

Beach and Jefferson. Owner, P. H. Hink; architect, C. F. Mau; contractor, — Crohn; cost, \$6,000.

Three barns and one two-story stable (frame) on old county road near Industrial School. Owner, George C. Smart; contractor, — Sprague; cost, \$10,000.

Three-story frame, brick basement, on Howard between Seventh and Eighth. Owner, Mrs. M. J. Brady; architect, W. Mosser; contractor, Quinn & Hennessey; cost, \$9,500.

Tank frame and tanks 914 Stockton between Clay and Washington. Owners, Kim, Wing & Co.; architect, T. J. Welch; contractor, George Fessler; cost, \$4,500.

Additions to dwelling corner California and Octavia. Owner, Mrs. Atherton; contractor, — Tilden; cost, \$3,000.

One-story and basement frame school-house on corner Buchanan and Waller. Owner, Protestant Orphan Asylum; architects, Cleveland and Swain; contractor, A. Flood.

Repairs to two-story frame on Fell near Buchanan. Owner, Bethel; contractor, J. T. O'Brien; cost, \$1,800.

Repairs to frame on north side Grove between Van Ness and Franklin. Owner, J. Maguire; contractor, J. Hamilton; cost, \$1,200.

Two-story framed dwelling on Cook street near Point Lobos avenue. Owner, — Cardie; contractor, W. B. Warren; cost, \$1,500.

One-story frame on west side Baker near Pine. Owner, J. S. Adams; contractor, S. M. Hills; cost, \$1,300.

One-story frame on south side Post near Lyon. Owner, M. Aylward; day's work; about \$800.

Repairs 2216 California. Owner, Braunschweiler; architects, Kenitzer & Raun; about \$800.

Repairs to building 2412 Sutter. Owner, Diggins Bros.; day's work; cost, \$800.

Repairs to building on Octavia between Fulton & McAlister. Owner, Thomas Cleary; day's work.

Two-story frame building on Third street near King. Owner, Burns & Kneese; day's work.

Repairs to building on Clara between Fourth and Fifth. Owner, J. Mahan.

One-story frame on Eighteenth and Stevenson. Owner, J. Carroll; contractor, J. Hadan; cost, \$1,100.

Two-story frame on Valencia street between Nineteenth and Twentieth. Owner, Hugh Curran; architect, W. P. Moore; contractor, J. Blake; cost, \$3,200.

Repairs to building on Alabama between Twenty-third and Twenty-fourth. Owner, R. F. Brown; day's work; \$800.

Repairs to building 292 Capp. Owner, Mr. Wente; contractor, W. F. Muller; \$600.

Alterations to brick warehouse on Berry street between Fourth and Fifth. Owner, Mr. Richardson; contractor, G. T. Watterson; cost, \$1,500.

Two-story frame on corner Third and Berry. Owner, Pope & Talbot; day's work; cost, about \$2,800.

Additions to building corner Folsom and Main. Owner, California Oil Works; day's work; cost, about \$3,500.

Frame building corner Second and Folsom. Owner, Pacific Foundry; about \$500.

Repairs to building 28 Perry; day's work. Owner, P. Heyfron; cost, \$750.

Repairs Fourth and Bryant. Owner, J. F. Swift; day's work; \$600.

Repairs to building on north side of Union between Buchanan and Webster. Owner, J. W. Gudwold; contractors, Gray & Glover; cost, \$1,400.

One-story frame building corner Chestnut and Steiner; day's work; cost, \$1,400.

Additions to four two-story frame on west side Leavenworth near Broadway. Owner, H. B. Meyer; day's work; cost, \$1,600.

Alterations 1619 Washington street. Owner, I. E. Smith; architect, W. P. Moore; contractors, Conrad & Miller; cost, \$2,000.

Three-story frame on Montgomery avenue between Filbert and Greenwich. Owner, Martino Plauduch; day's work; cost, about \$2,500.

Alterations to building on Rausch street between Howard and Folsom. Owner, Mrs. Hedinger; contractor, — Appel; cost, \$1,500.

One-story frame on Mission near Seventh. Owner, Dunn & Co.; contractor, W. H. Wolf; cost, \$600.

Repairs to two-story frame corner Bryant and Decatur. Owner and builder, Thomas Jones; cost, \$1,200.

One-story frame corner First and Frederick. Owner, H. Perry; \$600.

Two-story frame on Brannan street near Mail Dock. Owner, American Salt Co.; contractor, C. Kinsman; cost, \$3,000.

Repairs to M. E. Church on Mission street between Eighteenth and Nineteenth. Cost, about 2,500.

Two-story and basement frame on Buchanan and Webster. Owner, — Higgins; architect, Warren; contractor, R. McCann; cost, \$4,500.

Two-story brick building on Townsend between Second and Third. Owner, — Kittle & Co.; contractor, J. Hughes; cost, \$20,000.

Alterations to Cal. cigar box Co. building on Berry street near Fourth; day's work; cost, \$2,000.

Repairs to frame building on Fourth street near Townsend. Owner, D. Cardaire & Co.; contractor, — Lehouse; cost, \$1,750.

Improvements to coal depot, Beale Street Wharf. Owner, Oregon Improvement Co.; day's work; cost, \$3,000.

One-story frame and basement on Larkin street near Lombard. Owner, R. Webber; contractor, — Inwood; cost, \$1,250.

Filbert and Hyde, two-story frame and basement dwelling. Owner and builder, Wm. Binion; cost about \$3,000.

Repairs to two-story frame, 413 Golden Gate Avenue. Owner, J. M. Johnson; day's work; \$1,000.

Frame dwelling on Nebraska between Alabama and El Dorado streets. Owner, Mrs. Kelly; architects, McDougall & Son; \$1,000.

Alterations Shotwell street between Twenty-first and Twentieth. Owner, Mrs. Hardell; architect, H. Geilfuss; contractor, — Stecher; \$500.

Alterations to building California and Stockton. Owners, French Bank; architect, A. Pissis; contractor, R. McCann; \$2,000.

Two-story frame, with basement, on Shipley near Ninth. Owner, Mrs. Mary Feeny; contractor, — Beecher; cost, \$2,000.

SACRAMENTO.

Two-story and basement frame on corner of Tenth and H streets. Owner, L. Williams; architects, Babson & Seadler; contractors, Carle & Croly; cost, \$16,000.

One-story brick building on L Street. Owners, Huntington, Hopkins, & Co.; architect, N. D. Goodell; contractor, M. Madden; cost, —

Additions to building 508 J street. Owner, H. Fisher; contractors, Carle & Croly; cost, \$4,000.

Three-story brick building on the south side of the Square. Owner, J. F. Hill.

Robusting the Metropolitan Theater on K street. Architect, W. H. Hamilton; contractors, Carle & Croly; cost, \$12,975.

SAN JOSE.

Two-story brick building on south side Santa Clara street, between San Pedro and Orchard. Owner, J. Lavidan; architect, Theo. Lenzen; contractors, Kenney & Leddy; cost, \$6,325.

Frame building with brick basement on south side of the Alameda, between Los Gatos Creek and the Fair Grounds. Owner, N. Cadwallader; contractor brick work, — Otto; architect, Theo. Lenzen; carpenter work by the day; cost, about \$12,000.

Seven miles from San Jose, between the Monterey Road and Gayote Creek, two-story frame dwelling. Owner, H. Schelckard; architect, Theo. Lenzen; contractor, Jacob Lenzen; cost, \$3,170.

ALAMEDA.

Two-story frame dwelling corner Grand street and Central avenue. Owner, H. Michaels; architects, Babson & Seadler; builders, Gilbert & Brown; cost, \$7,000.

Two-story attic and basement frame dwelling on Alameda avenue, between Chesnut and Willow. Owner, Eugene Bissell; contractor, J. H. DeNise; cost, \$4,000.

One-story and basement frame, corner Alameda avenue and Willow street. Owner, H. R. Jacobson; contractor, Shainer & Mosher; cost, \$2,600.

One-story and basement frame cottage on Central avenue near Willow street; contractor, Millington; cost, about \$2,500.

Repairs to two-story frame on Webster near Pacific avenue. Owner, D. Scully; contractor, C. Christensen; cost, about \$400.

Repairs to two-story frame on Park street near Railroad avenue. Owner, J. M. Kay & Son; contractor, S. Hatfield; cost, \$500.

One-story and basement cottage corner Pearl and Santa Clara avenue. Owner, DePenna; architect, — Chandler; contractor, S. Hatfield; cost, \$2,000.

OAKLAND.

Two-story frame, brick foundation, on Vernon street (Oak View Homestead). Owner, Thos. Fwing; architect, O. F. Mau; contractor, — Smiley; cost, \$4,000.

Two-story frame building corner High street and East Twelfth. Owner, Miller & Windsor; contractor, F. A. Brown; cost, \$1,000.

Two-story and attic frame dwelling at Highland Park. Owner, Mr. Leask; contractor, F. A. Brown; cost, \$4,000.

Conservatory at Tomesdale. Owner, Captain Ainsworth; architects, Matthews & Son; day's work; cost, \$10,000.

Two-story frame dwelling at Fruit Vale. Owner, J. M. Dawley; architects, Matthews & Son; day's work; cost, about \$9,000.

Two-story attic and basement frame dwelling on Thirteenth and Castro. Owner, I. E. Barber; architect, Clinton Day; contractor, — Childs; cost, about \$12,000.

One-story and basement frame on Willow street between Fifth and Atlantic. Owner, Thos. Hart; contractor, Thos. Dignon; cost, \$750.

One-story frame on Ninth avenue near East Sixteenth street. Owner, Mr. Davis.

Four one-story and basement frame cottages on corner of Wood and Taylor. Owner, J. T. Jeffery; contractors, Knowles & Welby; cost, \$5,500.

One-story and basement frame cottage corner Willow and Taylor. Owner and builder, R. H. Jones; cost, \$1,200.

Two-story frame cottage corner Seventh and Chester. Owner, John May; contractor, W. P. Kelley; cost, \$1,600.

Two-story frame, brick foundation, at Highland Park. Owner, T. E. Polk; architects, Taylor & Copeland; day's work; cost, about \$6,000.

Alterations to two-story frame near Mills' Seminary. Owner, J. A. Benson; architects, Taylor & Copeland; contractor, — Lawrence; cost, \$1,000.

MT. EDEN.

Two-story frame dwelling. Owner, L. Schafer; contractor, C. F. Mau; cost, \$8,000.

Two-story frame dwelling. Owner, H. Peterman; architect, Schmidt & Havens; contractor, — Haskell; cost, \$3,000.

ST. HELENA.

Additions to the school-house on Oak avenue. Cost, \$2,300.

SEATTLE.

The Catholics are erecting a church. Contractors, Park & Griffith; cost, complete with pews, etc., \$5,200.

SAN BERNARDINO.

A theater is in process of erection by Messrs. J. Waters & H. Brinkmeyer; cost, about \$15,000.

LIVERMORE.

Two-story brick building. Owner, — Hawley; day's work; cost, \$10,000.

One-story and basement frame. Owner, Wm. Callahan; cost, \$1,500.

One-story frame dwelling. Owner, — Harris; contractor, — Hatch; cost, \$1,000.

PORTLAND.

Contracts were let for two new public school-houses. Davidson & Sharno, contractors; cost, \$27,598 and \$27,698 respectively.

STOCKTON.

Five-story brick building for flour-mill. Owner, Sperry & Co.; architects, Percy & Hamilton; contractors, Ed. P. Allis & Co.; manager, J. R. Cross; cost about \$125,000.

SAN RAFAEL.

Two-story and attic frame dwelling. Owner, Thos. Menzies; architects, Wright & Sanders; cost about \$20,000.

TULARE.

Building for stores and lodge rooms. Owner, Oleoso & Garibaldi; architect, H. D. Mitchell; cost, \$7,000.

OAKLAND.

Frame cottage on Clay street between Fourteenth and Fifteenth. Owner, — Hyde; contractor, — Englishman; cost, \$2,500.

Old Ladies' Home. Architects, McDougall & Son; contractor, — Herbst; cost, \$23,000.

BERKELEY.

One-story frame cottage on San Pablo Avenue. Owner, J. Jensen; architect, H. Geilfuss; contractor, — Herbst; \$1,400.

WOODLAND.

Frame building on Third street. Owner, S. Barnes; contractor, Mr. Blake; \$1,175.

One-story building on Railway street. Owner, C. E. Dingle; contractor, W. H. Carson; \$1,500.

Two-story barn on Railway street. Owner, W. Shellhammer; day's work.

Small dwelling near town. Owner, Mrs. Roberts; \$700.

Repairs and additions to the Hesperian Cottage. Contractor, W. H. Carson; \$2,300.

Alterations to building on Front street. Owner, S. Hyman; day's work.

Alterations to two houses owned by — Sprague. Contractor, Amesberry & Co.; \$800.

FRESNO.

One-story brick building for distillery and wine cellar. Owners, George H. and H. O. Eggers; architect, H. Geilfuss; day's work; cost, about \$12,000.

One-story brick building on Mariposa street. Owner, W. Robertson. Contractor, W. Betteridge; cost, \$1,800.

One-story and basement brick building. Owner, S. A. Miller; contractor, W. Betteridge; cost, \$3,500.

One-story frame building. Owner, Dr. S. J. Lusk and Dr. Froelich; contractor, — Clifford; \$1,500.

MIGGS.

Two large bridges are being built over the Cherokee Canal; day's work; J. W. Myers, Supt.

Frame barn. Owner, W. F. Boulwan; contractor, J. W. Myers.

One-story frame building. Owners, T. & J. Webb.

Frame building for wagon shop. Owner, John Sha.

REDDING.

One-story brick building, 75x140, corner California and Butte streets. Owner, Hon. C. O. Bush; contractor, A. J. Bryan.

CENTREVILLE.

Two-story frame and basement frame dwelling. Owner, S. H. Hall; architects, S. & J. C. Newsom; contractors, Knight & Littlefield; cost, \$4,100.

Book Notices.

Interiors and Interior Details.—A new work containing 82 large quarto plates, comprising a large number of original designs of halls, stair cases, parlors, library rooms, dining rooms, wood mantels, sideboards, furniture, wood ceilings, etc., making a valuable series of suggestions for architects and architectural designers. Also a large collection of interior details, suited to the requirements of carpenters, builders, and mechanics. By William B. Tuthill, A. M. We will send the above work to any address upon receipt of the price, \$7.50.

Modern House-Painting.—The want of a work of this character has long been felt. A very meritorious effort has been made to supply this want by Messrs. E. K. Bossett and F. A. Wright, architects of New York. They have prepared a work containing numerous colored lithographic plates, exhibiting the use of color in exterior and interior house-painting, and embracing examples of simple and elaborate work, in plain, graded, and party-colors. The great merit of this work is in the colored plates, by which any one can see at a glance how a house would appear if painted according to the authors' directions. Sent to any address upon receipt of \$5.00.

Village and Country Homes.—Nearly one hundred designs 9x12 inches. Price \$5.00.

Standard Sign-Writer and Letterer's Companion.—A new volume just received. Price \$2.00.

Kent's City Review of Science.—No. 1 of Vol. VI has come to hand of this, one of the most valued of our numerous exchanges. The editor has excelled himself in the first number of the new volume, and has given his readers a series of articles, each one of which is worth more than the price of the book per year. \$2.50 is the low rate for which the Review is sent to any address.

All books noticed in these columns can be had at publishers' prices at this office. Sent post-paid to any address.

Practical Lessons in Architectural Drawings...... \$ 2.50

Carpentry made Easy...... 5.00

Mechanics' Geometry...... 5.00

Gould's Carpentry...... 1.00

Model Homes...... 2.00

Taney's Alphabets...... 3.00

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" Specifications."..... .50

The average number of

The California Architect and Building News.

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Owners Want too Much for Their Money.

This is an oft-repeated saying among contractors, and great stress is laid upon the injustice of the course claimed to be pursued by many owners. But for argument's sake, admit that parties contemplating the erection of buildings do propose and offer to pay but seventy-five, eighty, or ninety cents for every dollar's worth of material and labor received. Are contractors bound to accept the proposition? It always requires two or more to complete a bargain, and no proposition made by one party is binding upon another until the second voluntarily accepts that which is proposed by the first. Consequently, those who accept such unfair proposals, and deliberately enter into oppressive obligations, simply because somebody wants them to do so, certainly do not demonstrate the possession of any large amount of sound business sense. No one in this free land of ours is obliged to submit to unjust exactions in business transactions, particularly when business is active, and those who propose to do intend and will carry out their purposes, whether the cost be more or less than their limits. One thing is certain, thousands of building contracts have been let in San Francisco for less sums than owners were willing to pay; and a large amount of money, greater than has been, might have been handled by contractors, had a wise and correct system of figuring prevailed among them. But admit again for argument's sake, that owners do seek to secure the improvement of their property for less than actual cost, does it become the duty, and is it a virtue on the part of contractors, to bow the business knee and bare the manly brow to such propositions? Certainly not. And yet it matters not how mean a proposition may be, there are hosts of hungry men—hungry for the pleasure of signing one or many contracts, and controlling a few thousand dollars, with more of doubt and uncertainty than assured profits at the end of the operations. The fact is, that building contractors, as a rule, have been more earnest and determined in purposes to obtain work, and beat the next man, than in devising and maturing correct and safe methods of figuring. The average number of

contractors who estimate by the safe rule of *certainties*, minus all speculative suppositions, is small compared with the many who figure to win, risking the chances upon the various devices so generally resorted to by *low figures* to save, omit, and economize, and ride over plans and specifications to the full extent of possibilities.

If owners do ask for more than is right, the generality of contractors have assisted in creating that disposition by reckless *under-bidding*; and the manifestation of a willingness to serve any man who asks their service, with scarce ever a firm, manly, and determinative *refusal* to yield when propositions are advanced, seeking abatement of the sum proposed as a right and proper cost, and other methods of obtaining much for little pay.

The facts are, that the contracting business has been and is overcrowded; the mediocre, wholly incompetent, and shamefully deficient outnumbering the more competent, reliable, and safe men. Hence innumerable wrongs in various shapes and forms have developed and attached to the building contracting business, and the drift of things generally has been to pile up stumbling blocks in the way of good men and *general success*; rendering it difficult for any not enjoying *special advantages*, to pursue the business with profit. And as one of the natural results of this irregular condition of things, impressions prevail among a considerable number of property owners, that by a little effort on their part in manipulating arrangements, understandings, and preliminary movements, they can save from five to twenty per cent. in outlays for building purposes, which they often do, because of the yielding by contractors to almost any proposition which presents the slightest prospects for work, thereby virtually sanctioning operations adverse to the best interest of the mechanical classes.

Architects vs. Economy.

The full report in our Building Intelligence has been the subject of much remark among those most interested, partly on account of the great percentage of buildings that have been erected without the services of the architect being called into requisition. We have reported buildings the cost of which have been over \$10,000, and the owners thereof have had the buildings erected, the carpenter drawing the plans and carrying them out, no architect being in supervision of the job.

Owners sometimes deceive themselves, and imagine that they can get along as well without, and save the expense of an architect in the erection of the buildings. Some may have done so to their satisfaction, but the more general experience is, that it is a very unwise course for an owner to pursue. By it, many a building has been spoiled in its arrangement and construction, and the loss in diminished rents, vacant premises, and the continually occurring repairs, amount to as much each six months, on an average, as would have paid a competent architect full fee for his services.

Owners are often brought to grief by their mistakes in the means employed by them to avoid an architect's fees, and obtain the plans and details necessary for their buildings. In order to obtain the latter, and get rid of the "fee," some "friend carpenter" is intrusted with the whole matter of plans, specifications, and construction. In such cases, *repentance comes too late to the victimized owner*. The party to whom

the work is intrusted makes the plans, and the work is commenced with a "smile" all around. The frame is inclosed, and the partitions set. A practical plumber is called in, who puts in the gas and water pipes under the *car*;—the superintendence, and for a while things go on swimmingly. The walls are plastered, and then the first trouble begins. The good wife who is to inhabit the mansion now gets her first practical idea of how the house will look on the inside when finished. Rooms are found to be out of proportion; closets wanting; gas and water pipes in wrong place; not head room enough for the stairs, etc. Changes are begun, and until the building is finished, the general order of the day is to "fix" up things to correspond with the owner's "improved" ideas.

The house is finished, and it would amuse a "professional" if some of the balance sheets of a first year's residence in some of the "no-architect's houses" could be shown to outsiders. We had the pleasure of seeing one of these documents, and here are a few of the items.

Taking up and replacing floors to fix water pipes..... \$11
Changing sink, and adding a trap, none having been provided..... 9
Raising of one corner of the house, it having settled so much that it had to either go up or owner go out..... 32
Repairing leaks in roof..... 7
Whitening walls stained by leaking of roof..... 5

But we will not continue our enumeration of the evils which are incident to every house whose plans have not been thoroughly studied and specified before the commencement thereof.

Such cases as the above are well known to more than one of the architects of this city, and many a "served him right" is indulged in, upon the principle that a competent physician laughs at the sufferings of a patient whose pains and agonies result from self-treatment or quack practice, or the educated lawyer smiles when his client gets himself into a *terrible fix* by intrusting his case to some pettifogger, or who tries to work out the intricacies and problems of law by his own self-conceited legal ingenuity.

San Francisco Chapter American Institute of Architects.

The regular meeting of this chapter was held on the 7th ult. A large attendance was present, and the good feeling and interest taken in all the subjects brought before the chapter

Draughtsmen and Builders.

We would call particular attention to the ad., on page 106, of **DRAWING INSTRUMENTS, AND HOW TO USE THEM.** Also to the publication, "Carpentry Made Easy," page 12. "American Cottage Homes" is a new work just issued, and well deserves the favorable mention it has received in the Eastern journals. It contains plans, elevations, perspective views, sections, details, also specifications, form of contract, and descriptive letter-press on back of each plate. It is illustrated by 40 9x12 plates, with over 260 drawings. It will be sent to any address upon receipt of publishers' price.

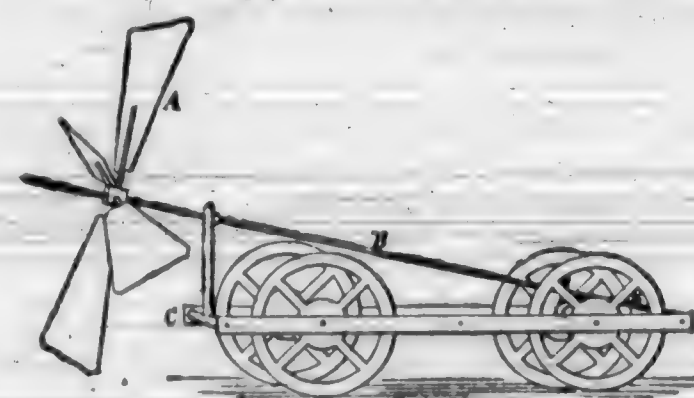
Necessity and Invention.

Given the best material, ample facilities, and a high order of inventive skill to devise something new, such material, facilities, and skill had much better be turned to other account if there be not a demand for the article in question. Invention is the offspring of necessity in the fullest sense, and unless the something produced fills a niche in the wall of wants, the inventor had better have devoted his brains, time, and material to other employment. It is the disregard of this phase of the great natural law of "demand and supply" that cumber the patent-office with specifications of so many inventions that come to naught. The number of improved bootjacks, rat-traps, and miscellaneous articles which have been patented is legion. Men mistake invention for a business, and enter into it as they would in selling dry goods or making shoes; possessing a knack for invention they bring forth an array of articles intended for almost every use in the calendar. Some of these are very cunningly contrived, no doubt, but the reason why they fail to bring remuneration to the inventor for the time, labor, and money expended in perfecting them is that the world's economy does not require them. There has been a waste of forces. The vital trouble lies in the fact that these inventors look at the matter from the wrong end. They set about to make "something," trusting that its radically new character will find a place for it, instead of trying in the first place to discover what thing the exigencies of this or that trade demand. Sometimes one of this class will succeed in hitting upon a valuable invention. We will say that his work is some piece of mechanism connected with cotton manufacture. He immediately begins to adapt the principles of his invention, or a modification of them, to iron-working or some other branch of industry, and oftentimes loses what he gained in his mania for inventive experiment. The "professional" inventor rarely succeeds in the long run.

And yet the field for invention is by no means closed. There is every encouragement to-day for inventive genius. Great and revolutionary as have been our improvements in machinery, industry awaits and will pay for others. There is need of more perfect appliances for treating cotton between the field and the factory; a machine is wanted to manipulate jute and like fibers, to the end that we may make such staple products and compete with the poorly paid labor of countries across the water. A fortune awaits the successful inventor in these and many other fields, but in every one the necessity must first exist. In many instances the pressure of circumstances almost compels the invention of the thing desired. We see this nowhere better illustrated than in the annals of prison life. Some of the most curiously contrived tools known to mechanical experts have been fabricated by prisoners in their endeavors to escape. Here an imprisoned convict, lacking tools or material, contrives to make a key by scraping lead from a water pipe, melting it in a spoon over a fire made from splinters of his furniture, and casting it into form, and with it opens intricate locks. Others per-

form almost superhuman feats in the way of producing inventions for cutting iron bars, drilling through iron doors, breaking through heavy stone walls, and constructing ladders, weapons, files, saws, hammers, and other tools. The same conditions exist where legitimate invention is concerned. It does not depend so much on the facilities that the inventor has at his command as on the necessity for the thing which he seeks to produce. *Carpentry and Building.*

An Apparent Paradox.



Some months ago a question was proposed to me by an engineer of the United States Navy, and it was this: "Can a windmill be made to propel a vehicle directly against the wind, the wind blowing parallel to the axis of the windmill, and at right angles to the axes of the vehicle?" I replied that I believed it could.

After a warm discussion, in which several other engineers present took part, the discussion closed without any decision of the question. I might say that but one of the disputants agreed with me in my views of the question. As I believe in a practical demonstration of all theories, a few weeks afterward I made a model, like the one shown in the accompanying engraving. It consisted of four brass clock wheels 2" in diameter, and two strips of brass, C D, held together by three round bars, also used in making clocks. The spindle of the windmill, B, was made of a large-sized steel knitting-needle. The windmill, A, was 4" in diameter, the blades being made of sheet copper soldered to wire spokes at an angle of 45° with the axis B. A pinion, E, 3/8" in diameter outside, and having 8 teeth, was fastened to one of the axles, and a worm 1/4" in diameter, with a pitch of ten threads to the inch, was placed upon the spindle B.

This little piece of mechanism was placed before a Root blower and nicely adjusted. When the blower was set in motion by hand, the model began to move towards the open end of the air pipe, and the harder the blast, the faster the model ran, contrary to the predictions of those who beheld it. Some even said it would move backward.

This may be interesting to the readers of the *American Machinist*, and perhaps some of them will be kind enough to explain how and why it moves, as it is settled beyond a doubt that it does move, and with considerable rapidity, against the wind. —*American Machinist.*

Jumping at Conclusions.

The world is full of error and injustice, by reason of the prevailing disposition among mankind to prejudice the acts and sayings of their fellow-men, and to concoct and assert intentions and purposes for others never dreamed of by the parties upon whom the responsibilities are sought to be cast. This disposition to prejudice is almost universal, and is, as a rule, false and unfair to a greater or lesser extent: not unfrequently absolutely so, and in millions of cases practiced from evil motives, and for purposes of the basest character. The man who by word or act places himself in a position where criticism or attack is possible is certain to be "picked to pieces," it matters not how pure and worthy the actuating motives in him may have been or is, or how free from wrong intent; if the possibility of

impeachment, by forced constructions, misapplied reasonings, or theorizings made to fit, to the exclusion of real truth and fact, the sacrifice is demanded with a cool indifference as to personal rights of explanation or interpretation.

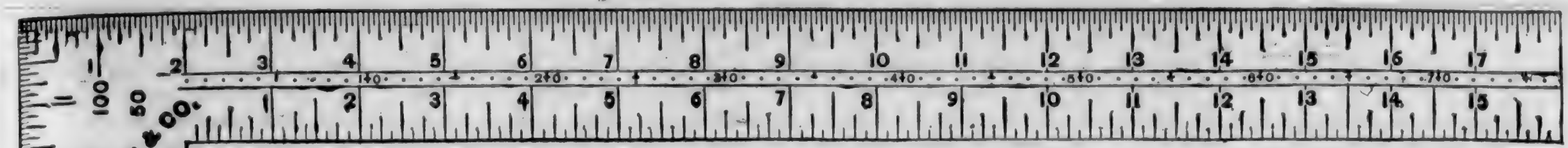
There are but few men—none of any material consequence or influence in the affairs of life—who have escaped this terrible tendency of the age to misrepresentations. And this evil has thrived and grown and become popular, because the masses derive pleasure from the unreal, fanciful, and visionary. The plain, matter-of-fact rule seems tame and unsatisfying in comparison with the exaggerated, overwrought, and high-strung statements and stories provided by that liberal-minded class of beings who so freely give away without charge their own interpretations of other people's acts and sayings, caring nothing for the correct truths and motives involved. These tongue and pen pictures, overwrought and highly colored though they be, seem to meet the liking of the present generation; and because they are received with general favor, the cursed evil is found to flourish in all grades and ranks of society, from the imperial throne down to the scavenger's hut. In this respect the old Bible Saw is most emphatically true, that "all men are liars." People do not like to bear—and will not gently—the opprobrious charge of lying; yet absolutely, the man or woman does not live, and never has, who at times and under circumstances has not misjudged the motives and mistaken the acts of others, in some form or shape. Thus it has been with the best and purest, and a thousand times more so with the great mass of humanity, with whom pure truthfulness and just judgment, at the sacrifice of that which will gratify personal feelings, and give scope and force to interested or malicious representations and motives, are as but the foam upon the ocean's surface, or the feather before the resistless storm.

Draughtsman's Paper.

A lecture was recently delivered before a Berlin drawing society on paper for the use of draughtsmen. Drawing-paper, now-a-days, certainly admits of division. The common sort, for rough drawings, is made from hemp, with a small portion of wood pulp added. This paper, although fairly adapted for the pencil, does not take corrections readily. It is altogether unfitted for water-color sketches. The paper prepared by the lecturer, Herr Wendler, and known as Wendler paper, is manufactured in two shades, a white and a yellowish. The latter is preferred by architects. The double animal-skin drawing-paper is somewhat equivalent to Whatman's paper, and takes India-ink very well. Whatman's paper is triple-sized, and drawn on linen. As tracing-paper, silk-paper may be considered the cheapest, and some of the best draughtsmen, etc., use no other. The French tracing-paper is cheap, but soon turns yellow. The German is far less brittle. The Whatman papers are very good, but very dear. That known as Ingres paper, after the great painter, is specially adapted for chalk drawings. It is prepared in some twenty shades. The Belgian-toned paper has a more regular grain than the French. The Canson Mongolfier paper is a rival to the Ingres, and has a large sale. The different kinds manufactured by Whatman would fill a page to mention. Bristol and Piries papers are also well known. —*Mechanical News.*

S. F. Chapter A. I. A.

At the next regular monthly meeting, the first Friday in August, nominations will be made for officers of the ensuing term, according to the provisions of the Constitution and By-Laws lately adopted.



We have received several letters in regard to the rules given for finding the necessary bevels to be made in order to produce a polygon with a given number of sides. One of the most important we place before our readers.

EDITOR CALIFORNIA ARCHITECT: In Rule 3 you state, to find the angle to form a six-sided prism, take 7 inches on the blade and 4 inches on the tongue; then the tongue and hypotenuse give the angle required. This is not correct, as you will see by referring to the following figure, where B C equals the given side, and B A, the hypotenuse, equals two of the given sides. For example, $4 \times 4 = 16$, and $8 \times 8 = 64 - 16 = 48$; the square root of 48 = 6.92 +, which represents the length on the blade. The formula should be 4 on the tongue and 6.92+ on the blade, using the bevel formed by the tongue of the square. Respectfully, L. D. G.

We admit the correctness of our correspondent's views, and would simply state that in giving the rules we have, it has been our aim to give the figures as near as they could be practically used by the mechanic. As in this case, when the figures are within a few one-hundredths of an inch, we have given the numbers on the square that could be readily used by the workman. A shaving or two with a block plane from each bevel will enable the mechanic to fit his work together with a precision and nicety that should be the chief aim of every mechanic.

Haswell and many other first-class writers have the words "which will do for all practical purposes" after many of their measurements; and the figures used in all our illustrations are as near correct as can be for a mechanic's use.

E. M. H. writes: "I have been working on buildings where the head carpenter, with a ten-foot pole, a pencil, and a square, will lay out the pattern for the rafters in less time than it takes me to write this. Upon asking for information how to do the same thing, I was told to 'study up the matter as he had done.' Please give me a more PRACTICAL answer."

Although not a very polite answer to receive from a fellow-workman, it is directly to the point. If E. M. H. will invest a few dollars in PRACTICAL WORKS on the Steel Square and its Uses, etc., he will, with a little study, lay out rafters as easily as the "head carpenter." Of course, in laying out a rafter the first thing to find out is the pitch, or rise

of the roof. A quarter-pitch is one where the peak of the roof is one quarter the width of the building higher than the plate. One-third pitch, peak one-third higher, etc. Or, in other words, a one-quarter pitch has a six-inch rise in each foot of width; a third pitch has an eight-inch rise in each foot, etc.

Pick out a straight piece of timber for a pattern. For a quarter-pitch place the square against the straight edge, with the tongue on 6 and the blade on 12. The bevel of the blade will be the bevel of the heel of the rafter, or the part resting on the plate. The bevel of the tongue will be the bevel of the point of the rafter.

Proceed in the same way with any given rise to the foot. For 5-inch rise to the foot, use 5 and 12 on the square; for 7-inch rise to the foot, use 7 and 12; and so on. The length of the rafter may be obtained in several different ways. Suppose the building is 36 feet in width, roof one-quarter pitch. On the square lay your rule so that the point will be at 18 on the blade, or one-half the width of the building, allowing one inch to the foot, and let the rule cross the tongue at the figure 9, which represents the rise of the roof, or one-quarter pitch. We find by looking at the rule the distance is 20 1/2 inches, or 1 inch to the foot—20 feet, one and a half inches. For a third pitch, let the rule cross at 12 instead of 9, and we have the length 21 feet, 7 1/2 inches.

Use a smaller scale for buildings that have a greater width than 48 feet. For those who understand the extracting of the square root, that plan enables them in a very short time to get the precise length of the rafter.

In the way just described, no allowance has been made for projections of rafters over the plate. It is obvious that a little different application of the principle will have to be applied if the rafter has a projection of one, two, or three feet.



In such case, determine the width of the projection at B. Of course this width varies so as to allow of different kinds of finish to be put on according to the taste of the architect or builder. Generally in this part of the country it is two inches. Run a gauge mark two inches from the face-edge of your pattern its full length, and get the length of rafter from D to A, same as before. Allowance will have to be made for a ridge-board, in case one is used.

Another method to get the length: Suppose the rafter has a projection of say 2 feet. Run a gauge line on your pattern 2 feet, the width you intend to

have the projection. Place the square on 12 and 6, and mark the heel of rafter, up to gauge mark. Get the plumb cut by placing square at right angles to the bevel of the heel. Continue this plumb cut to the upper edge, or back of the rafter. Set 12 on the square against the end of this line, and at 6, even with the back; then with the square in this position space off as many lengths as there are feet in half the width of the building, marking the top cut at the last space, using the bevel obtained at 6. Should a fraction of a foot occur in half the width of the building, lay out the last space in full for even feet; then slide the square back on the long bevel until the inches on the square at this bevel shall correspond with those of the width.

If the building should be very wide, say 112 feet, and the length of rafter is desired, first find, in the way first suggested, the length of a rafter for a building 14 feet wide, and then multiply the length by 8.

It is evident that this same method may be applied to finding the length and bevel of any brace, no matter what the run may be.

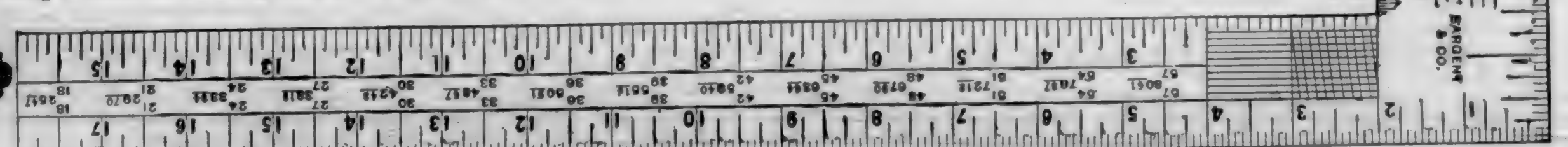
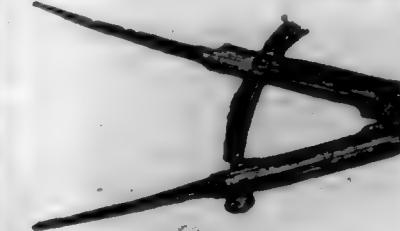
We have also received several letters from mechanics asking information in regard to several problems of which they have not as yet seen a printed solution. Many are quite old; we have selected a few, trusting some of our mechanics will be benefited thereby.



L. D. G., of Sacramento: "Please inform me how to make a circle, using the square alone."

Drive in a nail at the points A and B. It is better to use a "French" nail, as, being round, the square slips easily. The nails evidently cannot be farther apart than the length of the "tongue." Place the square in the position indicated in the cut; and with a pencil held firmly in the crotch at C, and the square kept on the nails, a circle can easily be drawn.

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This series of articles on the square was commenced in the September number, 1881. Back numbers can be supplied at 20 cents each.

Dwelling-House Sanitation.

BY GLENN BROWN.

[The following, from the pen of Glenn Brown, Esq., a brother architect of Washington, D. C., is a portion of a lengthy, ably written article upon the subjects discussed, and should be read by all classes of people; for all, rich and poor, are alike liable to the evils and dangers so fully presented by the writer.]

"Pure air, pure water, and a pure soil."—HIPPOCRATES.

The question of proper sanitary arrangements in our homes is a matter of such vital importance that an attempt to instruct the public in the most approved arrangements for sanitation needs no apology.

The subject is specially significant to the head of the family, as a citizen having the good of the community at heart, and as a parent having the welfare of those immediately under his charge involved in his care and guardianship; and although it is with the sanitary arrangements of the home as such that we have to deal in this article, the home is but part of society at large, and our remarks apply to questions which affect all, and in which all are interested.

It is impossible for any one to breathe vitiated air or gas, or drink impure water, or eat tainted food, and yet live and grow in health. Such conditions are seriously detrimental to the constitution—very often fatal. Many deaths do occur, as well as much trouble, expense, and pain, which might all be avoided, provided the heads of households would take the trouble to inform themselves on these weighty matters of every-day life. There is nothing which can compensate us for the loss of health, certainly neither wealth, nor the comforts and luxuries which accompany wealth. We all acknowledge this, and yet how strange to see the indifference and carelessness which the majority of mankind are constantly manifesting about this very point; when the proper precautions to be observed for the preservation of health are within the reach and adoption of all who will but think and act.

We shall, in this article, describe the different sanitary arrangements necessary in a home, according to the present status of sanitary science, to guide those desiring information, so they can judge whether the best practice is being carried out in their own case.

The sanitary arrangements of a house consist of its situation, exposure to light and air, heating, ventilation, and drainage, in their proper selection, planning, and workmanship.

The situation of the house is first to be determined. By carelessness in this particular, one may get into a malarious district, where fever and ague would be unavoidable, or one may have his house located on a soil where the water never drains off, and where the gases caused by decayed matter are constantly rising into the house and causing disease. The proper position of the house in regard to sunlight and the prevailing winds is a matter of importance; for in the sunlight we find health and comfort, while cold and wet winds are always hurtful in their effects, and to be avoided. In the heating apparatus (by which hot air is supplied), care must be taken that the air which is to be warmed shall be pure. It must be neither too hot nor too dry for breathing, as the lungs are thereby affected. The air is liable to be contaminated by coming from a foul source, over a sewer drain, or from a badly ventilated cellar, and after its entrance into the house by absorbing gases from the overheated surface, cracks, or joints of the heating apparatus.

The art of ventilating properly requires that the impure air which comes from our lungs, the foul exhalations which come from our bodies, and are absorbed by the air, as also the vitiated

air which is caused by combustion, or comes from other sources, may all be carried off, and an abundant amount of fresh, pure air may be supplied in its place.

The proper arrangement of the plumbing has the most important part to play as respects the health of a family. In what manner sewer gas affects the health is a much-disputed question; that it does, and causes typhoid fever, dysentery, diphtheria, and other similar diseases, is an established fact. Dr. De Verona, in his work on sewer gas, says: "If the physiological effects which follow the breathing of sewer gases are actually produced by what then enters the organism, it must be something besides oxygen, hydrogen, nitrogen, carbon, and sulphur, in their various combinations. There exists in living sewage multitudes of living germs. These germs are capable of growth and self multiplication. . . . They are infinitely small, light, capable of being lifted by the slightest current of air; in fact, their habitat is watery vapor. In pure, dry air they immediately perish; in impure air, charged with moisture, they live for a time yet undetermined; in humid air, charged with putrid animal matter, they live, nourish themselves, and acquire the full vigor of their nature. If, now, they are deposited in a proper indus, they reproduce themselves by myriads." We must leave it to the physician or the scientist to find whether or not the specific germ disease theory of Pettenkofer, or the putrefactive ferment theory of Sanderson or Beale, deserves the more credit. It is the duty of all who have the sanitary arrangement of their homes to superintend to endeavor to keep foul air and gases out of their houses and away from their water and food.

Whether it comes from the refrigerator through the waste, and is absorbed by our milk, meat, or other food, and thus taken into the system; whether it enters our wells, pumps, or cisterns, through natural conduits from cesspools or sewers, or our tanks through their waste; or whether it comes through the water-closet, wash basin, or from a foul cellar, and is drawn into the system with the breath—it is equally deleterious to those who dwell in the house, and affects, as matter of course, the men who have their business down town and in the open air less than those who stay constantly in the house and breathe these deleterious gases and germs all day. This sewer gas is truly very subtle, and will find its way through the smallest crevice; floors, brick and stone walls, offer but a slight impediment to its passage, and it contaminates the water, air, or food with which it comes in contact. To show how dangerous this contamination may be, we will quote an extract from the report made by the Massachusetts Board of Health in 1871 on the causes of typhoid fever. It concludes that its propagation is caused by a poison as definite as that which causes vaccine, and divides the means of propagations under three heads: "First, drinking water made foul by the decomposition of any organic matter, either animal or vegetable, and specially by the presence of excrementitious matter discharged from the bodies of those suffering from typhoid fever; second, propagation by air contaminated by any form of filth, and specially by privies, cesspools, pig styes, manure heaps, rotten vegetables in cellars, and leaky and obstructed drains; third, by emanations from the earth, occurring specially during the autumnal months and in seasons of drought." Dr. Bowditch of Boston, by private investigation in this country and Europe, concludes that consumption is increased by residence on damp soil, and it has been proved that thorough drainage of localities decreases the annual rate of consumption.

The financial aspect of the loss of health cannot be computed by the actual time lost during sickness. The time consumed by other members of the family while waiting on the sick one, doctors' bills, medicines, and luxuries, tend to make

sickness very costly; impoverishing those who are in moderate circumstances.

It is impossible to compute how much a man loses by half doing his work when he is not well. The *Plumber and Sanitary Engineer* truly says: "Modern research has classed these diseases as preventable, and we may be pretty sure that they are governed by physical laws as immutable as the law of gravity, and depending only for their propagation and development upon circumstances and combinations which are within human control, and for which we are therefore to be held responsible."

Having shown the evils which may be produced by bad sanitation in our homes, and how these effects are liable to be produced, we will now give a description of the different sanitary arrangements in general use, pointing out the faults in each, and also naming the ones which are approved by the best authorities, with the reasons for their approval.

The proper general arrangements for the sanitary protection of our homes will be first discussed, then we will proceed to the special arrangements for the same purpose.

It is an advantage for a house in our latitude to have a southern exposure; with it, we get the cool breeze in the summer and the cheering effects of the sun in winter. There are many good authorities who consider sunlight necessary to our health, the Germans making it a requisite in their school plans. With a northern exposure one gets but a cold and cheerless outlook; the front yard or pavement will remain damp and unhealthy, especially if not well drained. Eastern exposure has no advantage over a western; but either eastern or western exposure is preferable to a northern. A lot, in a city, having a southern with an eastern or a western exposure is very desirable, for then we obtain sunlight on three sides of our house; keeps the front and back yards dry and healthy, and adds to our comfort and pleasure. In the country, our house can have windows on all sides, and it is very desirable that buildings in cities should be detached from other buildings whenever it is possible. When thus by itself, a house will be surrounded by light and air that is comparatively pure, and it is much easier so to avoid those abominations, dark rooms, as well as to thoroughly ventilate the house.

In the situation of a house a site must be selected, when possible, where the natural soil is good for the health, and will not harbor disease. The best soil for this purpose is deep gravel or sand, which will readily drain off the water and allow free access to the air. A fertile soil, an impervious subsoil (clay), or rock near the surface retains the water, and thus hastens decay, and makes a suitable atmosphere in which disease germs may live. If it be not possible to select one's building site in regard to the natural drainage, the lot must be drained artificially. Drainage of site and foundation should be done by land tiles having an efficient outlet, but in no case connecting directly with cesspools or sewerage system. The smallest size tiles will answer for the largest house. The bottom of all cellars should be concreted with an asphalt coating on top of the concrete. This will tend to keep the deleterious gases from rising into the house from the ground.

Radiant heat, that is, heat which passes through the air without heating it, and which only heats the bodies with which it comes in contact, is considered less hurtful than heated air. Sunlight and open fires produce radiant heat; stoves, steam and hot water coils, first heat the air, and by that our bodies are heated, and give off a small amount of radiant heat; furnaces give us only heated air.

Heating and ventilation are so intimately connected in our dwelling-houses, that it will be convenient to treat of them together. Stoves and furnaces are the modes of heating most generally used, and the proper material of which they

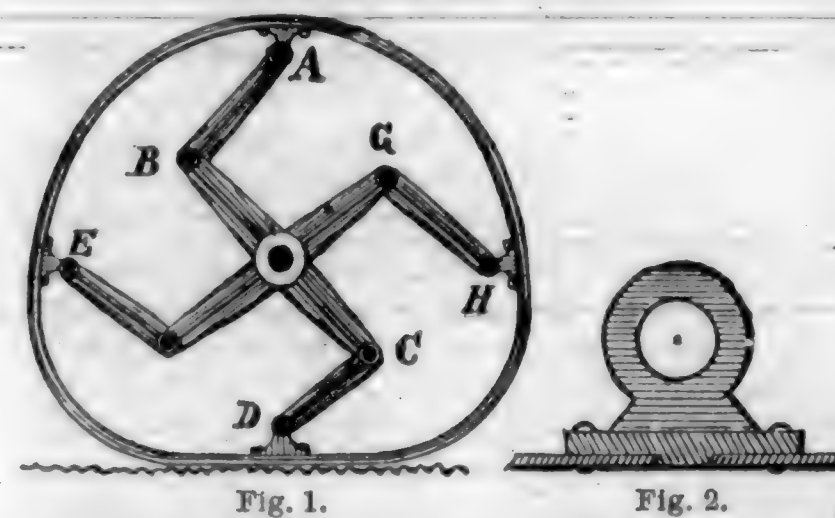
should be made, and how they should be arranged, are matters of importance to the health of households. In this country stoves are manufactured almost exclusively of cast and sheet iron.

On the continent of Europe there are a great many porcelain stoves in use. They are large and unwieldy, and are nearly air tight, thus heating the air in the room, and taking off none of the effete air, except what is withdrawn through crack and joints. Parties who visited the Centennial will remember seeing these porcelain stoves on exhibition. The objection to the use of stoves lies in the fact that they heat the air of the room by actual contact with it, and afford no means of taking away the vitiated air. Of all stoves, the open stove is the most conducive to health, giving off radiant heat, and also allowing egress for vitiated air, thus to a certain extent taking the place of an open fireplace. In selecting stoves for heating our homes, the open or grate stoves should be chosen, and there should be an inlet for the fresh air, either made particularly for ventilation back of the stove, so that the air can be warmed to fifty degrees, so it will not chill any one as it comes in; or the air may be admitted at the meeting rail of the window sash, by letting down the upper and hoisting the lower sash about half an inch. This will not bring the sash above the stop bead, and it will allow the air to enter between the two sashes, the air being deflected upward and thoroughly mixed with the air of the room without causing disagreeable drafts.

In heating stoves care must be taken not to heat them to redness, as Dr. Derby states the gases of combustion will pass through red-hot cast iron.

(To be continued.)

The Paradox Wheel.



So called from its appearance; for, seeing that all the internal parts, *a b c d* and *e f g h*, are pivots which support the whole of the internal parts, and that the cross in the center is also free on the axle after the manner of a pair of scissors, a collapse appears inevitable; whereas the axle continues as firmly in the center as in the ordinary wheel with fixed spokes, and the elastic tire gives way, and flattens on the ground with the same freedom as if the load were merely placed on the top of the elastic tire; and (as I shall show) gives us a base equal to the sleepers which (on a railway) support proportionately a locomotive engine (see Fig. 1). This wheel might also be named the leg wheel, or the walking wheel, from its appearance.

By publishing this invention, I am showing to our readers my "trump card"; for so important is a means of reducing the horse power required for traction on a common road to the same low amount (for the same load) as is required on a railway, that its general adoption would amount to a revolution in locomotion on common roads.

I am aware that others have tried to effect the same object; but one mistake has been to make the internal part of a wheel elastic; whereby the load only descends nearer to the ground, instead of the tire becoming uniformly flat next the ground, as is the case in this invention. In other designs the two wheels on each

side have not been independent of each other, whereby guiding has been prevented.

In order to show that my object has been attained, I will explain why it is that so great a proportionate tractive power is required on the common road.

The common wheel acts somewhat after the manner of a cheese cutter, and grinds to powder annually millions of tons of road metal, and also falls into and has to be dragged out of every rut, little and big; this amounts to a lot of up-hill work, and accounts for the extra power required. By the adoption of my invention these evils are avoided; as there is always a base or foundation sufficient to make the tractive power no more than that of a railway on the same gradients—mind, I say, on the same gradients; which we know are more favorable on a railway.

To compare, let us suppose a cart has 5-foot wheels, and the tire to flatten one-eighth, or about 2 feet; width, say 4 inches; total surface bearing, 1 foot 4 inches; and, say, total weight, 1½ tons. Now, a locomotive engine will weigh about twenty-four times this, which, $\times 1 \text{ foot } 4 \text{ inches} = 32 \text{ feet super}$, for sleepers, which, divided by say 5 sleepers, gives each 8 feet 7 inches long by 9 inches wide, which is not far from the truth.

The tires should be one piece of spring steel, tempered clock spring, of width and thickness as engineering data may dictate. The ends of the tire may be riveted to the bearing, same as the other three, but the ends must be shut into the dovetail, cast as part of one of the four bearings, which is shown at bottom of Fig. 2. The other parts of the tire should be malleable cast-iron.

Other advantages resulting are, that carriage springs are needless, the tires being themselves the springs; and all noise, jolting, and vibrations are done away with, so that the motion will be as easy as can well be imagined.—J. H. Huxley, in *English Mechanic*.

Fine Public Buildings.

Some fault has been found with Congress because of the liberal appropriation for fine buildings in various parts of the country. If, however, there is a surplus of money, it could not be much better employed than in constructing handsome edifices. Our post-offices, custom-houses, and court buildings should be structures worthy of what is destined to be the most powerful nation on the face of the globe. In eighteen years the United States will have as large a population as Germany and France combined, and there will be no richer nation potentially on the globe. The federal government does not come in immediate contact with the people except through custom-houses and post-offices, and it is desirable that our voting population should be duly impressed by the wealth and importance of the country to which they belong. There is no justification for any waste or extravagance, but it is manifestly unwise for federal buildings in any of the States to be cheap or mean structures. New York ought to have a superb custom-house, the finest in the world; a great emigrant depot should also be established in this city under the direct auspices of the federal government, for immigration is not a local but a national matter. Let Americans, wherever they go, see in every large city evidences of the might of the country to which they belong. In Athens, in its glory, architects, sculptors, and artists were not permitted to work for private persons. The State monopolized their services, and the government of the United States should be the especial patron of architects and builders of the better class.—*Real Estate Record*.

Subscription price of this journal is \$2.00 in advance.

EVERYBODY'S COLUMN.

"FAS EST AB HORTE DOGREL."

[While this column is open to all, farmers as well as mechanics, engineers as well as architects, we would call particular attention to one and all to have their questions and the information desired to be in accord, as far as possible, with the interests of this journal and for the carrying out of those principles for which the only monthly of its kind this side of the continent, was established. We will endeavor to answer all questions in a fair and impartial manner, and if it becomes necessary, will furnish cuts for the illustrations of any problem, provided we regard the solution thereof as beneficial to the majority of our readers. We would urge upon our patrons the necessity of being pointed in their questions, concise in the language used; let the writing be distinct, and one side of the paper only to be used; give full name and address, and particularly mention if their proper name shall be used.

We want it distinctly understood that the responsibility of signed articles rests with the authors. Correspondents will please direct all communications to the business manager of this journal—240 Montgomery street, rooms 12 and 13.]

CALIFORNIA ARCHITECT: To find the length of rafters for a quarter pitch roof, I generally use the rule to allow 1½ inches to each foot of half width of building. This works well for short rafters, but does not do on long ones. What are the correct figures to use? S. L. T.

ANS.—The above is a very common rule used where accuracy is but little cared for. It makes the rafters about one half of an inch too long for each 8 feet in length. See our article on Steel Square and its Uses, page 96, this issue.

BUSINESS EDITOR OF ARCHITECT: I want to know of a practical way to describe the arc of a circle too large for a pair of dividers. Please inform me the best way of so doing.

MILLWRIGHT, Santa Clara.

ANS.—Let *a c* be the chord, and *o b* the height of the required arc, as laid down on the drawing. On a separate piece of paper, *s e m n*, draw *a c*, *o b*, and *a b*, also *b e* parallel to the chord *a c*. It is well to make *b s* and *b e* a little longer than *a b*. Then cut off the paper carefully along the lines *s b* and *b e*, so as to leave remaining only the strip *s a b e m n*. Now if the straight sides *s b* and *b e* be applied to the drawing so that any parts of them shall touch at the same time the points *a* and *b*, or *b* and *e*, the point *b* on the strip will be in the circumference of the arc, and may be pricked off. Thus any number of points in the arc may be found, and afterwards united to form the curve.

In answer to E. M., we would say, that the reason he has never found the crushing strength of redwood given in the tables in different works on the crushing strength of materials, is simply because no extended experiments have been made (the results of which have come to our knowledge) of the comparative strength of redwood with other woods. Will inform our readers of such tests when made.

PRACTICAL LESSONS

—IN—

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DELVING INTO THE SECRETS OF THE PAST.

The Lost Arts.

What are the Lost Arts? We often see allusions made to them; "few and far between"—only allusions. Sometimes we may hear some one art specified as a lost art. Nothing very definite, however, and always in a fragmentary way. When we come to give the subject serious study and investigation, we find many vague notions regarding the matter. Persons claiming to be well read speak of the Lost Arts, but are not able to say just what they are. If you, my reader, have a desire to find out by books or any other way what they are, just how many there are, who the people were who know and practiced them, and at what period in history, you will have considerable of a task before you. Go to the best libraries on this coast, hunt through all the encyclopedias, through all the lexicons, phrase collections, art dictionaries, art histories, essays, monographs, and the whole gallery of magazine literature of the last score of years, and you will rise from that weary search, like Ruth from the fields of Boaz, with but few grains of wheat. You may then wonder if anybody knows anything about them. Possibly you may begin to conclude that the story is a myth. Are there any lost arts?

We once wandered over much of this wilderness. In our search we met a wise man whom we approached reverently, and asked hopefully, "Sire, what are the Lost Arts?" He adjusted his memory, and scanning the horizon of the illimitable past, he meditated. But memory came back with no treasure. He only said, "Go to Wendell Phillips—he knows."

Still seeking, I fell in with another wise man, in whom I had reposed much confidence; and I asked, "Sire, what are the Lost Arts?" He closed his eyes a moment and "looked backward." Then with a smile of pity he said, "Go to Wendell Phillips—he knows."

The labor is long, I see; but I will go on. In my search I saw another wise man, and I said, surely he will know; he seems to have traveled far; I went to him timidly, with doubt in my face, and said modestly, "Sire, what are the Lost Arts?" With a serious eye he looked upon me and replied: "Who knows except it be Wendell Phillips? His talk on 'The Lost Arts' will save you much weary seeking."

These wise men all know the same thing, I said. It must be true. Then I set myself to hunting "Phillips's Lost Arts." I remember with what unbounded hope, what expectant joy, I had once gone to sit at the feet of an Apollo, and hear him all through the long evening tell the touching story of "The Babes in the Wood"—that old tale that had so held spell-bound many a young eye in the gloaming; though my childhood had small share of such charm. The old castle, the dear boys, the silent, bad men, the great, dark wood, the pretty redbreasts—all were to come back again, I was sure. But, as you may know, they did not come.

Well, I found "Phillips's Lost Arts"; and it was, I thought, the "Babes in the Wood" over again. Amid the tropical wilderness of Mr. Phillips's beautiful flowers of thought and brilliant rhetoric, it was somewhat difficult to find the Lost Arts. Certainly, they were not catalogued. But it was a museum in which I could ramble. And Mr. Phillips whispered just then in my ear, "Egypt." Then I turned and looked toward the Nile. There was the Sphinx—lithograph of God—still sitting upon the sands where she had sat so long—so long—watching—watching with sad, earnest eyes. She has seen all—everything. She knows everything, I said. I will consult the oracle.

With what we can gather from such histories of Babylon and Nineveh and Thebes and Memphis as we have, and with such suggestions as may come from other sources, let us see what conclusion we may come to as to the Lost Arts.

If Mr. Phillips is correct in his statements, this nineteenth century, up to within the last ten years, has enjoyed little art and few inventions that Egypt and Assyria and Greece and Rome did not know—know better, even, than do we. Has all art been once lost, then? Have these ancient peoples, as he says, anticipated us in every form of art and beauty, even to our stories, our dramatic plots, and our Irish bulls?

It has been supposed, until comparatively recent times, that transparent glass was not known to the ancients. Glass is said, by Roman writers, to have been discovered by accident by the Phoenicians on the Syrian coast. Wilkinson suggests that it is more likely to have been in Egypt, where the materials for glass abound. Real glass was certainly known to the Egyptians at least 4,000 years ago. They did not use it for windows, it is true, for they did not need them; but they did use it for drinking and cooking vessels, for ornaments, and for other purposes. Cut glass was invented by Lehman, an Austrian, at Prague, about 1600. But cut glass and ground glass and glass blown into all shapes required have been found in the tombs of Egypt and the chambers of buried Pompeii. Glass vessels found in Rome, Greece, and Etruria are by shape and pattern known to be Egyptian. So the making of cut glass was a lost art, though making transparent glass may not be.

The Egyptians had the art of introducing different colors into a vessel, which has never been attained by modern workers in glass, with all the improvements that have been made. The best Venetian artists have not reached the Egyptian secret.

Sometimes these bright colors are interlined with gold—blue, green, red, and gold alternating. These were not on the surface, but all passed vertically through the entire substance, so that horizontal sections showed the same pattern. They were mosaics in glass, supposed to have been made by fusing delicate rods of colored glass. Birds and other animal were thus made to perfection in solid glass, the pattern running through and showing the same on both sides, as if cut out of a solid block of colors. The designs of these patterns are often so delicate that parts of figures can be detected only by a lens. Under the microscope, the iridescent colors on a duck's neck can be seen. Such art has never been attained in modern times, we think.

They had the art, also, of engraving on gems: probably done with the diamond. In the museums of Rome and other cities of Europe may be seen seal-rings from Egypt, having engravings of the human figure and other forms too small to be clearly seen by the naked eye. There is a ring shown in the museum at Parma, once worn by Michael Angelo, that has on it an engraving of seven women, the figures so small that they cannot be distinguished without a glass. Mr. Phillips mentions one of this kind worn by a friend of his, that had on it a naked Hercules, the interlacing muscles of which, and the separate hairs on the eyebrows, could be seen, under the microscope. Rawlinson speaks of a stone from Nineveh, only twenty inches long and ten wide, that contained an entire treatise on mathematics. Cicero, quoted by Phillips, says he saw the entire Iliad of Homer written on a skin that could be put into a common nutshell. It is inconceivable that engraving or writing so minute and delicate could be made without the aid of lenses. In fact, lenses have been found in the Assyrian excavations, and doubtless were used in Egypt. But the microscope is a modern European invention. So the knowledge of it must have been lost.

What the famous Murrhine vases were, we do not know. The Roman writers describe them as Assyrian, and made of a stone found only in Asia. It was of many colors, beautifully blended and iridescent. It has been suggested that it was fluor-spar. The Egyptians imitated it in their glass-porcelain.

The Egyptians also had the skill to imitate the finer precious stones. The immense emeralds spoken of by ancient writers are doubtless imitations in glass, as no such stones have ever since been found or known in a natural state. One is named as being six feet long and four and a half feet broad. A statue formed from one stone was thirteen and a half feet high. An obelisk named was sixty feet high, made of four emeralds. To form such figures of glass showed greater skill, even, than to imitate the natural stones. They imitated the colors of all the finer gems—the emerald, the amethyst, the ruby, the sapphire—to the minutest tint, in all their glowing beauty and radiance, so perfectly as to deceive, not only the common people, but the expert; and made pearls that no unaided eye can distinguish from the natural ones. Such art has not since been seen.

The Egyptians were noted for their manufactures of linen, cotton, and woolen cloths; also, for embroidery. These were of such excellence that they were in demand in foreign countries. Cloth of cotton and linen mixed was also made. The wonder is, that the thread was spun, and the cloth woven by means, apparently, of the simplest and rudest machinery. The skill that could produce the fabrics described by ancient writers, on such looms as are figured on the monuments where is seen the actual process of construction, is simply marvelous. And we do not see their best products either, for these were not consigned to the tombs. The beauty of the fine, costly clothing of the rich people of Thebes and Memphis has never been seen—at least, since the glory of Rome declined. It can never be known. Perhaps it perished with the people. A singular feature of those cloths was that the warp had double, treble, or even quadruple the number of threads that the woof had. A specimen in the British museum is thin, transparent, and very delicate in texture. It has 140 threads to the inch in the warp, and 64 in the woof; and the thread is so fine that it required 100 hanks to weigh one pound. There is a specimen of Indian manufacture, shown at the East India house, spun by hand, that required 250 hanks to weigh a pound. Some of these fabrics used for scarfs are fringed like our silk shawls, and woven with a selvedge. Some are ornamented with stripes of indigo-blue and fawn color, the thread being colored before weaving. A specimen found near the old city of Memphis surpasses all others in fineness, having 270 double threads, equal to 540 single threads, to the inch. Its color is a brown, and it is covered with hieroglyphics so finely drawn that the lines can scarcely be traced by the eye. The threads are perfectly even—not a break or knot, as is seen in our best cambrics. The feeling of these linen cloths to the touch is like that of our silk. They had nets, also, for catching fish and birds, of such fineness of structure, that one of them could be drawn through a finger-ring, and each single thread was made up of 150 finer threads. Amasis, King of Egypt, had a corselet the threads of which were formed of 365 distinct threads. It was ornamented with figures of animals worked in threads of gold. Pliny says that the king sent several of these as presents to the Greek rulers. Many of the cloths of Egypt had patterns worked in colors on the loom, as well as those made by the dyeing or printing process. These rivaled the famous fabrics of Babylon, worked with the needle. The invention of weaving threads of gold and silver is said to have been made in Asia. But the art was early known in Egypt, or nearly 4,000 years ago. It was carried to Greece and Rome, and writers

speak of tunics made wholly of threads of gold, worn by Agrippina, Tarquin, and Helioagabalus. All these textures were made by means of implements that we should call barbarous. We may safely say that such art and skill have not been seen since the decline of the Roman empire.

The Egyptians knew how to dye by chemical processes; for they used acids to make the cloth take the color equally, and also to change the color, to give any color they wished. The bright colors used were blue, scarlet, and purple. These are immortal. They have never faded. They are as bright to-day, seemingly, as when laid on. How they made them so, we do not know. We cannot make them, that is certain. In the tombs of Egypt, in the ruins of Babylon, in the buried chambers of Pompeii and Cyprus, the royal purple and scarlet still flame out when brought to light, as they did 2,000 or 3,000 years ago. Even in later times, only 500 years ago, the illuminated misal of the monk shows a color we cannot now produce. Ruskin, lecturing to his art students, says: "We English think we are the best chemists in the world; but we cannot make such a scarlet." The French at Lyons say, "We are the best dyers in Europe"; but the girls in Cashmere will show them three hundred distinct shades that they cannot make, or even hardly distinguish—so Mr. Phillips says.

It is said that the oriental eye can distinguish shades that no western vision can detect. This may explain the Cashmere story; but the art to produce the fadeless colors of Thebes and Nineveh is, we think, a lost art.

By our common chronology, over 3,000 years before the Christian era metals were used in Asia. Mr. Phillips says, "They can work more wonders in them to-day than we can, and they have always done so." He says again, "When the English plundered the Summer Palace of the Emperor of China, they were astonished at the curiously wrought metal vessels of every kind, far exceeding in skill the work of any people in Europe." It has been thought that English steel is the best in the world. But the first quality of English steel put into a chronometer watch or a surgeon's lancet will rust in the climate of India.

"Metallurgy is the glory of chemistry," says Phillips; "and the best steel is the triumph of metallurgy; perfect steel is the marvel of science." Now Sheffield is the great center of the English steel manufacture; but when, to-day, a watchmaker in London wishes the best steel, he has learned to send, not to this scientific center, but to the Punjab of India, where there is no science at all. Oriental steel has been noted through all history. The Indian steel and Damascus steel do not rust. A Damascus blade can be twisted like a corkscrew, and the point made to touch the hilt, and it shines to-day as it did a thousand years ago.

Then, oriental steel will take an edge that no English or Swedish steel will. A Hindoo, says Phillips, will cut floss silk, floating in the air, with his saber. And he tells the story of Saladin, who drew his keen blade across an eider-down pillow, and laid it in two pieces; and severed a scarf, floating almost like gossamer, before it could reach the floor. "Now," he says, "we can produce nothing like this." Then we must say that the art of producing oriental steel and a Damascus blade are lost arts.

Then there are the wonders of the mechanical powers that the Egyptians used with such marvelous results. These results have never been explained. No one can tell the secret. They are unaccountable. We have steam hydraulic power, and many forms of combination of the simple mechanic powers. They had the lever, the inclined plane, and the pulley. How they, with these simple tools, could do the work they did, we don't know. It is a lost art. We can move the obelisk, true. They cut it out of the quarry in one piece, and carried it 150 miles, sometimes 800 miles, and so far as we can know,

by help of their own illustrations, only with the aid of the above rude instruments. Herodotus says they used a crane. Possibly, at any rate they hung the capital of Pompey's Pillar, weighing 2,000 pounds, 100 feet high. The weight of the obelisk before the temple of Karnak, the greatest in Egypt, is given by Wilkinson as 300 tons. There are colossal figures that weighed over 800 tons; and a monolith is named that weighed 5,000 tons. The obelisks sometimes were more than 90 feet long. They could not draw them straight out, on account of the narrow entrance to the quarry. They had to lift them bodily from their bed, and swing them clear. They lifted stones 40 feet long to the top of the docks and to the roofs of their largest temples; all this they did with their primitive machinery. Wilkinson says no insight by their paintings or their sculpture is given into the secret of their mechanical knowledge. So we leave it. We can only read and wonder. It is a lost art.

These are some of the lost arts. There are doubtless many others. Unless we know what ones have been continued through all ages, or at what period certain inventions and discoveries have been made, we cannot always say what are lost arts and what are not. The Hebrews learned many of the arts from the Egyptians and have carried the knowledge to every nation. Some were transmitted from Egypt and Assyria to Greece and Rome, some went out of sight with the decline and fall of these empires, and some were taken up by the races that overran Rome, and so have been perpetuated. The Egyptians understood much of geometry and astronomy, we know. All of what they knew in these sciences has never been communicated to others—at least, has not reached modern times. If they knew all the geometry and astronomy that Smith gives them credit for in his history of the great pyramid, then much of their skill is a lost art. He says they really squared the circle. No modern has ever worked this problem; so that is a lost art.

There are many other things that we have been accustomed to consider modern discoveries, and which have been set down to the credit of modern superiority of ingenuity and invention; notably among these are the steam engine, the railroad, electricity, the telescope. But Wendell Phillips says they had all these in Egypt. He says a French engineer saw the painting of a ship full of machinery, the arrangement of which could be accounted for only on the supposition that steam was the motive power. He says they had canals superior to the Suez Canal; that complete systems of ventilation were used and fully understood by them; that Solomon's Temple was protected by a system of lightning rods. Syphons were invented in Egypt, at least 1,500 years before Christ; and the bellows was in use as early as that. So, says Mr. Phillips, of all the discoveries and inventions of this boasting nineteenth century, ninety-nine in a hundred have been anticipated by the ancients. This is too sweeping, we think; we do not think all the statements can be fully verified. They doubtless knew more than we perhaps credit them with; and they had knowledge of some arts that we have never known—Lost Arts.

To sum up, these are some of them: Mosaics in glass; the introducing animals in colors into solid glass, the figure running through, both sides showing the same; the making of the Murrhine vases; artificial precious stones of mammoth sizes; manufacture of linen cloth that rivaled silk, and cloth of gold thread on machines of simplest construction, and then covered with figures the lines of which are so delicate that the eye can scarcely trace them; large fish nets of such fine texture as to be drawn through a finger-ring; producing colors that have not faded in nearly 4,000 years; metal vessels from China, that surpass the skill of any people in Europe or

America; oriental steel seen in a Damascus blade and a Hindoo cimeter; malleable glass, that Prof. Silliman declares to be a physical impossibility that no amount of evidence will convince him of; glass vessels found in China, though not Chinese, that are miracles of skill, and inexplicable; chemistry that has not even been approached in modern times; mechanic powers that are simply marvels that cannot be explained; and if the statements in regard to their building on astronomical principles the great pyramid are correct, they had a knowledge that would seem must have come by divine revelation. Such are the Lost Arts.

The Willow as a Timber Tree.

And there are some trees which are deserving of more attention than has yet been given them in this country. The willows, for instance, have seldom been cultivated in a large way; and yet there are few trees so easily grown, or which will pay better for cultivation. They adapt themselves to a wide range of soil and climate. They grow on high ground and on gravelly soils not less than by the sides of streams, where we most commonly see them. They are of rapid growth, and yield a large return. The osier-willow is especially useful, we know, for the manufacture of baskets, chairs, and other articles of furniture, and we import it to the extent of \$5,000,000 annually, when we might produce it easily in almost any part of our country. We hardly think of the willow as a timber tree or for the production of lumber, but only as yielding a cheap, poor sort of fuel. But in England the wood is greatly prized for many purposes. While it is light, it is also tough; it does not break into splinters. Hardly any wood is so good, therefore, for the lining of carts and wagons used in drawing stone or other rough and heavy articles. It makes excellent charcoal, especially for the manufacture of gunpowder. It bears exposure to the weather, and boards made of it are very serviceable for fences. Some species of it are admirable for use as a live fence or hedge. On account of its comparative incombustibility, the willow is eminently useful for the floors of buildings designed to be fire-proof. It grows to a large size and furnishes a great amount of lumber. There is a white willow growing at Stockbridge, Mass., which at four feet from the ground measures twenty-two feet in circumference, and extends its branches sixty feet in every direction. Tradition says it was brought from Connecticut in 1807 by a traveler, who used it as a riding switch. The Hon. Jesse W. Fell, in giving an account of experiments in tree-planting on an extensive scale in Illinois, says: "Were I called upon to designate one tree, which, more than all others, I would recommend for general planting, I would say unhesitatingly it should be the white willow." Prof. Brewer says: "In England, where it is often sixty to seventy feet high in twenty years, there is no wood in greater demand than good willow. It is light, very tough, soft, takes a good finish, will bear more pounding and knocks than any other wood grown there, and hence is used for cricket bats, for floats to paddle-wheels of steamers, and brake-blocks on cars. It is used extensively for turning, planking coasting vessels, furniture, ox-yokes, wooden legs, shoe-lasts, etc." Fuller says: "It groweth incredibly fast—it being a by-word that the profit by willows will buy the owner a horse before that by other trees will pay for a saddle." The basket willow, well cultivated, will yield a net income of \$150 a year to the acre. On the whole, therefore, it would seem that the various kinds of willow, the economic value of which has been hitherto entirely overlooked in our country, are eminently deserving of attention, and will amply reward those who cultivate them.—Popular Science Monthly.

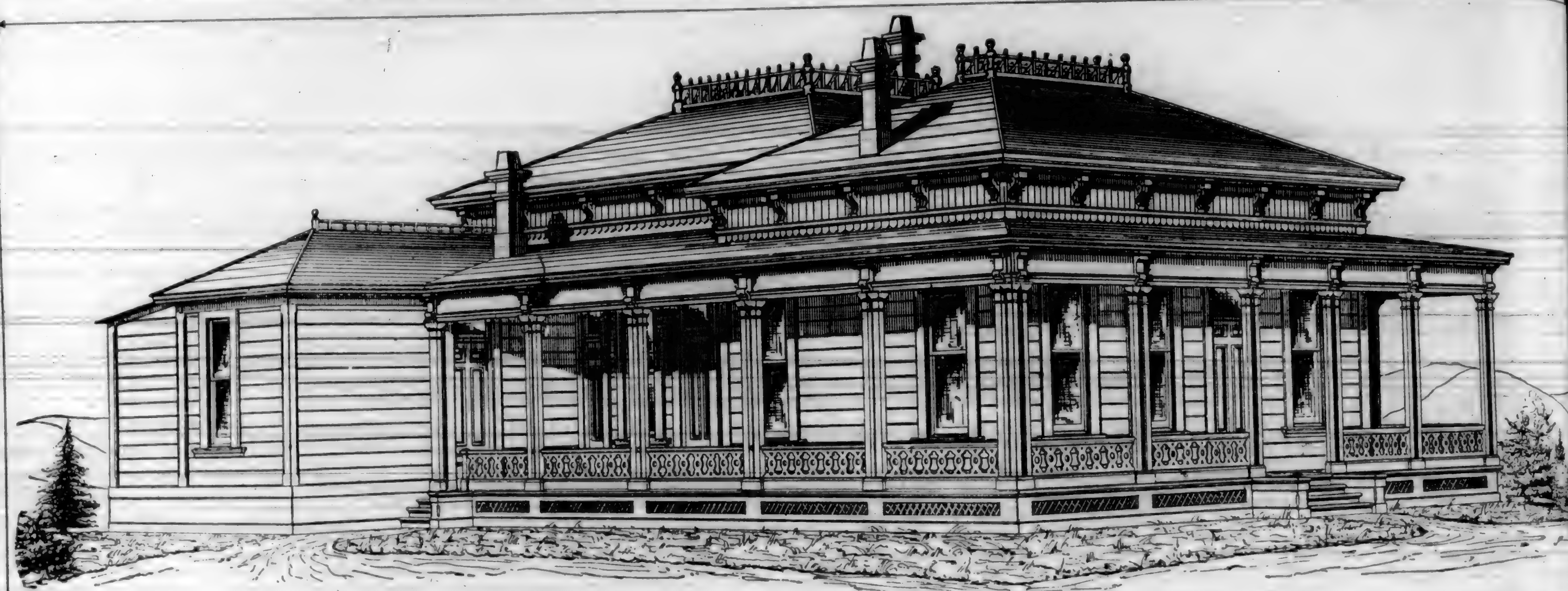


PLATE 1.—PERSPECTIVE VIEW OF COUNTRY DWELLING.

Our Illustrations.

Plate 1 is the perspective of a very convenient country house; Plate 2 being the front elevation, and Plate 3 the side elevation. It is the intention to make a large attic over the dining and sitting room portions of the building, to be used for a store-room and the apartments of the "hired help" during the harvest season. Plate 4 is the ground plan.

Garfield Memorial.**EASTERN COMMENTS.**

We advise our young readers who are sometimes tempted to throw away their time and reputation by entering into second-rate competitions, to read in the CALIFORNIA ARCHITECT AND BUILDING NEWS the comments upon the designs submitted for the Garfield Memorial which the people of California are intending to erect. As every one may not have heard of this artistic event—the most important one in the history of the Pacific Coast—we ought, perhaps, to premise that some months ago circulars were sent out announcing that it was in contemplation to spend some twenty-five thousand dollars, if we recollect rightly, upon a monument which should do honor at once to our late lamented President and the people of California, and inviting competitive designs for the structure, upon terms the most discreditable to the individuals offering them, and the most degrading to those foolish enough to accept them, which we ever saw in print, except, perhaps, those set forth in the amazing invitations by which State house commissioners south of Mason and Dixon's line encourage the fine arts. In brief, all the persons desirous of immortalizing their names in connection with the California Garfield Memorial were required to furnish full working-drawings, specifications, and details, the proper value of which should be at least fifteen hundred dollars for each set, and were promised in return that one among them might be chosen to receive the magnificent sum of three hundred dollars, for which he would be obliged to abandon his drawings, papers, and models absolutely to the committee, and sign a receipt in full of all claims and demands. Although architects are popularly supposed to have an idiotic passion

for doing work for nothing, even the Californians, unaccustomed as they are to such contests, were attracted by the disparity between the service asked for and its reward, and have come by insensible degrees, as the extract well shows, to look upon the competition as a farcical combat between objects of deserved ridicule, whose struggles after a preposterously inadequate prize afford legitimate sport to the more rational lookers-on. To a certain extent their opinion is justified, and although we can pity the folly of those who responded to the almost insulting invitation, we must condemn them as having done what they could, not only to lower themselves and cloud their own future prospects, but to degrade and injure the profession to which they claim to belong; and it will do no harm for the Californians to consider at the same time, while they are laughing at the "Nightmare-Mauresco-Japanese" models offered for their choice, whether the mode which they have adopted for securing a design for their costly monument without paying the designer seems likely to prove entirely successful.—*American Architect.*

Laying Walnut Veneer.

First have the veneer and the surface to be veneered very smooth, by going over with a fine toothed plane to make out all saw marks. The veneer must be left a little larger than the surface to be covered. The wood—not veneer—must be well mixed with thin glue; you can do this by dipping the brush in the glue and then in the boiling water, and then allowed to dry. Have very good glue, boiling hot, laid on the wood and veneer, lay the one on the other, and then well press together, having first damped that side of the veneer not to be glued with hot boiling water by a sponge. If a large piece, it will require a hot iron run over the surface to keep it down. It will all spoil if the iron is too hot. It must be clamped or weighted by laying boards on all night.

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Palliser's American Cottage Homes, illustrated by 260 drawings, with forms of contract, specifications, sections, details, etc. We are the only agents for this new work on this coast. On receipt of the publishers price, \$5, we will forward a copy to any address.

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Making Artificial Stone.

A compound for artificial stone, which has received late protection by patent, consists of three and one-half parts of clean sand to one part of Portland cement, mixed thoroughly, and combined in a working consistency with a composition consisting on the one part of five gallons of water, and on the other part of one gallon of the mixture made of the following ingredients and in the following proportions, to wit: one gallon of silicate of soda, one pound of carbonate of iron, one and a half pounds of graphite, two pounds of raw umber, and two gallons of rain water at the boiling temperature, and all thoroughly mixed.

American Cottage Homes.

A very valuable work containing 40 plates, 9x12 inches, with over 260 drawings, of low-priced cottages and workingmen's homes. It also contains forms of contracts, specifications, and a full description of each plate. Sent to any address upon receipt of \$5.

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HOBART B. IVES, NEW HAVEN, CONN.
Sole Manufacturer and Patente.

Sold by
all Hardware
Dealers.



PLATE 2.—FRONT VIEW OF COUNTRY DWELLING.



PLATE 3.—SIDE VIEW OF COUNTRY DWELLING.

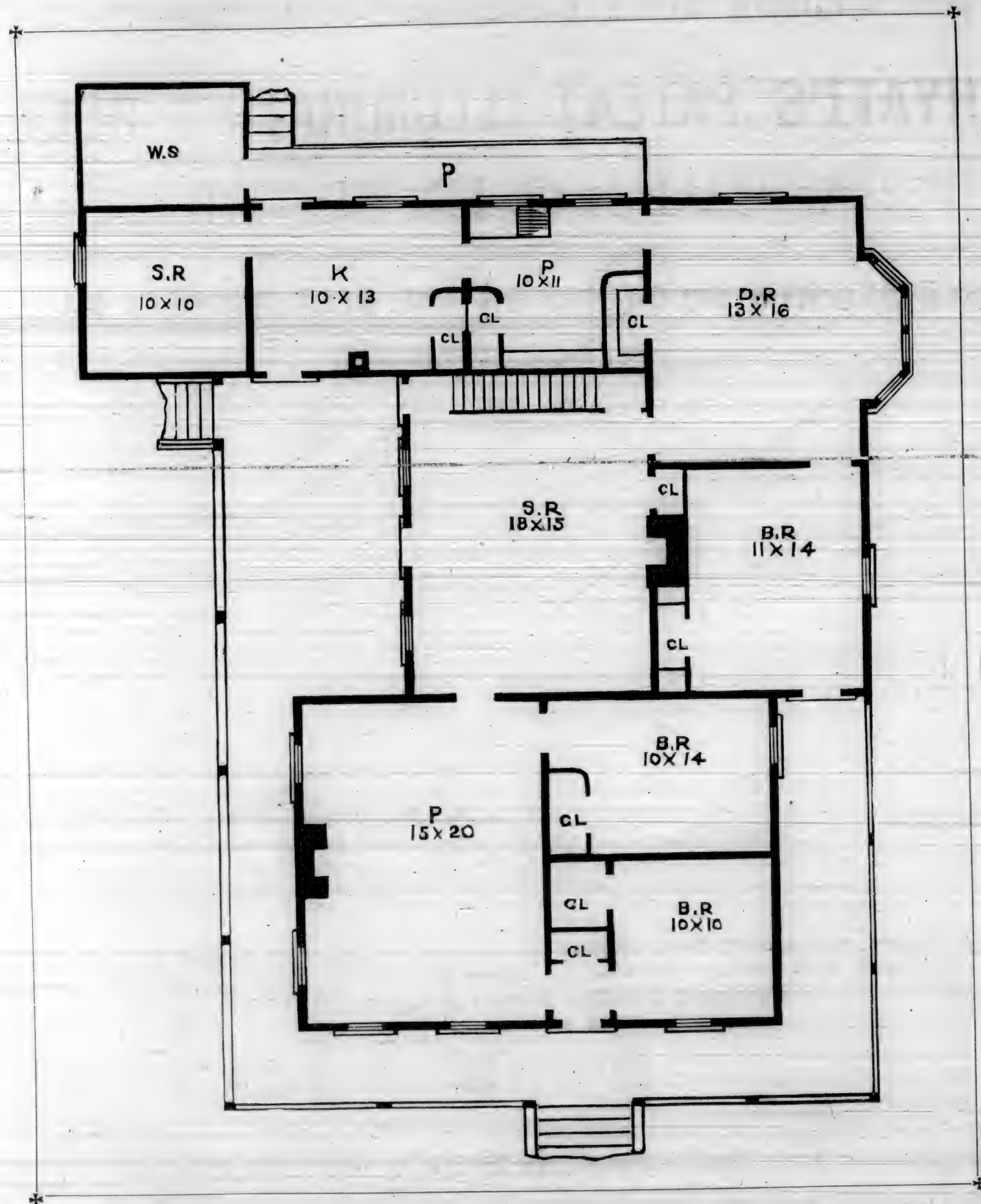


PLATE 4.—GROUND PLAN OF COUNTRY DWELLING.

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In the Business Part of the City by using

HYATT'S PATENT ILLUMINATING ROOF —AND— BASEMENT EXTENSION.

THE LENSES MAGNIFY, HEAT, AND DO NOT BREAK.

SEE ALL NEW BUILDINGS ON THE BEST BUSINESS MART.

The present dark, damp Cellars, or Coal Vaults, of old buildings made light, cheerful, and well-ventilated Business Apartments suitable for Offices.

Read the following of the many Testimonials received:

MESSRS. P. H. JACKSON & CO., No. 2 California Street:

LEVI STRAUSS & CO., Importers, 14 and 16 Battery Street,
SAN FRANCISCO, March 4, 1881.

The alteration made by you by cutting out the six door sills and risers on the front part of our store, 14 and 16 Battery Street, and substituting HYATT'S PATENT ILLUMINATING ROOF, is quite satisfactory in making in the basement apartment below, in the front part, all that we could desire as regards light. Our entry clerks are now able to work without the use of gas.

LEVI STRAUSS & CO.

The Basements of Messrs. Murphy, Grant & Co's Buildings, on Bush and Sansome Streets, have been altered and are now lighted by this Improvement.

HYATT'S PATENT FIRE AND BURGLAR-PROOF SKYLIGHTS.

The Public are requested to examine the large quarter circle skylights, recently erected in the rear of Senator Fair's building corner Sansome and Pine. Also A. B. McCreery's building corner of Pine and Davis. By the use of these heavy Skylights, which are both fire and burglar-proof, no extra charge in rates is made by the Insurance Companies than if no Sky-lights were used, as they are not destroyed by fire, like the wood and sheet-iron skylights in common use; besides the occupant of the premises may feel his goods are safe from robbers during the time the building may be closed.

There are many deep stores in this city that are much in need of light, and by an addition of these Skylights all light can be obtained, besides security against thieves is maintained.

The appearance of the Skylight, as seen from the front of the store when the sun is on it, glistens with the thousands of hexagon lens. The Cosmopolitan Building, as altered, has these Skylights on the rear of the deep stores.

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Sole Licenses and Manufacturers for the Pacific Coast of Hyatt's Patents,
No. 2 California Street and No. 231 First Street,
SAN FRANCISCO.

between Ellis and Olive avenue. O. J. P. Mead; A. J. Gosling; C. T. J. Hamilton; cost, \$2,500.
Two one-story frame corner Fifteenth and Dolores. O. Mrs. E. Bolton; day's work; cost, \$2,600.
Additions and repairs on Minna street, between Third and New Montgomery. O. Sisters of St. Vincent School; C. F. Crowley; cost, \$4,000.
Two-story frame corner Sanchez and Dorland. O. C. B. Williams; day's work; cost, \$2,500.
One-story and basement frame cottage, Church, near Twenty-first. O. W. Colton; A. W. Schrot; C. A. J. Brown; cost, \$2,000.
Repairs and additions to three-story frame on Fifth street, near Howard. O. N. P. Perrine; C. J. T. Whitney; cost, \$3,000.
Brick building on corner of Greenwich and Battery. O. Captain Roxbury; A. Pelton; cost about \$30,000.
Two-story frame building on Tenth street, between Bryant and Brannan. O. E. Lord; day's work; cost, \$2,250.
Two-story frame dwelling corner Connecticut and Napa. O. and H. C. M. Hayes; cost, \$4,000.
Buildings South San Francisco, between Fifteenth avenue and Tenth creek. O. Poly, Heilbron & Co.; C. H. G. Giles; cost, \$4,500.
Repairs to two-story frame on Seventeenth avenue, near R. R. avenue. O. L. Funcke; C. F. Barker; cost, \$2,500.
Three-story and basement frame on Kentucky, near Sierra. O. V. Bellman; A. Geo. Bordwell; day's work; cost, \$5,000.
Two-story frame on Kentucky, near Sierra. O. H. McCrea; C. B. F. Ellis; cost, \$2,500.
Repairs to building junction Market and Turk. O. Coll Deane; C. E. Farrell; cost, \$3,000.
Repairs to frame Powell, between Ellis and Eddy. O. E. J. Stoddard; A. Schmidt & Havens; C. O. E. Brady; cost, \$5,000.
Two-story frame, brick basement, N. W. corner Union and Steiner. O. H. Holmeier; C. A. H. Taylor; cost, \$3,800.
Two-story and attic frame dwelling N. corner Jackson and Fillmore. O. and B. — Shepherd; cost, \$5,000.
Two-story frame, brick basement, N. E. corner Fillmore and Wilder. O. — Logan; A. H. T. Bester; C. A. Jackson; cost, \$3,500.
Two two-story frame dwellings on N. side Bush, near —. O. and B. — Edwards; cost, \$4,000.
Repairs to two-story frame 1218 Jackson street; O. — Bruce; C. J. Grant; cost, \$2,500.
Two-story frame N. side Filbert, between Laguna and Buchanan. O. — (Galloway); C. J. Geary; cost, \$1,500.
One-story and basement frame E. side Belkemann street, between Ellis and O'Farrell. O. J. Connell; day's work; cost, \$1,400.
Alterations and repairs to three-story frame S. side O'Farrell, near Pierce. O. P. H. Jones; C. J. F. Bryne; cost, \$1,500.
One-story frame cottage on Eleventh avenue, near R. R. avenue. O. J. A. C. Dirks; C. O. E. Dunshie; cost, \$1,600.
Additions to slaughter-house, First avenue. O. Poly, Heilbron & Co.; C. H. G. Giles; cost, \$1,500.
Two-story frame addition to St. Joseph Orphan Asylum, Eighteenth avenue, between Q street and Silver avenue. C. H. G. Giles; cost, \$1,000.
Two-story and basement frame dwelling, Sierra, near Kentucky street. O. R. J. Linehan; C. T. Sullivan; cost, \$1,800.
Two-story frame dwelling corner Sierra and Iowa; O. J. Gillick; C. O. E. Dunshie; cost, \$1,800.
Alterations and additions to two-story frame dwelling, Iowa street, near Solano. O. Mr. McLean; C. B. F. Ellis; cost, \$2,500.
One-story frame, Nebraska, near Alameda. O. Mrs. M. Kelley; A. McDougall & Son; C. J. S. Hupp; cost, \$1,250.
One-story frame corner Twenty-fourth and Treat avenue. O. J. Alpers; C. J. H. Wyman; cost, \$1,500.
One-story frame, Church street, between Twenty-second and Twenty-third. O. Mr. Mayhew; C. W. Walsh; cost, \$1,300.
Two-story frame corner Fourth and Bryant. O. Buttgenbach; C. O. Ratz; cost, \$1,000.
Alterations to frame, Sixteenth street, near Dolores. O. Mr. Anderson; C. C. M. Mason; cost, \$1,600.
Repairs to one-story frame corner Sutter and Lyon. O. E. Lyon; day's work; cost, \$1,000.
Repairs to frame dwelling, Folsom, near Ritch. O. Mr. Seller; C. — Barker; cost, \$500.
One-story frame, Post, between Baker and Lyon. O. Mrs. Katie Lyon; C. J. W. Smith; cost, \$600.
Repairs to two-story frame, Turk, near Buchanan. O. and B. — Hartman; cost, \$400.
Mission, near Twentieth, one-story frame. O. and B. — Small; cost, \$900.
Alterations to two-story frame, Page, near Gough. O. — Werth; C. H. J. Weiss; cost, \$900.
Alterations, Doro street, between Bryant and Brannan. O. Thomas Hagan; C. B. Franklin; cost, \$750.
Alterations, Kentucky, near Sierra. O. V. Bellman; C. J. Rose; cost, \$500.
Repairs, N. side O'Farrell, near Laguna. O. Lane; C. J. G. Bernard; cost, \$1,000.
Repairs, S. side O'Farrell, between Pierce and Scott; O. H. Doscher; day's work; cost, \$900.
One-story frame S. side Bush, near Scott. O. Mrs. Wolert; day's work; cost, \$900.
Alterations and additions to two-story frame S. E. corner Jackson and Taylor. O. Lloyd Tevis; A. Kenitzer & Rain; day's work.
Two-story and basement, double dwelling, E. side Pierce, between California and Sacramento. O. and B. Thomas Rendall.
Two-story frame N. side Market, between Fifteenth and Sixteenth. A. T. J. Welch; C. J. L. Binet.
Three-story addition to 450 Bryant. O. J. Curry; C. — Ingerson; cost, \$1,600.

SACRAMENTO.

Two-story and basement brick building on J street, between Tenth and Eleventh. O. J. Brunner; cost, \$9,000.
Brick building on Second street, between I and J. For depot of Omaha White Lead Co. O. Rodfield & Tevis; A. Newsom & Gash; C. Geo. D. Nagle; cost, \$17,000.

Building for the First Artillery Regiment. C. M. Madden; cost, \$9,600.

OAKLAND AND VICINITY.

At Emory Station, West Oakland, the Judson Manufacturing Company are erecting works and buildings for the manufacture of nails, etc. They consist of two two-story frame, brick buildings, three one-story frame, two one-story brick buildings, and one one-story and basement brick building. A. G. P. Clapp; C. E. R. Forsythe; cost about \$50,000.
Two-story frame, West Oakland. O. — King; cost, \$5,000.
Six one-story frame cottages on Division street, between Cedar and Bay. O. T. Page; C. J. Underwood; cost, \$4,200.
Two-story frame corner Eighth and Willow. O. R. Orth; C. Knowles & Weilby; cost, \$2,500.
Repairs to frame, Chester, near Seventh. O. T. Kenney; C. T. F. Broderick; cost, \$500.
Repairs to two-story frame corner Ninth and Chester. O. Y. Abrego; C. R. P. Sanches; cost, \$750.
Two-story frame corner Twelfth and Center streets. O. — Peters; C. W. H. Curtis; cost, \$2,500.
Three frame cottages, Eighth, near Eighteenth. O. Hon. P. Thompson; A. Matthews & Son; C. F. Dahl; cost, \$6,000.
One-story frame cottage corner Franklin and Fifteenth. O. L. W. Wessig; A. Matthews & Son; C. F. Dahl; cost, \$2,000.
One-story frame cottage at Highland Park. O. E. C. Sessions; A. Matthews & Son; C. Brown; cost, \$3,500.
Corner Eighth and Franklin, two-story frame. O. P. Boogar; C. — Denke; cost, \$2,400.
Two-story frame cottage, Thirtieth street, between Wood and Willow. O. J. Fahrenholz; A. McDougall & Son; C. S. Hatfield; cost, \$1,500.

SEATTLE.

Two-story brick building on Commercial street. O. McNaught, Walker & Renton; C. McDonald & Reitze; cost, \$9,500.
Two-story and basement brick building. O. Boyd & Pond; A. W. E. Boone; C. — Rank & Lohse; cost, \$18,000.
Two-story brick building—city offices and engine house. O. E. W. Kea; cost, \$8,000.
Frame building for M. E. Church. A. W. E. Boone; day's work; cost, \$8,000.
Two-story frame building for Sisters of Charity; day's work; cost, \$2,000.
Frame building for the Catholic Society. A. Donald McKay; cost, \$3,000.
Three-story brick building. O. J. H. Marshall; A. W. E. Boone; C. J. Keenan; cost, \$18,000.

ASTORIA.

Three-story and basement brick building. O. L. O. O. F. Association; A. Clinton Day; cost, about \$30,000.

MARTINEZ.

Two-story frame dwelling, brick foundation, near town. O. Dr. Strenzel, A. Wolfe & Son; C. Sylvester & Langabe; cost, about \$9,000.

MISCELLANEOUS.

ST. HELENA.—One and one-half-story frame dwelling. O. Wangermann; C. W. H. Caplan, Jr.; cost, \$2,250.
Frame school-house. O. —; cost, \$2,250.
N. E. — Two-story brick building on Brown street. O. G. Miglavacca; C. George Weidberger; cost, \$3,000.
SAN PABLO.—Frame cottage for Father Cummings. C. Kennedy & Co.; cost, \$3,500.
TEMASCAL.—Two-story frame dwelling. O. C. Taylor; day's work; cost, \$2,500.
One-story frame. O. G. Bassi; day's work; cost, \$1,500.
Two-story, attic, and basement frame. O. Ladies Relief Society; A. McDougall & Son; C. A. Herbst; cost, \$23,000.
WEST BERKELEY.—Additions and repairs to the West Berkeley Mill. O. Schuster & Niehaus; cost, \$3,800.
BERKELEY.—One-story cottage. O. — Flint; C. C. R. Lord; cost, \$2,000.
Near Gas Works, one-story and basement frame. O. Mr. Plant; C. C. R. Lord; cost, \$1,000.
COLUSA.—Repairs to building; new barn. O. D. N. Arnold; A. Matthews & Son; day's work; cost, \$3,500.
WILLOW.—Three-story frame building for hotel. C. Carle & Croly; cost, \$16,500.
MODESTO.—Building for stores. C. Carle & Croly; cost, \$12,400.
SAN RAMON.—Two-story frame cottage. O. Aug. Hemme; A. H. C. Macy; C. J. McCready; cost, \$5,000.
MISSION SAN JOSE.—Three-story brick building for seminary. O. Very Rev. J. S. Alemany; A. F. Hume; brick work. O. E. Brady; carpenter work. J. L. Binet; cost, \$25,000.
BIOCS.—Two-story frame barn. O. Major Biggs; C. J. W. Myers; cost, \$900.
Two frame dwellings near town. O. W. T. Boulivare; C. J. W. Myers; cost, \$2,000 each.
Frame barn by same parties as above. Cost, \$1,000.
RED BLUFF.—One-story brick building on Main street. O. Independent Order Good Templars; A. Hans Hansen; C. Johnson & Saffell; cost, \$9,500.
REDDING.—Court-house and jail. C. A. J. Bryan; cost, \$11,000.
SAN JOSE.—One-story brick building. O. Electric Light Co.; C. J. C. Drew; cost, \$2,350.
STOCKTON.—One-story and basement brick warehouse corner Main and Sacramento. O. Continental Oil Company; A. Newsom & Gash; C. G. D. Nagle; cost, \$11,000.
TAMPA.—Post-houses, summer-house, etc. O. Hall McAllister; A. Newsom & Gash; C. McCann & Jeffers; cost, \$2,500.
BYRON SPRINGS.—One-story frame hotel, and additions to old building. O. L. R. Mead; A. Newsom & Gash; C. W. Jess; cost, \$4,000.
REDFORD CITY.—One and one-half-story frame cottage. O. Horace Hawes; A. Schmidt & Havens; C. J. Lenzen; cost, \$6,500.

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San Francisco's Garfield Monument.

The committee having the matter in hand have decided the awards of premiums, and selected and adopted the design which they have been pleased to denominate the best of the more than twenty designs and models submitted. In this they have defied the opinions and criticisms of the press and public, and virtually asserted that they, as a committee, were masters of the situation, and were endowed with aesthetic discrimination and wisdom far greater than the thousands of contributors and others who failed to discover intrinsic merit in any of the designs presented sufficient to warrant adoption.

But the committee having the authority to act, and there being no power greater to restrain their actions, they have bravely resisted the will and pleasure of the greater number, and carried out their own views. How far this course may redound to the credit of the gentlemen of the committee remains to be seen; but during the lifetime of many now living, the monument, when erected, will be looked upon by hundreds as one of the errors of the period, although the masses may forget the circumstances surrounding the procurement and adoption of the design, and may admire it for what it is worth, remembering more the grandeur of the character to whose memory it will be dedicated than the mistakes of the men who manipulated its erection.

In addition to the ill-advised course pursued by the committee in the matter of premiums, the withholding of superintendence, etc., a wide breach of equity was permitted, in allowing those who wished to submit models in competition with drawings, thereby giving a large advantage to the model contestants. Had the design presented in the model adopted been reduced to a paper drawing, it is questionable whether it would have received the first award. On paper it might not have made so good an impression; while if two or three of the paper designs had been worked up into models they would quite as likely have been preferred.

Another injustice was done, even as far as the models were concerned. That submitted by

Mr. Wells certainly possessed considerable if not equal merit with that of Mr. Happensberger, whose model design received the first premium. But the latter was larger and more imposing in appearance, and in size overshadowed that of Mr. Wells. So that in a multiplicity of ways, the affair has been a series of errors.

If the committee had been composed of men qualified for the duties assigned it, they would have established such equalities as would have made matters work fairly between all parties: such as prescribing that all designs should be in drawings, or all models; and if the latter, then the size and proportion should have been regulated, as no one but the committee could prescribe and regulate that feature. It was not possible for the contestants to fix a standard, each working according to his own judgment, and so far rendering it a matter of chance as to who should happen to hit upon the more acceptable and captivating proportions. However, the matter is ended by the adoption of a design which will look very nice when completed, and some may think it beautiful, and perchance we may be among its admirers when we shall have forgotten the questionable and unfair procedure of the committee, and also lost sight of the fact of how much more handsome a design might have been obtained.

We have no personal acquaintance with Mr. Happensberger, nor any sentiment or feeling adverse to that gentleman, and we congratulate him upon his success, and hope that he may be successful in every undertaking of his life. And we are also right heartily glad that California has produced a man to the manor born, to bear off so enviable a prize.

Our Modesty, and a Subscription Boom.

A sense of delicacy on our part restrains us from urging and pressing our claims for patronage to the extent justified by the facts surrounding and entering into our publication work.

That we have succeeded in producing and establishing upon a permanent basis in San Francisco a journal which ranks most favorably with the best of like publications east of the Sierra Mountains is fully confirmed by the voluntary credit bestowed upon us from all quarters of the United States, and from countries beyond the broad Atlantic and Pacific oceans.

And if this be true, as true it is, then we hold that the people of the Pacific Coast should rally as one man to our support, and at once increase the number of regular paying subscribers beyond all parallel in publication ventures of this character.

NOT ONLY ARCHITECTS, nearly all of whom in California favor us with their subscription, and like good and true men—with two or three exceptions—promptly pay the \$2 yearly subscription; NOT ONLY CONTRACTORS, hundreds of whom are among our prompt paying patrons; NOT ONLY JOURNEYMEN MECHANICS, multitudes of whom are anxious for the date of publication to roll round, that they may reap the information and instruction to be found in each succeeding number, a large majority of whom PAY LIKE HONEST MEN for what they receive, while the lesser number, who waste a hundred times the amount of each year's subscription in the baser pastimes of beer-drinking and corner-grocery allurements, preferring to pilfer and obtain the wealth of our columns at our expense, or the expense of those who entertain the opinion that a journal worth reading is worth the coin, and should be paid for; but every OWNER OF REAL ESTATE,

whether improved or unimproved, all HEADS OF FAMILIES, and ALL CLASSES OF PERSONS, without distinction as to calling or occupation, should subscribe for this journal, because it contains matter and information not to be found in any other journal published within the Pacific States, and of a character full of vital importance and deep interest to every one, involving as they do the proper construction of building, and the all-essential, the sanitary features and problems in connection with the erection of homes for loved ones, and abiding places for those who dwell in rented houses.

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Besides all of which, we submit the question, whether the enterprise displayed in working up and perfecting a journal of its present high standing does not merit and deserve a large and liberal support from the people of the Pacific States? Then let all who can, subscribe; and that none may have reasonable excuse, we will furnish this journal free of charge to all those who are really unable to pay \$2 per annum, and will so state and verify their case to us.

Novel Insurance Case.

A novel case in insurance law is reported in the *Fireman's Journal*. It seems that the owner of a certain building applied for insurance upon it, and received two policies of twenty-five hundred dollars each. As it turned out, at or about the time of the delivery of the policies the property intended to be insured was actually on fire, and the question arose whether the insurance companies were liable for the loss. According to the authority quoted in the *Journal*, the decision must turn upon the precise time of the beginning of the fire, which a jury would have to determine according to the evidence. If the contract of insurance was consummated, or, as the lawyers say, "the minds of the parties had met," before the breaking out of the fire, the companies would be liable, even if the policies had not been delivered; but if at that moment the fire had actually begun, then there was no liability, for the reason that the subject-matter of the contract of insurance—the house—was no longer in the condition in which it was assumed to be, and which formed the basis of the contract, since no one would knowingly insure a burning building. On the other hand, the same authority remarks that if a policy of insurance should expire during the progress of a conflagration in the building covered by it, the company issuing the policy would be held for the whole loss, even though the fire might have just commenced at the hour which terminated the policy, and the main part of the destruction might have occurred subsequently.

American Institute of Architects.

It is announced that the next convention of the American Institute of Architects will meet on the 25th of next October, at the Gibson House in Cincinnati. Special arrangements have been made for the accommodation of members and others present, and it is urged that the various Chapters of the Institute make their representation as large as possible, on the ground that Cincinnati is a city specially interesting to the profession.