with the size of the building.

Experimenting as before—the whole thing is purely empirical—we find that the cube root of the cubic contents of a building gives a proper proportion in which to reduce the charge with the size.

Cubic feet.	Cube root.	Inverse Proportional per cent.
50,000	36	5.4
100,000	46	4.2
500,000	80	2.5
1,000,000	100	2

Introducing this factor of size into the formula, denoting it by S , we have:—

$$C = A \frac{\sqrt{R}}{\sqrt[3]{S}}.$$

As a constant which must be arbitrarily determined, perhaps 50 is a fair value for it:—

$$C = \frac{50 \sqrt{R}}{\sqrt[3]{S}}.$$

That is, fifty times the square root of the cost per cubic foot in cents divided by the cube root of the cubic contents will give the proper architect's charge for full service— C being obtained as a percentage on the cost as at present.

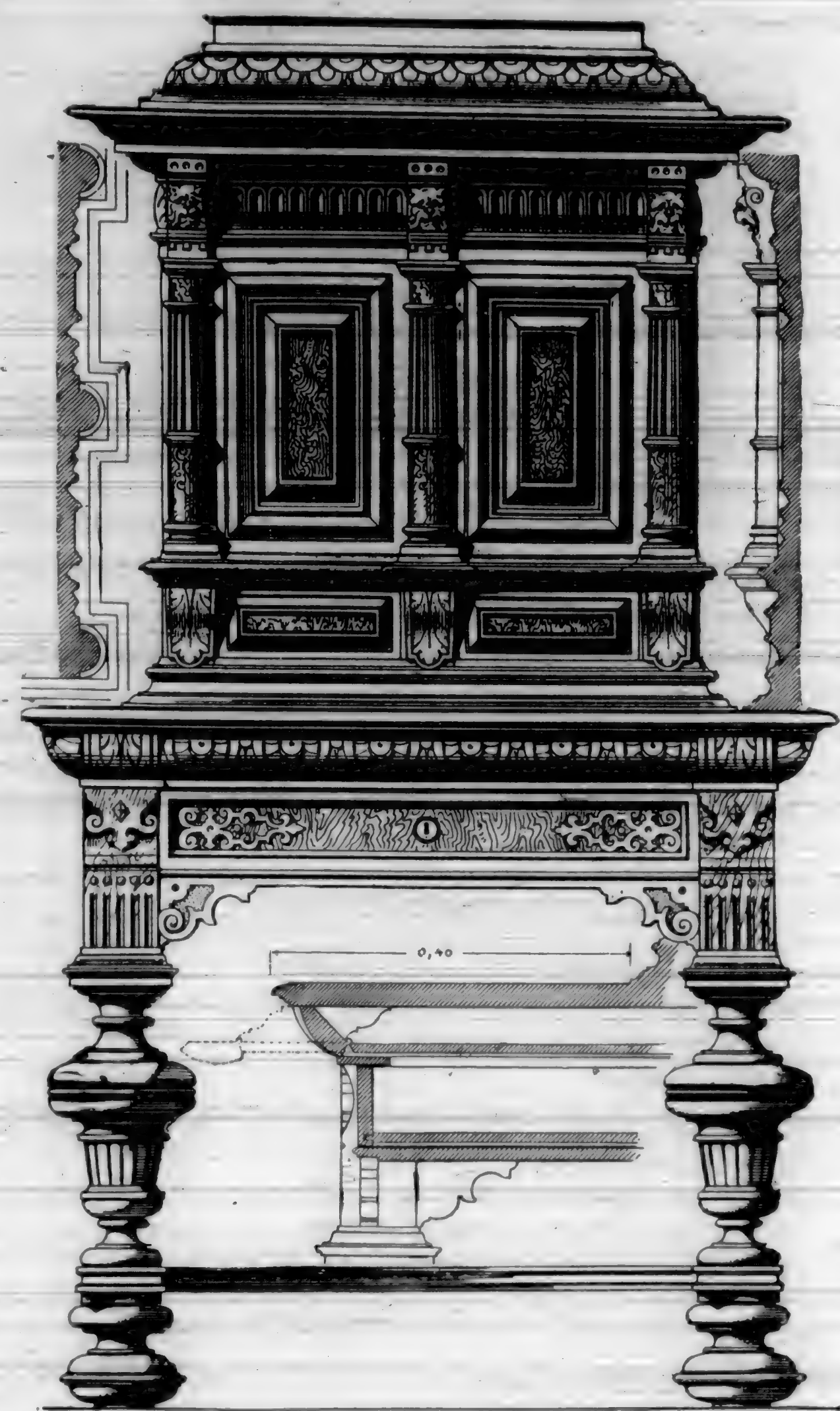
EXAMPLES.

I. Country house, $40 \times 30 \times 40 = 48,000$ cubic feet; cost, \$8,000 = 16.7 cents per cubic foot.

$$C = 50 \frac{\sqrt{16.7}}{\sqrt[3]{48000}} = 50 \frac{4.08}{36} = 5.66 \text{ per cent.}$$

II. Country house, $40 \times 60 \times 40 = 96,000$ cubic feet; cost, \$16,000 = 16.7 cents per cubic foot.

$$C = 50 \frac{\sqrt{16.7}}{\sqrt[3]{96000}} = 50 \frac{4.08}{46} = 4.43 \text{ per cent.}$$



III. Country house, $40 \times 30 \times 40 = 48,000$ cubic feet; cost, \$16,000 = 33.4 cents per cubic foot.

$$C = 50 \frac{\sqrt{33.4}}{\sqrt[3]{48000}} = 50 \frac{5.78}{36} = 8 \text{ per cent.}$$

IV. Town house, $25 \times 70 \times 60 = 105,000$ cubic feet; cost, \$35,000 = 33.3 cents per cubic foot.

$$C = 50 \frac{\sqrt{33.3}}{\sqrt[3]{105000}} = 50 \frac{5.77}{48} = 6 \text{ per cent.}$$

V. Public Building, $100 \times 100 \times 100 = 1,000,000$ cubic feet; cost, \$500,000 = 50 cents per cubic foot.

$$C = 50 \frac{\sqrt{50}}{\sqrt[3]{1000000}} = 50 \frac{7.1}{100} = 3.5 \text{ per cent.}$$

JOHN BEVERLY ROBINSON.

N. B.—The cost per foot is intended to include all interior decorations that the architect has nothing to do with, the separate ten per cent. on such work being abolished.
—*American Architect and Building News.*

Architectural Drawing, \$2.50.

Science of Carpentry, \$5.00.

Detail Cottage Architecture, \$10.00.

Builders' Guide, \$2.00.

Drawing and Shading, \$1.25.

MANY plunger-closets now in use, the *American Architect* remarks, are so constructed as to discharge suddenly into the soil-pipe at each use as much as four and one-half gallons of water. Under certain simple conditions, often met with in practice, such a discharge, even with the soil-pipe properly ventilated at head and foot, will produce an exceedingly powerful draught on the traps of fixture below. It will siphon out a $3\frac{1}{2}$ -in. pot-trap in thirteen discharges, or a 4-in. pot-trap in sixteen discharges. It will destroy the seal of a $1\frac{1}{2}$ in. S trap, $1\frac{1}{2}$ inches deep, and having a vent opening at the crown $\frac{1}{4}$ of an inch in diameter, in seven discharges. If a rubber tube, 9 feet long and three-fourths of an inch inside diameter, is attached to the vent opening, a single discharge will completely empty the trap. An S trap with a $1\frac{1}{4}$ -in. vent opening, to which is attached 16 feet of new $1\frac{1}{4}$ -in. (inside measure) lead pipe, will lose its seal under this test in four discharges.

American House Carpenter, \$5.00.

Modern Perspective, \$6.00.

Mechanic's Geometry, \$5.00.



External Architectural Decoration.

BY A. C. BOND.

THE art public has always had a voice in architectural matters. The influences operating to bring about a change from accepted styles, and the decorations bound up with these, are especially active in periods of transition, finally exerting their force in securing a general concurrence in some special order of development. The new taste created must be gratified, and architects, catching the spirit of the day, move with it. A study of the early architectural works in the clay plains of northern Italy led to the introduction of the *Renaissance* style, with its converging tendencies, and free appropriation of classic forms, with reference to picturesque effect.

We have had a succession of styles—Greek, Roman, Gothic, Louis XIV., Louis XVI., Elizabethan and Queen Anne. The latter two, which largely drew from classic models, often incongruously applied, and with a mannerism of their own, seemed to prepare the way for the *Renaissance*, which, without excluding classic orders, bears evidence of long continuance. Beyond any other style it lends itself to ornament.

Concerning ourselves, with the characteristic features of business structures, we first turn to porticos. As inlets to a building, they are of prime importance. A portico which appears as a mere attachment to a structure, not fairly incorporated with it either as to material, styles or mouldings, is very unsatisfying; still more so if it appropriates rich decorative features of which the *façade* is devoid. We naturally look for imposing porticos of great area and height, and with *façades* richly dressed. They are at once becoming and consistent, but instances exist in which, though

exteriorly mostly of the structures they adorn, the value of their decorative features is reduced by arch or lintel, not to speak of pediments, reaching far above the ceiling of a hall, possibly enclosing the windows of a principal apartment; they excite expectations of loftiness in the vestibule which are not realized, deceiving the eye as to inner construction, and to this extent are veritable shams. There is no architectural beauty in want of consistency or in announced inappropriateness. As well-considered porticos we may point to the Welles building, above the Bowling Green, the Williamsburgh City Insurance Co., the United Banks, the Boreel, and Iron and Coal Exchange buildings. The imposing appearance of the majestic portico of the Mutual Life, on the site of the old Post-office, on Nassau Street, and which is of two stories, is due in part to its vast proportions and classic design, and for the rest, to contrast of material and surface, as between polished blocks of granite, hewn granite, and rough stones. Large pieces of granite, with alternate blocks polished and fluted, and two polished granite columns with capitals of modeled leaf-work in Italian marble, support a frieze; the ceiling of this first story of the portico being paneled with richly moulded squares enclosing foliated rosettes. The piers of the second story are of limestone, contrasting well with the granite of the first story, and these are paneled and enriched with elaborate carvings; with these piers are ranged two granite columns, that support an arch with a vaulted paneled ceiling. The capitals of the flanking piers contain heads symbolic of Europe, Asia, Africa, and America.

Our architects, on the whole, use skillfully the freedom afforded by the *Renaissance* style in the treatment of the capitals of columns and pilasters. With greater variety we are getting more expression. In leaf designs they prefer a few stems boldly outlined, a few leaves with serrated edges, and projection of the bell to heighten the effect of the deeply cut moulding, free from unmeaning details.

It has at last been discovered that some of the commonest species of forms are not to be surpassed for elegance and refinement of form. A favorite ornamentation to shafts are bases of foliage, where the effect is obtained by mere contrast of convex and hollow leaves, and these are repeated in many instances on the cornices. There is a vast difference between the mere crowding of leaves on stone, and a style which preserves their most beautiful characteristics. Overwrought decoration is destructive of grandeur. Much is made of boldly projecting stems and concave lobes that yet preserve the form of the leaf.

Scroll work, leaf and foliage in bas-relief on panels, entablatures and friezes, do not alone content our architectural designers, who vary their ornamentation with allegorical monsters, grotesque and flattened visages and heads of animals, entangling also birds in foliage, and suffering reptiles to creep among the leaves of capitals. A monstrous griffin, projected from

the angles of what is known in financial circles as "The Fortress," guards the Broadway entrance of Wall Street. All these are, whatever the taste involved, at least welcome variations from monotonous renderings of more generally accepted forms. Included in *façade* mouldings, are medallion heads of individuals in some way identified with the building or its trade purposes; and corporate bodies, raising new structures, are availing themselves of the decoration afforded by corporate seals. Again, artistically designed monograms, in terra cotta or stone carvings, are coming into extensive use to enrich archivaults, architraves, entablatures, or door panels. These monograms are set frequently in floriated tracery, or on a geometric ground with which they unite in mazy, flowing lines, or the lettering is caught up in the tails of foliage or scroll work, or only half revealed.

External expression should be the apt exponent of the purposes of a structure. External as well as internal effect has been considered in all great developments of art. The Washington building, at the foot of Broadway, is typical of the large composite structures that are being erected, of brick, stone, iron, and terra cotta. Lofty pilasters, with projected leaf capitals, rise from above basement story to frieze in reposeful dignity, bearing carved mouldings, in terra cotta, in line with the principal longitudinal bands of terra cotta enrichments that mark off leading divisions of stories. These carvings, running under the tiers of windows, serve directly to ornament them and to emphasize the well-designed chamfers, whilst arches, in recessed brick, surmount them above the line of the capitals. The semi-circular windows, that, resting on corbels, project at the two southern extremities of the structure, are picturesque in the highest degree. The main entrance is a massive iron gate, composed of bars twisted into curved forms, with tapering extremities and apparently forge wrought. What a contrast does such a building offer to the old-style business house, with dingy and coarse brick front, or stone veneered *façade*, stereotyped form of Grecian porch, with windows that were merely apertures, or had only fillets, cap moulds, and possibly keystone panels—the building surmounted with an unpretentious cornice, and a parapet obscured roof.

The Morse building is a prominent example of the capabilities of brick work itself on ornamentation. The simple means by which decorative effects are brought out, whether in the disposition of the bricks or contrast of the simple colors, black and red, is a source of pleasure and gives character to the carefully elaborated design. Any terra cotta decoration is of the least obtrusive character, and has to be searched out. The dressings present, at every point, novel decorative features.

In the building of the National and Manhattan Bank, of New York, the contrast of surface as between the polished granite pilasters of the *façade* and the chiseled surface of oolitic stones, besides pleasing in itself, brings the pilasters out in fuller relief. This is one of



the most costly, as well as one of the most ornate, of recent erections, and compels admiration for the converging tendency of the design, the eye being carried up to the loftily-placed range of pilasters above the main cornice, repeating, in closer rank and in miniature, the forms of those below, and crowned by a pediment.

Occasionally we meet with an excess of ornament in a *façade*, in the form of panels, architrave, string-courses and heads of windows—an excess interfering with that repose which is so essential a condition for gratification. The *façade* of the Park Bank is one mass of ornamentation, unbalanced by sufficient wall space; the upper portion of Union Building is confusing and repelling, ignoring the main constructive lines, being hid by pretentious mouldings. Ornamentation, at the best, is but a subordinate feature.

The arrangement of decorated wall spaces is a great point in securing a good *façade*, such as will present enrichments to best advantage. In certain late erections may be seen two upper intermediate stories, almost wholly bare of mouldings, in order to heighten the effect of entablatures, cornices, capitals, and other ornamentations above and below. In a number of elaborated *façades*, the pilasters space off the height of two stories, which make leading deviations through a springing arch, ordinarily moulded between pilasters or piers, thus crowning the groups of windows enclosed.

In the Lincoln Safe Deposit building, the first story of stone is comparatively plain, whilst the second, containing the offices, has particularly rich mouldings. A mezzanine story answers the effect of a balcony, such as is seen in an Italian structure. From the balcony, the stories above the arches are more elaborate than the lower ones. Not only are longitudinal bands of enrichment made to differ, but a different form is frequently given to the separatetiers of windows, with excellent results.

With the loftier buildings now erected, the old dictum, that the ornament of a *façade* should increase with its ascent, loses its force; for elaborate ornaments to be fully effective, must be seen. The terra cotta entablature

of the Produce Exchange, with its floriated enrichments, distributed between the spans of the arches of the principal tiers of windows, including the arms of States, would have been a confused medley if elevated toward the principal frieze.

It might be well if architects, who indulge their proclivities for tower-like elevations, sometimes as in the case of Temple Court, crowning thereby pointed roofs, would bethink themselves of enlivening the sky-line with gilded weather-vanes, which have always a life-like aspect, and would appropriately constitute an aerial vanishing point. Chaucer, mindful of their appropriateness, wrote:—

"The towers his full playante shal ye finde,
With fanes fresh tuned turning with every winde."

WHAT IS DUE THE ARCHITECT.—*Building*. of New York, has in its May number an article on the relations of architects to the owner of property to be improved. The article upholds the right of the architects to just compensation for all services rendered, and deprecates placing him on the same plane as the contractor or material man. It says: "The true view of the relation that should exist between the architect, owner, contractor and the men who furnish material, can be set forth in a few words. An architect is the agent of the owner—his confidential agent. It is his duty to stand between the owner and the contractors and the material men. In every natural contest with the builder (a contest that is inevitable while human nature remains as it is), the architect should naturally be found on the side of the owner, whose interests he is engaged to protect. Owners should reflect that if they go to architects who work for low commissions, they do not save anything in the end. The chances are that heavy discounts, which should accrue to them, go to help swell the low commission, in addition to which the contractor very likely has levied a commission on the work that he pays to the architect. What a contractor pays an architect, aside from the *morale* of the latter's receiving it, is bad for the owner because it must come from the work itself."

THE DOOMED CHESTNUT.—A Scientific authority claims that the chestnut tree, which is disappearing so rapidly, has a fixed period of evolution. This tree, like all others of the spongy inferior fibre, cannot flourish before the close-fibred trees, such as the oak. In ancient times a rank, quick growth covered the earth, which yielded, as the ages went, to the stouter trees. Thus it is the chestnut is doomed in the operation of the same law.

Wheeler's Patent Wood Filler.

WE notice in recently issued copies of specifications prepared by various architects, that the above Filler is called for in the proper place, thus assuring the general public that it has become a standard preparation. We can indorse this Filler as one of the very best yet brought to our notice. It is kept by every dealer in paints and oils throughout the Pacific Coast.

Nineteenth Industrial Exhibition of the Mechanics' Institute.

WE have received the preliminary announcement of the Fair to be held under the auspices of the above named institution. From the circular received we glean the following facts:—

The Fair will be held in the building owned by the Institute on the block bounded by Hayes, Grove, Larkin and Polk.

It will open August 5th, and close September 6th. Premiums of Gold, Silver and Bronze Medals, as well as cash, will be offered as set forth in the Premium List.

Seven thousand five hundred feet of additional space will be added to the main floor for the display of machinery. It is intended to make this department one of the distinct attractions.

A grand fountain and cascade of original design thirty feet in height, will be erected in the center of the main nave.

Art galleries are to be remodeled and improved in regard to natural light, and it is intended that the display of home and foreign artists will far exceed anything ever before seen in this city.

Each afternoon and evening a grand instrumental concert will be given by the best musical talent on the coast.

Ample steam and water-power will be furnished free.

It will be seen from the above that the managers are determined to do all in their power to make the present Fair the most successful that has, as yet, been held by the Institute.

We would especially call the attention of manufacturers, inventors, artists, farmers, merchants, producers and dealers in goods, wares and merchandise of every description, to the advantages offered by this opportunity to display their various articles, so that they will be seen by a larger number of people than they could possibly be by any other arrangement.

To all exhibitors we would say, HAVE YOUR SPACES FILLED AND FULLY ARRANGED ON THE OPENING NIGHT. Any information will be cheerfully given by the Secretary, J. H. Culver, 31 Post Street, S. F.

"Manual for Furniture Men."

A NEW WORK.

THIS book contains hints and practical information for cabinet makers, upholsterers, and furniture men generally. Also a description of all kinds of furnishing with full directions therefor; varnishes, polishes, stains for woods, dyes for woods, gilding for silvering, receipts for the factory, lacquers, pictures, engravings, etc.

This work will be found to be of great help to the class mentioned, and its price has been kept down to such a point as will not be beyond the means of the average workingman.

Sent post-paid to any address upon receipt of ONE DOLLAR.



Building Contract.

S sued B for \$492.60, the balance due him for building a two-story brick house, and B made a counter claim for defective material thrown out, and money expended in repairing the unskillful work of S. The contract price was \$2,535, and the plaintiff had been paid \$2,042.40; the counter claim was \$1,985, which the defendant got a judgment for. The defense to the counter claim was a most novel one: That the plaintiff had "no experience in laying foundations, as the defendant knew." The case - *Sherman vs. Bates* - was carried to the Supreme Court of Nebraska, where the judgment was affirmed. Judge Maxwell, in the opinion, said: "A party entering into a contract to construct a building thereby agrees that all parts of the structure shall be put up according to the agreement. As a defense to inferior workmanship he cannot say, 'I am not a mason, or a carpenter, or a tinsmith; therefore I am not liable for defects caused by unskillful or careless workmen.' The question is not one of skill on the part of the contractor, but of compliance with the contract. If a contractor agreed to erect a building in a certain manner, he must comply with the agreement, and no plea of a lack of skill of himself or any of his workmen or sub-contractors will constitute a defense for a failure to comply with the contract."

BUILDING SUPERINTENDENCE.

A NEW WORK AT A NEW PRICE.

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How to Boil Linseed Oil.

THE *Carriage Monthly* gives the following directions, which may be of service to some of our readers: First, be sure that you have the pure linseed oil. There is much sold as such manufactured out of peanuts. The test is simple. Nut oil has a sharp, acid taste, smells just like sour peanuts, is darker and thicker than the other oil, has a clinging tendency when rubbed on the finger, dries with a gloss even in priming coats, and is very much given to gumming up when sanded. Pure linseed oil has a bright amber color, runs freely, sparkles when flowing from the can, tastes smooth and mild, and has the smell of a flaxseed poultice. When you are satisfied that you have the genuine oil, and wish to boil it thoroughly, first take, say, about $\frac{1}{2}$ pound of red lead and the same quantity of sugar of lead; put into 5 gallons of the oil, and place over a slow fire, so as to boil evenly. Do not let your fire get either too hot or too low; keep an even temperature if possible; coke or charcoal is preferable to either hard or soft stonecoal. Avoid a wood fire, as, after the oil gets to boiling heat, a sudden flame shooting up might ignite the entire lot. Let it boil seven hours full; the red lead and sugar of lead will then become dark brown. Stir all the time while boiling slowly, and only one way; do not change the direction of the stroke or you will burn the oil, just as you would starch. After you have taken it from the fire, cover it up and let it stand to cool off, say, over night. The sediment will settle; pour out the oil and strain; your oil is boiled, and a better article you could not have, as all the fatty substances are destroyed. This is the English method, used in all the carriage factories in the United Kingdom.

Sawdust in Plastering.

TWO WESTERN inventors have recently obtained patents for the use of sawdust, instead of sand, in plastering compositions, and this, it is conceived, may be a matter of considerable importance to the owners of saw-mills in the principal lumbering towns. One of the patents is for the use of nearly equal parts of plaster-of-Paris, or cement, and sawdust, with the ordinary amount of plastering hair and water; the other calls for the use of about $4\frac{1}{2}$ pounds each of slaked lime and sawdust to one pound of plaster-of-Paris, a quarter of a pound of glue, and a sixteenth of a pound of glycerine, with plasterer's hair. Whether or not either of these described plasters would be cheaper than those made in the ordinary way, they would certainly be lighter, and it is believed that they would better adhere to the walls, and not be so liable to chip, scale, and crack. Sifted sawdust has before been used to some extent, by experienced workmen, for mixing with mortar for plastering external walls, exposed to the alternate action of water and frost, as a preventive of scaling. Certainly the experiment of introducing sawdust in place of sand in mortar is worth trying, for in many places, sharp sand, suitable for the purpose, is difficult to obtain.

Superiority of Country Workmen.

THE *Scientific American* calls attention in a recent number to the superiority of the workmen trained in small machine shops and factories over those bred in larger establishments, where the division of labor, and limitation of the responsibility of individuals, prevent the development of that self-reliance and ingenuity in overcoming difficulties which those compelled to make the most of imperfect tools and to turn their hands to a variety of work, are constantly obliged to exercise. For this reason, the mechanic who has learned his trade in a shop where only two or three men were employed is generally very welcome in the larger ones. Although the costly machine-tools of the great establishments are new to him, and some time may pass before he learns to use them properly, he generally succeeds at last in understanding them far more thoroughly than those who have not been accustomed, by the invention of homely make-shifts, and contrivances for using common tools in unusual ways, to acquaint themselves with the properties and capabilities of the parts which they find combined in a new form. Most architects have probably had occasion to make the same remark in regard to builders' men. The man from the small shop, particularly in the country, is commonly quick, ingenious and reliable. He may in some instances be less skillful with his tools than the city workman, who is not obliged, like him, to turn to other employment during a large part of the year; but he more than makes up for that in his better mental development, which enables him to enter into the ideas of the architect, and to seize opportunities for advancing or improving the work, which his plodding brother from the great shops would not see or care for.

Burning Sewer Gas.

THE *Chicago Tribune* contains an account of what it considers to be a novel method of disposing of sewer gas—namely, the burning it in the furnace of the steam-boilers of a factory. The reporter states that he saw the natural sewer gas burn at the end of the pipe connected with the sewer for nearly ten minutes without a flicker. The Chicago Gas Company, which has pipes in that vicinity, had better have them examined.

This method of disposing of offensive gases from sewers is one that has been many times suggested and in a few cases tried. In exceptional cases it may serve to dispose of a local nuisance, but it is not generally applicable, as is well known to all who are acquainted with the experiments made in London on this subject by competent engineers.

Where there is a leaky gas-pipe in the vicinity of a sewer, the air of that sewer may contain combustible elements, but in this case there is usually an explosive mixture formed; and this is the true explanation of the majority of the explosions which are said to be due to sewer gas.—*The Sanitary Engineer.*

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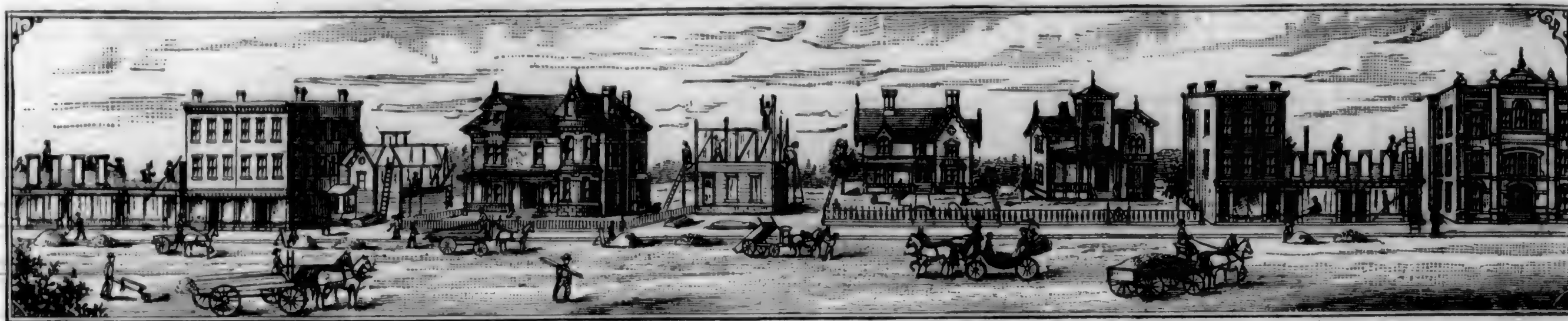
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Woodland—Main Street. Alterations. O. and B. G. W. Myrick; \$1,400. South Woodland. One-story frame. O. W. Gibson. Day's work; \$1,750. North First Street. One-story frame. O. Mrs. Hollingworth; C. Glenn & White; \$2,200. Second Street. Woodland Opera House. Three-story, brick and iron. A. T. J. Welsh; C. brick work, D. S. Scott; C. wood, W. H. Curson & Co.; \$28,000. Second Street. One-story frame, O. J. Freeman; C. W. H. Winnie; \$1,500. Two-story frame. O. Hoppin Brothers; C. W. H. Winnie; \$1,000.

Madison. Two-story frame. O. J. E. Dearing; C. C. Reardon; \$3,500.

Oakland—Jefferson. Fourteenth. Two-story frame. O. W. Blotte; A. W. P. Moore; C. W. G. Reese; \$2,500. Sixteenth, cor. Grove. Two-story frame. O. D. Alyn; A. W. Kirk; C. Nolan & Govney; \$3,000. Castro cor. Nineteenth. One-story frame. O. M. Heney; \$1,500. Brush, cor. Nineteenth. One-story frame. O. C. W. Blackman; day's work; \$1,800. Market, nr. Sixteenth. Two-story frame. O. J. S. Beardslee; C. Knight & Littlefield; \$2,500. Fifteenth, nr. Market. Alterations. O. D. Coakley; C. Markell & Griffith; \$1,500. Filbert, nr. Sixteenth. Two cottages. O. Capt. Wrinkleman; A. C. Mau; C. W. Dahl; \$3,000. Chestnut, nr. Fourteenth. One-story frame. O. F. Kellogg; A. W. Kirk; C. W. Brophy; \$1,800. Magnolia, nr. Tenth. Two-story frame. O. G. M. Fisher; C. Knight & Littlefield; \$4,400. Thirteenth, cor. West. One-story frame. O. A. Bassett; A. C. Mau; C. W. Dahl; \$2,500. Tenth, nr. Franklin. Two-story frame. O. W. Collins; A. C. Mau; C. R. Smilie; \$3,000. Thirteenth, cor. Clay. Two-story frame. O. Dr. Tisdale; A. C. Mau; C. Ingerson & Gore; \$15,000. Union, nr. Fourteenth. Two-story frame. O. Mrs. Davidson; A. S. and J. C. Newsom; \$3,500. Repairs to public schools. A. S. and J. C. Newsom; \$5,000.

San Mateo—Two-story frame. O. Isabel Jordan; A. W. G. Copeland; C. R. Wisnom; \$3,000.

San Jose—Two-story brick building on north side Santa Clara St., nr. San Pedro. O. John W. Lyndon, of Los Gatos; A. Theo. Lenzen; C. Kenny & Leddy for brick work and E. A. Van Dolsen for carpenter work; \$23,060. The building heretofore reported for Chas. Lefranc has been enlarged to a three-story and basement brick; A. Theo. Lenzen; cost complete, \$34,000. NW cor. San Fernando and Third. Two-story brick. O. Joseph Balloli; A. Theo. Lenzen; C. brick work, L. C. W. Otto; \$3,000. Additions. O. Mrs. Krakenburg; A. Theo. Lenzen; C. C. Curdis; \$1,000.

Alameda—Alameda Avenue, cor. Oak. Alterations. O. J. Maistaney; A. C. Mau; C. Foster; \$3,000. Two-story frame. O. P. Otis; A. Wright & Sanders; C. Martin; \$6,000.

Watsonville—Country home. O. G. R. Ford; A. Townsend & Wynekin; C. C. Mills; \$3,000.

Centerville—Two-story frame. O. C. A. Plummer; A. S. and J. C. Newsom; C. F. A. Larabee; \$5,000.

Stockton—Two-story frame. O. W. Sweat; A. S. and J. C. Newsom; day's work; \$3,500.

Eureka—Two-story and basement frame. O. W. Carson; A. S. and J. C. Newsom. Day's work; \$25,000.

Oakland—Railroad Avenue, cor. Peralta. Two-story frame. O. E. Flynn; A. T. J. Welsh; C. M. Berger; \$3,000.

Woodland—Two-story Opera House. O. Woodland Opera House Association; A. T. J. Welsh; \$25,000.

Alameda—Railroad Avenue. Two-story frame. O. C. Montgomery; A. Schmidt & Havens; C. T. Adams; \$10,000.

The California Architect and Building News.

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Advertisements inserted for three months or less are payable in advance; payable quarterly when inserted for a longer period.

When money is sent for subscriptions, the receipt of a copy of this journal is an acknowledgment that it has been received. Unless requested we do not send receipts.

A Fine Showing for June.

JUNE is generally regarded as a quiet month in building activities, but from the summary of our building intelligence, the month just past has been an exceptionally active one in regard to the number and value of contracts let. We find during the month

EIGHTY-SEVEN BUILDINGS OF THE VALUE OF \$663,909.

Have been commenced. This amount does not include several upon which work has been started, the most notable exception being the Murphy Building on corner of Market and Jones Streets. As only a portion of the contracts have been let, we refrain from quoting the same until we can give definite cost. From present appearances, the value of building improvements for 1884, will exceed any year of which records have been kept.

Our Illustrations.

THE fine four-page engraving presents an accurate illustration of the New Odd Fellows' Hall. Its cost will be about \$300,000. Wright & Sanders, architects.

The elevation and plans for a country residence recommend themselves to those who want a neat, but yet attractive, country residence.

In our next issue we will present the first of our competition plans, the plates of which were not ready for this issue.

San Francisco Chapter, American Institute of Architects.

THE regular meeting of the Chapter was held on Friday evening, July 11th. President John Wright in the Chair.

The following amendment to the By-laws was proposed: In Article XI, Sec. 1, the word "three" be changed so as to read "five," the object being to have five Trustees instead of three.

(This change is necessary on account of the State Law requiring the number of Trustees in an incorporated body to be not less than five. ED.)

Mr. A. A. Bennett was unanimously elected a member as a Fellow.

F. Marion Wells was proposed as an honorary member of the Chapter. Referred to Messrs. Pissis, Curlett & Whittemore as a committee to report at next meeting.

Various bills were ordered to be paid.

Adjourned.

SPECIAL NOTICE TO MEMBERS OF THE CHAPTER.

At the next regular meeting of the Chapter, to be held on Friday evening, August 1,

NOMINATION OF OFFICERS

For the ensuing year will be in order. It is earnestly hoped that all members will so regulate their affairs, that they can be present at the August meeting.

Carmel Mission Church.

THE attention of our readers is directed to the *Editorial Correspondence*—as given below—in which will be found a statement concerning the *virtual destruction* of a very large proportion of the *primitive ideas* of architecture and construction as practiced by the Pilgrim Fathers to the Pacific Coast, in the erection in the valley of Carmelo, near the shores of the bay bearing that name, of the church edifice, which, in its primitive periods, stood alone in that vast wilderness—at that time scarcely known even to the best informed of civilized people, where the untutored and semi-savage tribes of Indians and herdsmen alone entered its portals as devotees—until by the events of time and nature, those who there first chanted the praises of the Most High, and their successors in the order of their existence, together with the humble worshipers who assembled within the sacred walls of the old sanctuary, have passed away, and the sacred edifice itself yielded to the waste and wear of the elements, until its ruins only remained as a relic of what was once the temple of worship.

The many interesting facts surrounding the history of this old mission church and the devoted men who laid its foundations, and whose earthly remains lie entombed within its walls, has made it one of very extended and general interest; and anything that may be done, which in any unnecessary manner is calculated to mar or destroy the original, will be looked upon with sorrow and regret by all those who venerate the monuments of history.

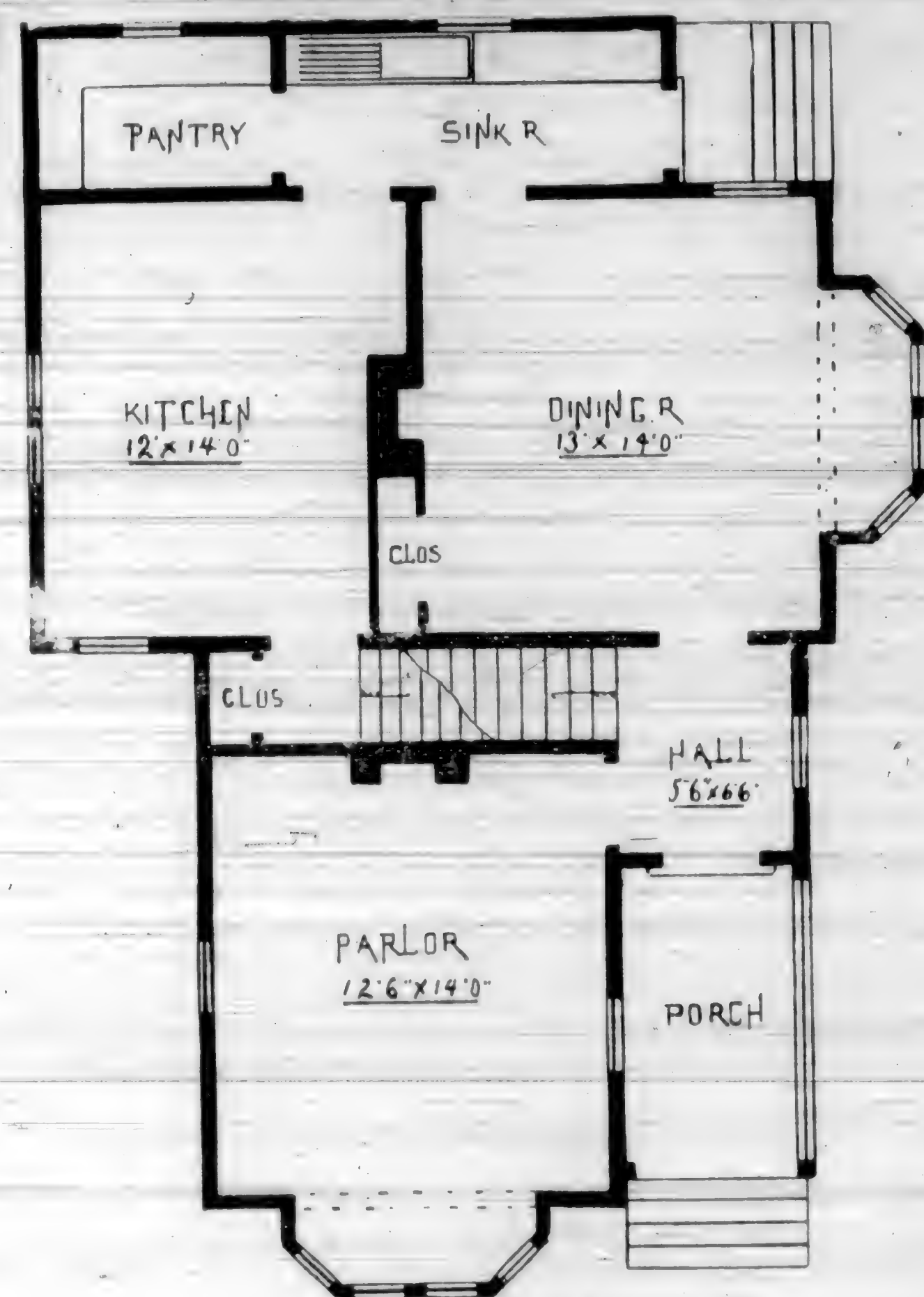
Editorial Correspondence.

SAN JOSE, Cal., July 8, 1884.

DURING our fourteen days' ramble through parts of Monterey, Santa Cruz, and Santa Clara Counties, we have met with nothing of more than ordinary interest.

AT HOTEL DEL MONTE, our stay was pleasant, and the usual conditions of comfort, elegance and high prices prevailed. There was a goodly number of guests present, but nothing approximating a crowded condition of things during the month of June, although a large increase is anticipated for July.

AT THE TOWN OF MONTEREY, the spirit of non-progression, apathy, and lack of enterprise,



FIRST STORY PLAN OF COUNTRY RESIDENCE.

Wood Pulp.

It seems that this monopoly has had sufficient rest, and the subject should be discussed at greater length, as in our last article we merely gave a few hints concerning the transformation of wood into paper. Since then, however, we have made an extended visit—a professional one—to one of the largest concerns of this kind in the world, and, though not feeling disposed to mention names, for fear of the article being termed a write up, we will mention what we saw, and view the process from a technical standpoint.

First of all, the wood is cleverly deprived of its epidermis—here we detected a waste which is to be utilized in the future—and, though poplar is the principal timber used, we can find considerable bass-wood and a few sticks of soft maple in nearly every pile. The operation of transforming wood into paper can, with propriety, be divided into three processes, the first of which is purely a mechanical one of making the wood fine. Some mills do this by means of cutters acting on the principle of a planer, but the larger establishments are supplied with grinders which operate across the grain of the stick, reducing it to a pulpy like mass. This is much the better process, though the old way of chipping has many champions. After the wood is reduced to the required degree of fineness, the chips, or pulp, is put in the digesters, which consists of upright boilers, from six to ten feet in height, according to the depth of the first story of the building in which the operation is carried on. Under these large boilers, or “digesters,” are the furnaces, while above and behind them are situated the alkali vessels,

made of iron, which contains strong caustic soda. Each of these alkali tanks is supplied with the proper fixtures for regulating the flow of the liquor, in which the wood is subsequently boiled, or “digested.”

When one of these digesters is ready for its charge, the top is removed, the faucet in the alkali pipe opened, allowing the alkali to flow in the digester and become thoroughly mixed with the wood as it is being put in. When the digester is filled in this manner, the faucet is turned to stop the flow of alkali, the top of the digester is replaced and firmly fastened by stirrups. Fire being applied, the entire mass is soon boiling vigorously, but the steam pressure is allowed to reach 100 pounds only. In this manner the wood is reduced to a pulp as soft as the finest jelly, every observable trace of its original appearance having disappeared. When this process has been carried to sufficient length, the contents are blown off into strong iron tanks with a capacity of withstanding with safety the pressure of the digester's steam. Then the pulp cars, which are simply large vats, receive the mass. These are supplied with perforated bottoms, and mounted on wheels, each car having a capacity equalling that of the tank adjoining. The surplus liquor is strained off into receiving tanks, and the pulp is treated to clear water, which is allowed to flow through it until all traces of the soda are removed. Every particle of soda is reclaimed and re-used in another batch. These pulp cars or tanks are now run out on turn-tables, from which they are taken to the tanks to be thoroughly mixed with clear water, which is done in a properly constructed mixing box. From here it is run into pulp dressers,

where every bit of undigested wood is separated from the rest by filters. From the dressers it comes in the form of large sheets, and is immediately torn up and thrown into the bleaching engines, where, through the action of chlorine—in one factory made from the smoke—it is freed from every particle of coloring matter, and left creamy white.

At another establishment, nearly all these conveyances are dispensed with, the mass being pumped through pipe lines from one place to another as needed, one factory transporting in this way from one building to another, some of which are over three miles from the rest.

At this stage the process is virtually complete. From the bleaching engine the pulp is run into the drainers—large reservoirs in the basement, where all traces of chlorine are washed out. Thrown out with these, the pulp is once more mixed up with clear water, and after passing through a second set of pulp-dressers is run through an eighty-four-inch cylinder machine, and over nineteen driers, which convert it into a strong, thin sheet, resembling blotting paper, except the surface is harder and smoother. From the driers it is wound on a long reel, and from the latter it passes between knives that divide it longitudinally into three strips, each of which is wound on a cylinder into a roll of about 118 pounds weight. This roll is now done up in heavy wrapping paper, and in this manner is shipped to the dealers or consumers. Some of our larger dailies buy direct from the factory, one mill in northern New York being kept running constantly to supply the editions of the *Times* of the American metropolis.

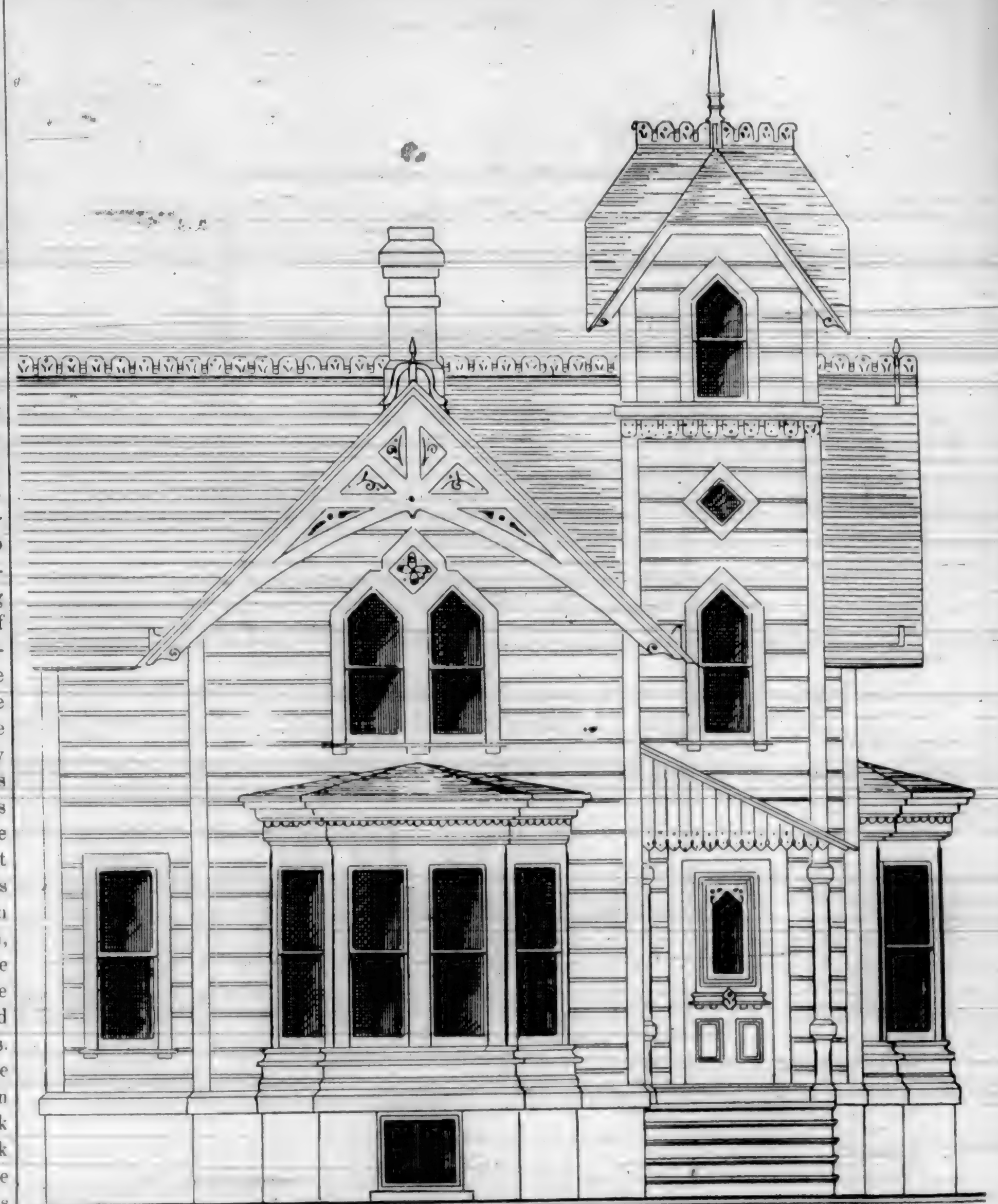
As this industry grew in importance, competition sprung up, and, of course, the cost of making the paper had to be reduced, and the process of reclaiming the chemicals was investigated, and now is a very interesting operation, as also the making of caustic soda.

When the pulp has been reduced in the digesters and drawn off into the pulp cars, as before stated, the liquor is drained off, and clear water allowed to percolate all through the mass, thoroughly washing out all traces of soda. This liquor that drains off is the original caustic soda mixed with coloring matters and other elements in small proportions, boiled out of the wood. The after washings are also impregnated with the same elements, but weaker. All this matter is pumped into the evaporating rooms, in which are four furnaces, fitted up with a large evaporating pan, so adjusted that the flames pass near them on their way to the chimney. The hot gases are still further utilized before escaping by passing over another set of pans higher up. The liquor is pumped into these upper pans first, where some of the water is evaporated. It is then allowed to run into the furnace pans where the balance of the water is evaporated and the remaining vegetable fiber burned out. There is now left nothing but the black soda ashes, which is now dumped on the ground to dry.

In the alkali house are tanks, into which are put water, the black ash, and a small portion of lime and white ash. Steam is applied, and the mixture thoroughly boiled until converted into caustic soda, which is simply the hydrate of soda, or, in other words, soda held in solution by water. It is now run off into vats, and left standing twelve hours, or long enough to clarify. A residuum sinks to the bottom, which consists of lime and the coloring matter of the black ash. The clear liquor is drawn off, and is ready for re-use in the digesters. The precipitate is thrown into other vats, and water run into it to absorb any remaining soda, a process now repeated many more times than previously.

The Art of Graining.

THE imitation of wood is now, more than ever, a very important study, as in nature, so we find it in art, there are many diversities in effects. There is great beauty in the natural woods, when selected for any given work, but their cost being large, forbids the general use in dwelling houses. In art we have every opportunity for variations, and this can be done without very great outlay of money to procure them. The embellishment given in first-class graining to new dwellings, is far more cheerful than we find in native woods. The reason it is so, is because the woods generally selected are too strait in the grain, and do not offer much variety to please the taste. And then when old work is to be renewed, a different style of woods may be substituted for the old, and thus add new work, cheerful to the observer, for all are pleased with a change. So we find it in our private and public buildings, in all household furniture. It is not long since the latter was made of lighter shade of woods, but now we live in the *black-walnut-age*, for the taste for dark woods has become the “ne plus ultra,” and nothing can please but walnut woods of every shade. On the Pacific Coast there has been a little variety thrown in by the use of laurel panels, veneers here and there of this beautiful wood, and has in a measure softened the general effect of the mournful aspect. For the coming student painters, there is an art study of the various woods and their proper imitation. There is in walnut wood many characteristics of its own, and these are the studies which must fit the student for his profession. He must note the sap growth of the wood in its sweeps and curves, along with the knots and their shades. The heart growth, for specialties should be carefully studied, as their true representation is one of the best effects in the art. In oak likewise there is a great diversity of the work of delineation in the heart growth, from the nucleus or knots to the spreading wavelets, as they reach out to panel ends or the length of rails to stiles. The roots and branches claim a large share of the student's time. The former are now more generally used in panel decoration, for they offer an endless variety in design of every fantastic shape. They are whirling pools of color scattered amid rocks and foam in lights and shadow in a perfect sinuous sea of mottled masses. The branches of either walnut or oak are very pretty in form, showing curving feather-like lights, with sweeping outward, over-grain in fine lines blended in the same direction, which enriches the work on the dark back-ground of color. The oak lights form a fine study, for there is a beauty in the scattered forms, irregular in size but in marshaled ranks, forming hollow squares, platoons or files still all marching on. The stave lights, when chamfered on panel, offer fine effect, making light and effective graining. Then the heart growth shows the pores or checks of oak and walnut. In the oak the checks are stippled in after the heart work is

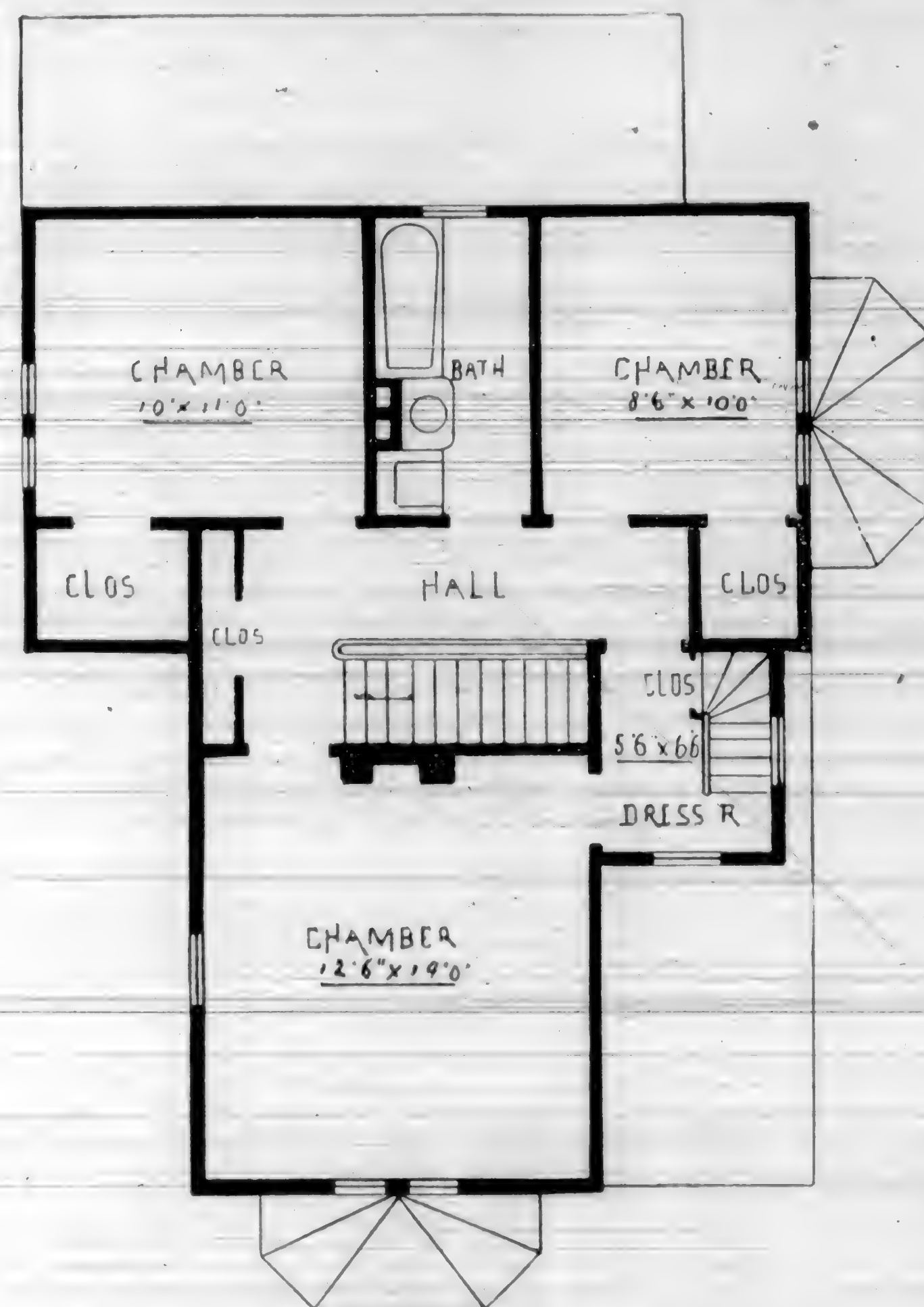


FRONT ELEVATION OF A \$3,750 COUNTRY RESIDENCE.

done, while the pores in walnut are laid in distemper flogging, and when the oil work is done over it, the stipple shows itself plainly in the heart-growth flashes of light, where the walnut pores are so commonly seen. These are some of the studies which fit the learner to do artistic work, for he must know all the characteristics of a wood, before he is competent to undertake a job of work. Should the pupil find an opportunity to learn of a practical grainer the rudiments of the art, he will save much time and secure these aids to further perfect himself in this beautiful art. In learning the modes of others, he must not forget that nature is the style he must copy and aim to represent it in all its technicalities. Some grainers have a style of their own, copied partly from others with ingenious additions of their imperfect studies, which serves only to make show work. Graining, when done for the

trade, is none of this class, imitation not being the rule, but rather color in marketable shape. To grain in imitation of any given wood, skill and labor of long experience are required to properly represent them. *Time-work* is more proper for the best execution of good graining, and for that reason all work of this nature should be done by the day. In order to encourage the study of the art, I propose to treat the subject in a practical way in a future article, in which the rudiments and color mixing, will be discussed. J. E. W. C.

An improvement has been effected in wooden block flooring. The common manner of laying the block flooring often results in disappointment, because the blocks soon become loose. The improvement consists in the blocks being keyed to a cement flooring, firmly fastening them, and the cement obviates both dampness and dry rot.



SECOND STORY PLAN OF COUNTRY RESIDENCE.

Building Skyward.

A BILL introduced in the Assembly by Mr. Howe provides that no dwelling-house hereafter to be erected in this city, shall be more than 70 feet high, if the street or avenue on which it stands is not more than 60 feet wide, and that the height shall not exceed 80 feet on any street or avenue of greater width.

The lofty apartment houses and office buildings in which millions of dollars have been invested on this island within a few years are among the curiosities of New York. The city can grow freely in only one direction. For this reason building sites below Central Park, in the building district and along Broadway and the central avenues, have become so costly that those who own them have been led to build skyward in order to secure the greatest possible rent from every square foot of ground. They have not been restricted by laws like those which have been enacted in cities of the Old World, but the day will come when such laws will be needed here to insure the protection of life and the preservation of health. The natural limits of expansion have thus far tended to give builders more freedom than is allowed in cities that can grow outward in

all directions from a center. If Berlin were growing from one end of a long and narrow island toward the other, the authorities of that city might have postponed the adoption of a regulation forbidding the erection of houses more than 79 feet high. If Paris could expand in only one direction, the height of its buildings might not be limited to 65 feet, with exceptions in certain cases. Admitting, however, that freedom in this respect is more desirable here than in those cities, it is, nevertheless, true that the time has come for the enforcement in New York of some law like that proposed by Mr. Howe. The subject is receiving attention in Chicago, where the erection of a few lofty buildings has led an association of citizens to ask for the enactment of an ordinance providing that all buildings more than 90 feet high shall be made throughout of incombustible material.

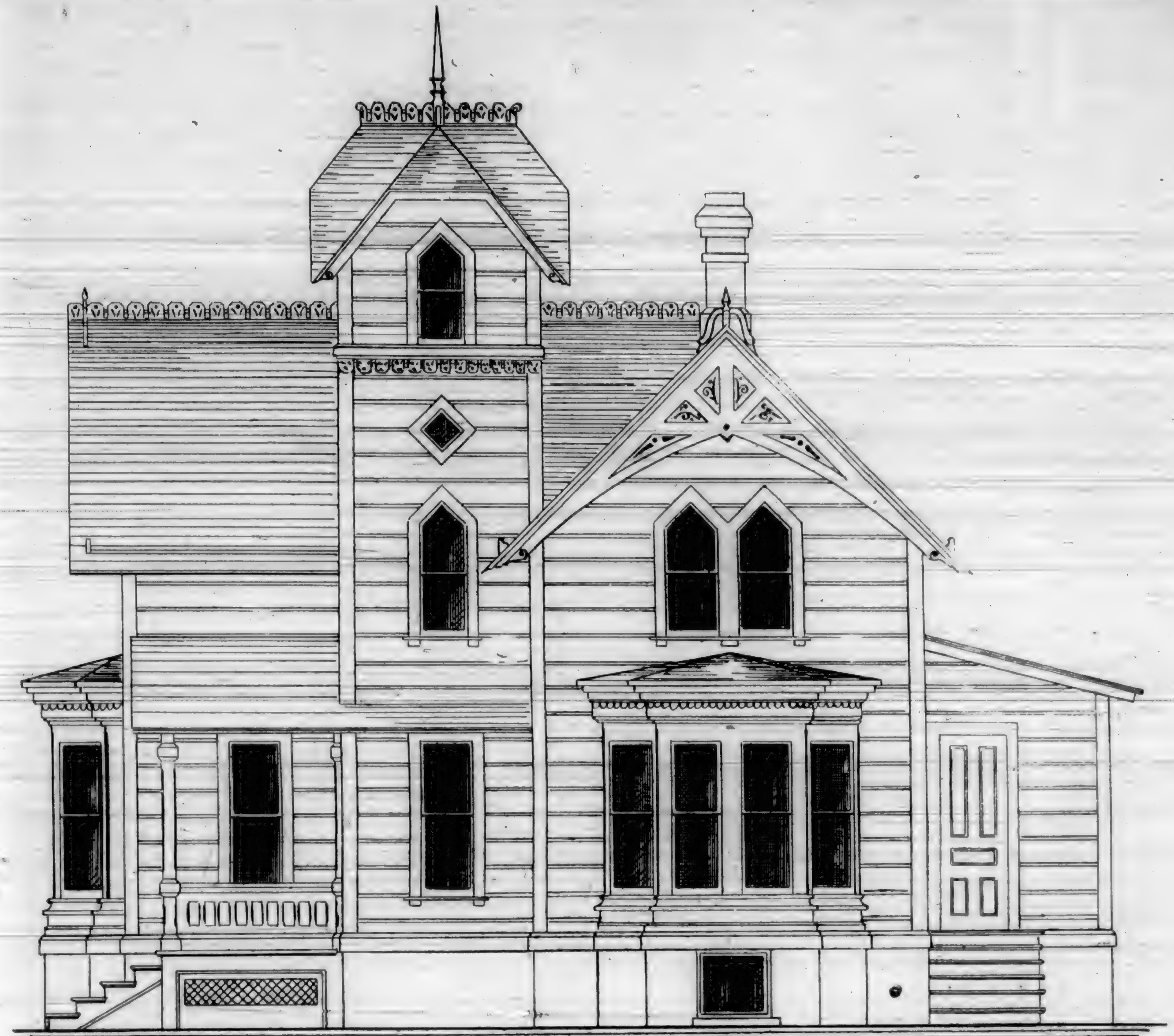
The builders of our most lofty structures—apartment houses and down-town office buildings—have in most cases been led by a consideration of their own best interests to make them fire-proof. A law that would prohibit the erection of such buildings as half a dozen that might be named, recently constructed below the City Hall, could not be defended by

many arguments, nor could the erection of lofty fire-proof apartment houses, like those that now attract sight-seers near the lower end of the Park, be reasonably forbidden upon the sole ground that fire in them might endanger life and surrounding property. The buildings which we have in mind seem to be practically fire-proof, but the erection of buildings eight, ten, twelve, and even fourteen stories high that are not fire-proof should be forbidden by a rigid law. If a builder desires to increase his profits by erecting sky parlors, he should be at least, compelled to make his sky parlors safe.

On the ground of health, however, it is urged that the erection of all lofty buildings—even those that are fire-proof—should be forbidden in a crowded city. This objection may not be potent with reference to office buildings, but with reference to apartment houses it demands serious consideration. Nearly all of the great up-town flat houses now stand apart from each other. Where two or more of them are grouped the lower floors are almost sunless, and in the course of time the multiplication of these houses will convert the lower stories into gloomy caverns which the sun's rays cannot reach. They will keep the surface of the streets in almost perpetual shadow, and deprive the unfortunate occupants of adjoining small houses of sunlight, which is so powerful an agent for the preservation of health.—*New York Times*.

To Saw Rough Timber.

ALL tough timber, when the logs are being sawed into lumber of any kind, whether scantling, boards, or planks, will spring badly when a log is sawed in the usual manner, by commencing on one side and working toward the other. In order to avoid this it is only necessary to saw off a slab or plank, alternately from each side, finishing in the middle of the log. We will suppose, for example, that a log of tough timber is to be sawed into scantling, of a uniform size. Let the sawing be done by working from one side of the log toward the other, and the ends of the scantling will all be of the desired size, while at the middle some of them will measure one inch broader than at the ends. After the log has been spotted, saw off a slab from one side; then move the log over and cut a similar slab from the opposite side. Let calculations be made by measuring before the second is cut off, so that there will be just so many cuts, no more and no less, allowing for the kerf of every cut. If the log is to be cut into three-inch scantling, for example, saw a three-inch plank from each side, until there is a piece six and a quarter inches thick left at the middle. The kerf of the saw will remove about one-fourth of an inch. When a timber log is sawed in this way, the cuts will be of a uniform thickness from end to end. Now turn the log down and saw the cuts the other way in the same manner, and the scantling will not only be straight, but of a uniform size from one end to the other, if the saw be started correctly.—*Sel.*



SIDE ELEVATION OF \$3,750 COUNTRY RESIDENCE

Running Locomotives.

"Lots of chaps think it would be fun to run an engine," said the driver, as he stuck his head, a flaming torch and a long-necked oil can in under his machine, "but if the most of 'em would try it they wouldn't like it quite so well. 'Taint everybody can run a locomotive either, though I s'pose it's like running a daily newspaper, which I've heard tell everybody can do. Now, a nervous man has no business in a cab; no more has a careless one or a stupid cuss. To run an engine a man must feel his responsibility, and keep his head level. I don't believe half the people know what it is to run an engine. Now, there's the machine; that is the first thing, and it has to be in good order, and stay so. A locomotive has to stand wear and tear and weather that'd knock a stationary engine into smithereens. And no

matter what emergency rises—freezing of pipes or starting of flues, a loosening of packing or heating of journals—we've got to know just what to do, and do it right quick, too. Then when we're running there's the time-cards, and pretty often a new one. And the train orders—they are life and death and reputation to us, and to read 'em correct and to live up to 'em gives us no end of anxiety. Bet I've read a train order over a dozen times an hour—I am always so afraid of making a mistake or forgetting. You know the consequence of even a little mistake sometimes.

"Then there's signals to watch, the conductor's go'ng overhead, steam to keep up, time to make, whistle-posts and crossings to look out for, bad spots in the road to be careful on, and along with all this, there's the track ahead of ye which your eyes mustn't leave for more'n five seconds. There's the brakes, too—one is al-

ways worrying about them. I don't s'pose everybody knows, either, that we have to be mighty careful when we come to the top of a grade. You see in going up she labors hard, and so as soon as she begins to descend she makes a rush, and there's the danger of breaking your train when the rear cars are still dragging on the up grade. This danger is especially great on freights, but no good engineer fails to shut off some of his steam when his engine reaches the summit. It isn't every fool that can run a locomotive."—*Sel.*

Science of Carpentry Made Easy.

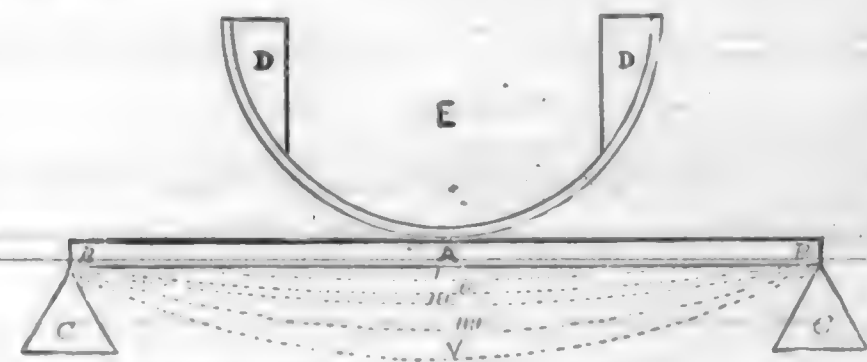
A WORK that should be in the possession of every mechanic, as its pages are full of practical, instructive matter pertaining to carpentry, bridge building, etc. Price, \$5.00.

Native California Woods.

[A series of articles written expressly for this Journal, in which special attention will be given to the principal characteristics of Redwood.]

THE editors of this paper have requested us to tell all that can be demonstrated regarding the woods found in the Golden State, especially as regards that which is indigenous to the Pacific Slope. In view of this they forward samples of the redwood, for physical as well as chemical investigation, both or either of which, to tell all that is demonstrable by the aid of these two sciences alone, would require a volume the size of this page and many, many leaves; but we will endeavor, commensurate with succinctness, to dwell in as brief manner as possible on the technical minutiae, making all, or the majority, of the tests for the purpose of giving accurate information regarding the timber from the standpoint of the architect and builder.

First, its elasticity. For this test the basis is made for a stick precisely one foot square, and thirty feet between the rests, as shown in Fig. 1.



a—timber; b b—points 30 feet apart; c c—rests; d d—appliance to balance without weight; E—weights or applied pressure susceptible of being weighed; I, II, III, and IV, are represented by the timber when subjected to pressure at E's space; ffff—arcs.

With this crude drawing, we will place 1,210,239 pounds pressure, and find the stick has reached the first line, or I, from which it readily springs back to its original position; but if another ounce or gram weight be added, its pliance is forever destroyed; hence this 1,210 pounds and a fraction represent its actual elasticity, something remarkable when we take into consideration the natural brittle texture of the wood. Now, by adding 400,7520 pounds more pressure, the timber bends down to the line marked III, and when again freed rebounds back to I, but would not if another atom of pressure was applied; hence its second tension strength is represented by a trifle over four hundred pounds.

We have now represented, by the two pressures, 1610,991 pounds, and the stick, permanently bent, to all intents and purposes, out of true to the extent represented by the arc in the cut. To bend down to III, requires 300,2711 pounds, when the timber goes back, after the weight or pressure is removed, to IIII; and it will be noticed with the slight addition of 300 pounds and a fraction, the timber made quite a depression, and we will call this the third tension, the best tension, really, of any timber, as will be shown from another series of tests farther on, inasmuch as the wider the space between these lower arcs and the timber, going back to the limit of previous tests, indicates less liability to break beneath first load, if left with inadequate supports.

We have now 1,911,2621 pounds pressure, the timber still whole, unfractured, as proven by its power of rebounding back to IIII and remaining. The fourth tension required an additional pressure of 501,3113 pounds to crowd down to III, when it rebounded promptly to IIII, showing a readiness to bear a greater load and come back to its original shape when the load was removed. We have now applied 2,412 pounds and over, and the timber's formative fabric uninjured, surified by attaining the lower limit of previous test, by the addition of 118,112582 pounds, the timber settled to II, rebounding to IIII and 16.5 pounds more brought it down to I, when it refused to go any better and respond or make any effort to reach its original position. Below this, so far as this test is concerned, the less said concerning it the better. Right here begin the tests to determine other strengths, which we will refer to again at another time.

It may be stated authoritatively, then, that the various tensions to which the wood has been subjected, are represented in the aggregate by 2,547,084882 pounds, before the formative fabric has been disturbed. But the timber is not used up yet by any means; for if the bearing weight of a timber falls short when placed horizontally, it may possibly be placed at certain angles, when it will outstrip all competitors for another test. But to return to our subject. It will be noticed that the point where we applied the weights, or pressure, to determine these tensions of itself, is an arc. It is necessary to have represented the entire length of the timber, so far as bent, with a pressure applied by touching the surface of the timber precisely as represented by each arc below, illustrating the various tensions, otherwise, even if it were possible to bring hydrostatic pressure—the means we employ in laboratory practice—the results would not be accurate, inasmuch as besides an insurmountable difficulty of applying to the center of the timber, it would not press alike along the line of the depression. We wish to explain these various steps as we pass along, for there will something grow out of these that every architect and builder in the entire country should fully understand.

It has been stated that the timber referred to rebounds after further pressure. We will now examine into its structure and try to ascertain why this is so. If we count the grains in the stick, we find it to contain 158, about; these are held in place by the constituent elements of the wood itself, there being no mechanical action, whatever, where one of these circles is separated in sawing, or any division. These do act slightly mechanically, as was stated in a previous article, by their straightening out. This, too, we may have reason to refer to again.

These chemical elements of which we speak, consist of cellulose, gum, starch, gluten, and the like, but we have not submitted the wood to chemical analysis yet, neither can we, until the other tests are farther along, for apparent

reasons, but will in due time. If any force is brought to bear having a tendency to displace the molecules constituting these elements, the end of the timber, which was previously perfectly square and smooth, will be notched and jagged precisely in proportion to the accuracy of the previous tests, and when these were completed in this case, careful counting revealed just as many of these steps on the end as could be counted grains in the timber, hence the test must be accurate, for the substance situated between each two of these grains, had been absolved or set free from the grains, hence each one of them contained just sufficient elasticity, and no more, to sustain its individual weight, and of course could not spring back.

IN Germany a very singular custom is in vogue, under which the architect himself sometimes undertakes to erect, for a lump sum, the building which he has designed. Although this is rather shocking to our notions, it can hardly be said that there is anything really objectionable in such a custom. On the contrary, under it the owner, if he has made the architect understand his wishes, can be absolutely certain of having them carried out for the price agreed upon, without extras, since the architect cannot plead that he did not understand the plans, or that something was omitted from the specifications, as an excuse for making an additional charge; and the architect himself, if he has been careless about his plans, will be taught a useful lesson by having to pay out of his own pocket the cost of making good the defects, while, if he has shown care and skill, he will be rewarded by securing the builder's profit, in addition to his own commission, without any diminution. Even in this country engineers often carry out their own designs in this way, and an architect who happens occasionally to be asked to follow their example, should not, we think, be too hasty in refusing, although no one would wish to see the custom become general. One of the considerations mentioned by Mr. Cate's German correspondent against the practice of contracting with a single mechanic, is worthy of note, as suggesting a strong argument in favor of confiding the entire responsibility of buildings of the more decorative class to the architect. In replying to the question whether single or divided contracts are most in favor in Germany, this correspondent, Herr Ende, of Berlin, says that the former are not unusual "for simple and ordinary structures," but are rare in the case of elaborate and ornamental ones, unless the contractor is himself the architect; for the reason that, according to the ideas prevailing in Germany, "an artistic building can never be completely finished from the first design and the first estimate, but the chief and best portion of the work must be designed and worked out during its construction." "There is, however," he goes on to say, "an end to this when a contractor undertakes the building. Alterations can then be made only under stringent and costly conditions, which give occasion for all kinds of disputes."—*The American Architect and Building News.*

THE CALIFORNIA ARCHITECT AND BUILDING

The New Odd Fellows' Hall,

[Market corner Seventh Street.]

THE business centres in all large cities are constantly changing. Especially is this fact verified in San Francisco. The building of the Occidental Hotel caused a revolution in the character of the surrounding buildings. The erection of the Harpending Block on Market Street was regarded by many as a very weak experiment, but the owner, by securing responsible firms and offering them special inducements to occupy the stores, helped to make that section of Market Street what it is to-day. The building of Dunham, Carrigan & Co's splendid hardware edifice has more particularly drawn the attention of our large importers to that section of the city, and it is but the question of a little time when the space now occupied by the foundries, etc., must give way to commercial business buildings.

Probably no one single building has caused such a change of surroundings in its neighborhood as that destined to be made by the new Odd Fellows' Hall on the corner of Market and Seventh Streets, and of which we present a fine four page engraving. We confidently predict that inside of five years this section will be within the retail business centre of the city. Property owners are earnestly considering the best means to obtain this end and are making advantageous offers to business men for the purpose of inducing them to locate in the quarter referred to, good buildings and low rents for a few years being the particular inducements.

The new I. O. O. F. Building is located at the southwest corner of Seventh and Market Streets. The lot occupies a space of 150 ft. on Market Street by 140 ft. on Seventh, with an ell section of 25x75 running through to Stevenson Street. It was the intention of those having charge of the improvements to buy, if possible, the lot at the northwest corner of Stevenson and Seventh Streets and have the new hall cover that entire section of the block; but the rapacious greed of the owner of the lot referred to prevented any such arrangement being made. The total area covered by the new building is 22,875 feet.

In the early part of April, contracts were awarded for all the different portions of the work, it being deemed best to let each distinctive part separately, instead of lumping them all together. The principal contractors are as follows: Brick work, J. G. Liebert; car-

penter work, Ed. Farrell; cast iron, R. Llewellyn; wrought iron, Phoenix Iron Works; roofing, Cronan & Dunbar; plumbing, Geo. Milne; plastering, A. C. Corbett; painting, E. M. Gallagher; granite, Geo. Griffith; cement, Davis & Cowell. The entire work is under the immediate supervision of Messrs. Wright & Sanders, architects.

The front will be an exemplification of the style of architecture known as the Modern Gothic. This style was selected by the architects, because it enabled them to express in architectural form the purpose of the structure. Although at first glance but four stories are seen, yet practically the building will be five stories in height, exclusive of the basement.

The first story will be eighteen feet high. Owing to the grade in Market and Seventh Streets, this figure will be changed so as to conform to the grade in the two streets; the height of the story on the lower easterly end of the building will be nineteen feet, and on southerly end in Market Street sixteen feet.

As shown on engraving, the first floor will be occupied by stores; an entrance way is also provided on each main street.

The second story is intended principally for offices. Those in the Market Street front are for renting purposes, the rest being used by the Grand Secretary, library, reading-room, etc. The library room will be situated in the extreme easterly end of the Seventh Street front, in size 40x80 feet.

The third and fourth floors will be devoted to the uses of the order. On the former will be four lodge rooms and one for the Rebecca Degree Lodge. Quite a novelty will be introduced in the shape of the Encampment Room, which will be situated in the upper floor. Its size will be 40x40 feet, and in the centre thirty feet in height and will be made in the shape of a tent.

The basement will contain the dining hall, kitchens, pantries, etc. The former to be 62x107 feet in size and will accommodate about 1,500 people. Extra provisions have been made for large, well ventilated hat and cloak rooms. No bar room has been provided for, as it is one of the most excellent maxims of the great order of Odd Fellows "to abhor vice in all its forms," and so this, one of the most objectionable features commonly found in all places where public entertainments are held, will, in the magnificent temple under consideration, be found wholly wanting.

One of the main attractions of the building will be its magnificent public hall, to occupy the rear of the building towards the Stevenson

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