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A STORY is going the rounds of the newspapers to the effect that the sewage-farm which receives the drainage of the new model town of Pullman, Illinois, closed its accounts for the present year with a profit of eighty-five hundred dollars. The paragraph, as it came to us, went on to say that the area under cultivation was sixty acres, and that the cost of the sewerage works was eighty thousand dollars, so that the result showed a profit of five per cent upon the investment. We need not call attention to the fact that eighty-five hundred dollars is not five, but nearly eleven per cent on an investment of eighty thousand dollars, and that, moreover, a net profit of eighty-five hundred dollars in a single year from the cultivation of a tract of sixty acres, sewage or no sewage, would imply extraordinary farming, quite independent of any engineering, so that there is apparently a mistake somewhere; but with all allowance for exaggeration or error, the statement, if it is not a pure fabrication, would seem to indicate that the Pullman sewage-farm has during its first year of operation proved in some degree an economic success. We will only say that this report, if it should be confirmed, would constitute the most important piece of engineering intelligence which has been published for a hundred years. If a single town of seven or eight thousand inhabitants has been able, by distributing its sewage upon land selected for that purpose in its vicinity, to gain in return a net profit large enough to pay five per cent interest upon the cost of the sewerage system and the irrigated territory, we may predict with confidence that no more pipes will ever be built for spoiling rivers and harbors with filth.

YET there is nothing inherently improbable in the Pullman rumor. The town sewage-farm, which comprises an area of fifteen hundred acres, although only a part is used for irrigation, is old and exhausted prairie land, admirably adapted for restoration, by proper manuring, to its old fertility. The two years since the drainage works were established give rather a short time for subduing the soil and bringing it back to something like normal productiveness, but the fertilizing effect of frequently repeated applications of diluted manures is so extraordinary that almost anything might be believed of a well-managed farm, irrigated sufficiently, but not too copiously, with liquid house-wastes collected separately from storm and subsoil water. It is said that in Belgium, where cultivation is carried on with great care, the average yield of wheat to the acre, from ground which has been closely tilled for three thousand years, is about four times that obtained from the virgin soil of our own Red River region, which, although now the richest natural grain district in the world, is losing its wheat-producing quality with each successive harvest. This striking difference in productiveness between well-managed old land and the richest natural ground well illustrates the advantage to be derived from the application of cheap and easily-distributed manure to an exhausted soil, and the sight of the brambly deserts which surround most of our large cities within a radius of thirty miles from the outfall of the sewers which convey millions of tons of liquid manure annually to the sea cannot but suggest a wish that the means might be found for ameliorating the one by the judicious use of the other. It is not a little remarkable, as an instance of the great economic importance of the proper use of fertilizers, that while the pine forests of the Northwest are being laboriously cleared away and burned off to make room for grain, the fields of southern Massachusetts, which grew abundant crops of wheat not many years ago, are everywhere being sown with the seeds of pine trees; the very plant which our great-grandfathers destroyed, to make room for more valuable crops, being now the most profitable growth to be obtained from the land which has in half a dozen generations become practically sterile. It is hardly too much to say that for such districts as these sewer irrigation affords the best hope of reclamation. No farmer ten or fifteen miles from the nearest town could think of buying and transporting ordinary manure enough to restore an old pasture lot of a hundred acres to fertility. He can keep a small vegetable garden in good condition, but with the rest of his land there is nothing to do but let it grow up with timber. His neighbors are in the same condition with himself, and the district in which they live is thus left desert, with the exception of an acre here and there of ploughed land, and something more of haying ground in the alluvial valleys. The sewage of a city like Boston furnishes exactly the means for restoration of such land on a comprehensive scale. At a moderate estimate, the fertilizing value of city sewage, properly applied, is about two dollars a year for each inhabitant, and if the sewage could be brought where it is wanted, an annual tract of fifty or a hundred thousand acres might be restored to a productiveness which, with greater care in future, might be made permanent.

A VERY singular accident occurred recently at Moerlein's brewery at Cincinnati, which should convey a warning to those who may have to do with ice or cooling machines. The cellars of the brewery are cooled by ammonia-gas, which is carried through them in pipes, and is made to abstract heat from the surrounding atmosphere by alternate compression and expansion. In some way, probably by the failure of a joint, the gas in the pipes was suddenly set free just outside the cellar, under the stable where the horses belonging to the brewery were kept. The ammonia-gas, or rather, the vapor of hydrated ammonia into which it is immediately converted on diffusion into a moist atmosphere, has an intensely corrosive action upon animal tissues, and in a few seconds the air of the stable above the broken pipe had dissolved enough of it to act energetically upon the lungs and eyes of the horses tied in the stalls, disorganizing them so rapidly that before they could be removed sixty-six of them were either dead or dying. Even the horses attached to a street car which happened to be passing the building were so powerfully affected by the contaminated atmosphere that they fell to their knees, and were with difficulty roused to drag the car and its passengers out of reach of danger. Fortunately, the day was Sunday, and no human beings were within dangerous proximity of the broken pipe excepting one man, who happened to be standing on the sidewalk near the stable door, and was seen to fall suddenly by some people at a distance, who ran to him and succeeded in dragging him into a purer atmosphere.

A VERY successful experiment in the transmission of force by electricity has lately been carried out at Grenoble, in the mountainous region of southeastern France, by the distinguished electrician M. Marcel Deprez. It seems that there is, about eight miles from the city, a small water-fall, and the municipal authorities, conceiving the idea of bringing this wasted force to be utilized in the town, entrusted M. Deprez with the task, under the supervision of a commission of engineers. The necessary machinery was devised by M. Deprez, and when set in place worked admirably. A water-power of seven horses was taken from the torrent, and transmitted as an electric current to Grenoble, where sixty-two per cent of it was recovered again in the form of motive force, and utilized to drive a saw-mill, a printing-press, and several lathes, besides spending its surplus strength in forcing a jet of water into the air in the form of a fountain. The people of Grenoble, pleased at their participation in the new enterprise, interested themselves deeply in it, and on its successful conclusion made M. Deprez

the lion of the hour, illuminating their houses in his honor, and giving him a public dinner. It seems to us that it only remains for some of our own towns, situated in the neighborhood of water-falls, to invite M. Deprez to cross the Atlantic and lend them his valuable services. With such appliances as his, the longing that has so long possessed the people of Buffalo to get control of the force of Niagara might, it would seem, be in part gratified.

AMONG the papers contained in the recent issue of the *Proceedings* of the Royal Institute of British Architects one of the most interesting is that upon Domestic Buildings in Southern Sweden, by Mr. Alexander Beazeley, a civil engineer who lived for some years in that country. The primitive type of Swedish dwellings seems from Mr. Beazeley's account to be found in the "bad-stofva," or "bath-house," of which many examples remain in the remote country districts. The "bad-stofva" consists simply of a log hut, precisely similar in construction to those so common in our own country, but lower than is usual with us, and roofed, with poles instead of shingles, resting against a ridge-piece, and covered with birch bark, and this again with thatch or turf. The house is always set with one gable facing southward, and the doorway is placed here, the roof being extended to form a deep porch over it, supported by posts and an open timber gable. Inside the "bath-house" is a fireplace, consisting of a shallow pit near the middle of the earth floor, lined with stones, and furnished at one side with a slab of granite, on which is, or rather was, placed the bread intended to be baked by the heat of the fire kindled in the pit. There is no chimney in the structure, the smoke from the fire escaping through a hole made for the purpose in the top of the roof. This smoke-hole forms also the principal window, but small loopholes between the logs furnish additional light and air in various places. The stone baking-slab, in addition to its legitimate use, has from time immemorial served also as a most convenient appliance for the administration of a vapor bath, the bather having nothing more to do than to place himself comfortably upon it, and throw pailfuls of water upon the hot embers and stone linings of the fire-pit below. It is due to the refined civilization of the modern Swedes to acknowledge that the cooking and bathing are now as a rule separately accommodated, but the name of the "bad-stofva" still recalls the use to which the room was put as late as the last generation.

THE next advance in the art of domestic architecture in Sweden appears to have been the development of the "bad-stofva" into the "lag-stofva," or "low house," constructed in the same way as the earlier dwellings, but more luxuriously planned. The open porch of the primitive examples is now converted into a closed vestibule, and the room which forms the remainder of the dwelling is much more elaborately furnished than before. In particular, the ancient ash-pit, although still retained, forms now only the hearth of an enormous open stove, built of granite set in clay, and plastered outside with clay, the top forming a dome, elongated into a chimney, which projects through the hole in the roof used formerly as the smoke-vent, and is provided with a damper like those sometimes employed for steam chimneys, consisting of a cover of boards or a flat stone attached to the end of a lever, and shutting down over the top of the chimney. At one side of the fire opening is the oven, exactly resembling that used in our own grandfathers' houses, and covered with a flat top, which serves for drying corn, and formed also, in the good old days, the customary sleeping-place for the beggars who might honor the house with their company. Opposite the fireplace is the principal window, formed in the roof, like a skylight, but low down beside the eaves, and glazed, even within very recent times, with animal membranes, or with very thin slips of wood, plaited together. Under the window, and generally about this portion of the room, are benches, which in former times served as seats or tables by day, and as couches by night. The more remote end of the room anciently formed the state apartment of the mansion, and was separated from the rest by a bench set transversely. The august enclosure thus formed contained a "högbord" or high dining-table, which served both for banquets when distinguished company was entertained, and as a couch for the distinguished company when the festivities were over, and at one end of the high table stood the still more dignified piece of furniture known as the "hög-säte," or high seat, consisting of a bench covered with a canopy, supported on wooden posts. The "hög-säte" was reserved exclusively for the lord and lady of the mansion, who occupied it by night as well as by day.

THE "lag-stofva" is still found throughout the rural districts of Sweden, but additional apartments in accordance with modern ideas are generally attached to it. One of the earliest additions of this kind seems to have been the "loft," a two-story structure, evidently intended for defence, and consisting of a ground floor, opening only into the interior of the main house, and used as a store-room, and a projecting upper story, accessible sometimes from the inside, and sometimes only from the outside, by means of a trap door in the projecting portion, and a ladder, which could be drawn up on the approach of danger. This upper story of the loft was generally divided into two or more rooms, one of which was occupied as a bedroom by the young ladies of the household, who could not be accommodated on the dining-table or on top of the stove, while the others served sometimes for storage of valuables, and sometimes for the reception of specially welcome guests. In general, the loft was so placed as to defend, in case of need, the main doorway of the house, and a part of the projection of the upper story was utilized, as it is in the Swiss châlets to this day, as an open balcony, where the occupants could take the air without fear in case of siege. In more recent times many alterations have been made in the arrangement both of the "low house" and the loft, to fit them for modern habits of life. Windows have been added in various places, additional doors provided, and a whole group of two-story structures has in some cases taken the place of the single domestic fortification, but through all these changes the type of the long, low living-room, with the other buildings as appendages to it, rather than superior portions of the structure, has persisted with little variation.

THE editor of the *Builder* gives in a recent number a very interesting description of some personal experiences of earthquakes, in illustration of the discussion which has taken place with regard to the catastrophe at Ischia. The most important event of the kind at which the writer had assisted was that of 1858, which killed thirty thousand people in a single province of Southern Italy. Happening at the time to be in Naples, on the border of the shaken region, he observed, about nine o'clock in the evening, a sudden movement of the room in which he was seated, so violent as to swing the large chandelier, which hung from the ceiling, through an arc of more than ninety degrees. The motion continued for some minutes, the room shaking like the cabin of a ship at sea, and similar shocks followed each other at intervals through the night. The whole population of the city rushed from the houses into the street, to stay there until morning, the richer classes sleeping in their carriages, but the next day? when the earthquake was over, and the panic had abated, it was found that only one stone in the city had been shaken from its place, although the power of the subterranean convulsion had been so great as to raise permanently the whole shore of the bay, twelve miles long, about eight inches. The English architect naturally took upon himself to study the construction of buildings which could resist such shocks, and discovered that the walls of the lower story of the house in which he had himself felt them were seventeen feet thick, and that walls of less than three or four feet in thickness were quite exceptional, and if more than fifty years old were generally cracked and seamed by previous earthquakes. Another circumstance to which much of the enduring quality of the masonry seemed to be due was the excellence of the mortar, which in Naples, as generally in Southern Italy, far surpasses in tenacity that used in other countries. The method of making this superior mortar deserves to be widely known, as there is no doubt of its value. The first thought of the Neapolitan mason is to give the longest possible time for the slaking of the lime to be used in his building, and with this end, before any other work is done, a pit is dug close by the proposed structure, into which lime enough for the whole building is thrown, and covered with water. The lime slakes and swells, forming a stiff paste, the top of which is moistened occasionally, to prevent it from drying hard, and portions of the paste are dug out from time to time as wanted for mixing with the sand for mortar. In this way the slow secondary slaking of the lime, which adds so much to the smoothness and tenacity, often goes on without interruption for one or two years before it is made into mortar.

THE GABBERT SCAFFOLD AND SCOTCH CRANE.

THIS very efficient appliance is being more generally used in the large cities of England, and in the north of Ireland as well as in Scotland, and, as a correspondent in Washington has asked for an "explanation" of this combination, and a "drawing showing the construction of the Gabbert scaffold described under the head of 'Builders' Scaffolding,' V," we have pleasure in supplying the following additional particulars which we think will satisfy his requirements. We therefore refer the reader to page 171, No. 354, (October 7, 1882,) for the general description of the Gabbert scaffold, which we may here briefly say consists essentially of a triangular arrangement of three groups of braced piers, each of four upright posts braced together lattice-wise in successive stages. (See Fig. 1.) It will be observed that Figure 1 tallies very nearly with the description there given beginning with line 17, and on to the end of the fifth paper. The latter portion of it, however, describes a simpler form, represented in Figure 2, which is adapted for less heights of staging and compass of derrick. When the staging is high, horizontal rails, at about one-third or one-fourth of its height, measured downward from the top, are bolted to the outside standards of the three pier-like structures called standards, and sometimes "cages,"—binding them all together, each to the other, all around the combination, as shown in Figure 1. The heavy timbers, usually 10, 12, or 14 inches square in section, which connect the three braced piers together at top also support the gangways, or, as is frequently the case, a triangular platform, which is shown in Figure 2, and also in Figure 3. To prevent these timbers from sagging they are supported in the middle by posts or diagonal braces carried up from the above-mentioned rail. (See Fig. 1.) The cross-diagonal or lattice-bracing described in the fifth paper is there shown to occupy the space or, as it were, panel, thus formed, on each vertical side of the semi-cube-shaped combination, triangular on plan, which the three piers or cages assume. The plan of the arrangement of the cages is shown in Figure 3, but A B are to be regarded as in the positions indicated by dotted squares. It is to be observed that frequently the two stay-cages, *i. e.*, piers, immediately underneath the foot of the back-stays of the derrick, are only single braced, alternately in opposite directions in successive upper panels. They may be described as located at the acute-angled corners of the right-angled[1] triangular framework, the *upright* of the derrick being placed over the right or obtuse angled corner, which is in the centre of the circle described by the jib in its rotary movements, also shown in Figure 3, and which immediately supports the upright part or "stock" of the derrick and the foot of the jib. The derrick-crane is an inseparable accompaniment of the Gabbert scaffold, and both are therefore shown together in their normal connection in Figures 1 and 2. They are made for steam-power as well as hand-power and sometimes are both hand-power and steam-power. These derrick-cranes are made travelling as well as stationary — to travel with a load, like the overhead travelling crane. The manner of arranging them on the double tracks is shown in Figure 3;

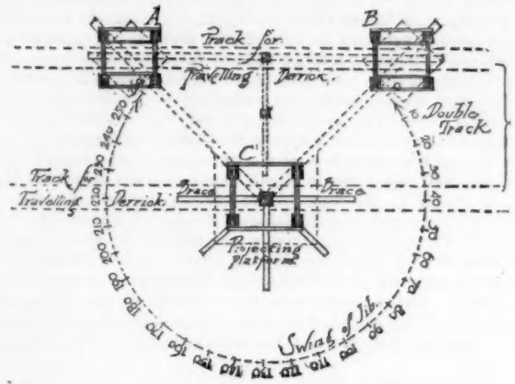


Fig. 3.

wheel-trucks being substituted for braced piers. They are used for facing embankments with masonry, building tidal and other wharf-works, bridge-piers, arches, etc. They are also adapted and used for pile-driving, excavating for cylinder piers under water, etc. The capacity of a derrick-crane for safe lifting ranges from 15 cwt., (112 lbs. = 1 cwt.,) up to 30 tons, (of 2,240 lbs. each,) dead weight, estimated to produce a strain on the derrick chain of a moving load, because of the liability to jerking through the slipping of the chain in coiling and uncoiling round the barrel. The horizontal range of the derrick, when stationary, for carrying and distributing materials is equal to a radius of three-fourths of the length of the jib, and that of the travelling-derrick is limited only by its travelling facilities combined with the radius commanded by the length of its jib. The vertical range of jib may be taken at three-fourths to four-fifths of its length above the staging, — a steam derrick-crane with a radial capacity of 10 feet to 60 feet, double slewing gears, if they are multiplied and conveniently disposed over the area covered by the building, affords facilities for rapid building which our contractors as well as architects would do well to consider. The framework which is laid on top of the cages, instead of carrying mere gangways between the cages, is sometimes planked over to form a large triangular platform, on which tools, tool-houses, tackle, etc., are deposited. (See Fig. 2.) The cages must all rest on heavy timbers bedded firmly on the ground to prevent disturbance. The anchoring is attached to these heavy timbers, which are covered over with heavy planking to receive the building material.

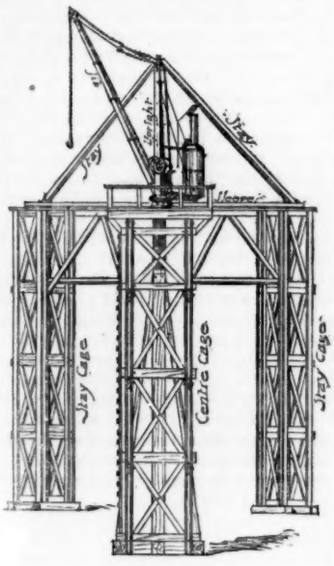


Fig. 1.

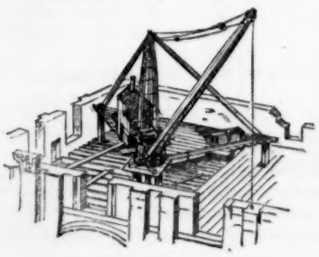


Fig. 2.

The upright is about half the length of the jib, frequently varying to only three-sevenths; the sleepers are each about the same length as the upright. The jib is a simple spar or (square) timber up to fifty or sixty feet long, greater lengths are usually of a pair of timbers bolted and bound together at a gradually increasing distance apart; at the foot it is the same width as the upright, and braced and stayed (see Fig. 2); it is also dotted in Figure 4. The hoisting tackle has single or double purchases. The upright is composed of two timbers (see Fig. 4), say, two to three feet apart, according to capacity, at foot and at the same distance apart for the lower one-third of its length; the upper two-thirds being gradually curved together towards the top, where they are bound together by a square iron head bolted thereto, which carries two pulley sheaves for the jib and hoisting chains and a heavy iron spindle or pivot which is clasped by the eye-irons bolted to the upper ends of both stays; the upright pieces are held rigidly together by a system of shoulder bolts; the foot of the upright is carried by a strong flanged iron plate firmly bolted thereto, and carrying on one side a heavy compass-hinge joint, a socket being formed in the single part of the joint to foot the jib into. This plate also carries a spindle or pivot underneath, which works in a sole-plate to which the converging ends of the sleepers are bolted; the foot of the stays are bolted to the sleepers by means of strong iron connections of various patterns. The anchor-bolts run through the sleeper and stay where they join, the head resting on large washers; a chain or rod is connected by an eye, and carried down to the weighted plank-frame on the ground. The upright carries at back a conical barrel (see Fig 4), on which is coiled a chain passing over a pulley at the top of the upright to raise or lower the jib by either single or double purchase (single for hand-power, and double purchase for steam-power). The jib gear is so arranged with self-acting pawl and ratchet that it cannot run down accidentally. It also carries at front a cylinder barrel for the hoisting chain (see Fig. 4),

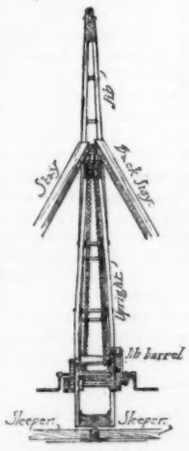


Fig. 4.

[1] The obtuse angle of the triangular frame usually ranges between one-fourth and one-third of a circle, *i. e.*, between 90 degrees and 120 degrees.

which passes over the second pulley at the top of the upright, and thence over a pulley at upper end of jib, and usually runs through a guard fixed to the jib-stay to prevent inconvenient sagging of the chain when unloaded. Spur gearing, in which pinions work, single or double purchase, is fixed to these barrels; winch-handles work the pinions with in-and-out gearing to both barrels (see Fig. 4). This is the arrangement for hand-power derricks. For steam-power the upright is bolted to a large flanged foot-plate which carries the steam cylinders, with their pistons, valve, feed-pump, and crank connections and attachments. An extension of the foot-plate forms a platform for operating, and also carries the boiler (see Fig. 1). The outer end of the platform is braced to the head of the upright so that the weight of the boiler acts as a counterpoise to the loaded jib. A large stiffened sole-plate in which works the foot spindle of the upright is bolted to the frame beams of the staging. On top of the sole-plate a large spur-wheel is bolted, into the teeth of which a pinion, worked by the engine, is geared, which rotates the upright, with jib, load, etc., and is called the slewing gear. In modern derricks the slewing gear is made double action by means of double friction-cones, which revolve and raise or lower the jib whilst the load is suspended without stopping or reversing the engine. The engine is usually double cylinder. A friction-brake controls the lowering of the load.

For the large steam-power derricks, *i. e.*, above the five-ton size, it is not generally recommended or advisable to mount the boiler on the derrick, because of the inconvenience of raising it to the top of a high staging, and as feed-water, fuel, etc., must also be supplied up there, and the stage work must be of correspondingly extra strength, it becomes a question to be decided by local circumstances whether steam cannot be more economically and conveniently supplied from a stationary boiler on the ground, especially if there is one already in use for other purposes. In England mortar-mills, stone saw-mills, rubbing-beds, etc., form part of a contractor's plant, and are often worked on the premises by steam-power supplied from a stationary or semi-portable boiler; in such cases the derrick is often supplied from the same source.

As in every other mechanical appliance skill and care are requisite in its manufacture, erection and working to prevent accidents, but the crane derrick mounted on the Gabbert scaffold is not more fruitful of accidents than the usual appliances employed by our own contractors. In point of economy of time and money I think it will compare favorably in large jobs. The operator of a large steam-derrick crane requires to be a skilled, cool-headed, quick and steady man; none other ought to be allowed to have charge of one. In large works a small boy is kept to call out directions to the operator as to lifting and depositing materials when his own view is obstructed by advancing walls, etc.

The following are usual sizes, and their approximate weights for hand and steam power, respectively, in tons of 2,240 pounds, lifting power: —

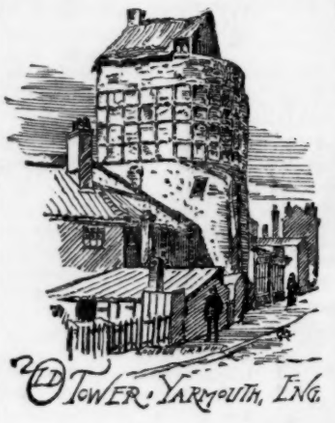
Lifts,	1 ton (size),	2 tons,	3 tons,	5 tons,	10 tons (size-power).
Hand-power,	1½ ton weight,	2¼ "	3½ "	5 "	9 " weight.
Steam-power,	4 tons weight,	5 "	6½ "	10 "	16 " weight.

The makers of derrick-cranes have nothing to do with the design or construction of Gabbert scaffold; each building contractor has his own ideas and system of arranging the proportions of breadth to height of composite standards, etc., and which seem to depend very much upon the magnitude or class of jobs which each usually undertakes, as there would naturally be a disposition to avoid building fresh Gabberts specially adapted for each job, but rather to adapt the same standards, etc., for high buildings that had been previously adapted and used for lower buildings by merely adding one or more panels to the height of the old composite standard.

A common width of base is six feet square for the back-stay standards for nearly all classes of jobs, except public buildings, etc., while for smaller buildings the centre standard *C* is six to eight feet square, and for large jobs it is ten, twelve feet or more square. The cages are divided into panels vertically, in such proportion to its breadth that the angle which the diagonal makes with the vertical shall be 30°, whereby the height of panel is twice its width.

The Border Land of Antiquity. — A Yankee visitor to England had, on the outer passage, played poker till, on arriving in the Mersey, he found himself, after many vicissitudes, the winner of eight pounds. After the manner in which equally pious men of old used to build a church or endow a shrine after a prolonged bout of wickedness, our young friend, finding in an old furniture shop in Durham a piece of carved wood certified by the second-hand furniture man to have formerly been a part of the altar of the cathedral, bought it with the intent to present to his parish church. When others ruefully counted up the cost of facing the Customs officials with their importations the reformed poker player complacently eyed the case containing his altar-piece. "That's real sixteenth-century work," he said. "It goes through as an antiquity, duty free." I met him in the Customs shed two hours later. "What's the matter?" I asked, noticing his flushed face and angry mien; "has the antiquity come out broken?" "Antiquity be darned," he answered, with a painful profanity. "'Twenty dollars duty,' says the fellow to me when I showed him the invoice. 'Sixteenth-century work,' says I, 'goes through as an antiquity.' 'You bet it don't,' says he. 'Antiquities don't begin till fourteenth century. Twenty dollars duty, but you can pay under protest.' So I had to pay for a mean matter of two centuries. If I'd only known the regulation I guess that altar would have been made two centuries earlier." — *The British Architect.*

THE FIRE RISKS OF ELECTRIC LIGHTING.[1]



THERE is a great difference between the electric currents which have been in constant use for telegraphic purposes, and those which are to be supplied by the undertakers under the Electric Lighting Act. The latter can only be said to be free from danger when the heat generated by the current is utilized in its right place, and not developed in the conductors or wires which lead the electricity to the incandescent lamps.

The Fire Risk Committee have already issued rules for the guidance of users of electric light; these can hardly be said to embrace all the salient points of the new subject, which can only be arrived at after years of practical work. The necessity of proper regulations has already been recognized by the insurance offices, both in the United States and Germany, and some of their special rules are given in this paper.

The conductors must be properly proportioned for the current they have to carry; whatever resistance there is in the conductor will cause a corresponding development of heat, which will vary with the amount of electricity passing, and inversely as the sectional area.

The material must be free from impurity, otherwise an impure section will increase the resistance. The extraordinary difference in the conducting power of a sample of "commercial" Rio Tinto copper-wire, as compared with the pure metal, was shown in an experiment by Dr. Matthiessen — the conducting power being only 13.6 as against 99.95 for pure copper.

The continued heating of an impure metallic conductor has a certain effect on its electrical resistance. With the sample just mentioned, the conducting power at 100° C., decreased from 13.58 to 13.558 after the wire had been heated for three days. It does not always follow that there will be a decrease in the conducting power, as, with alloys, the opposite effect is produced. A copper-silver alloy showed an increase of .264, after having been heated to 100° C. for three days, and a tin-copper alloy an increase of .13.

As the temperature in Dr. Matthiessen's experiments was not increased over 100° C, the author has made some further experiments — heating the wires by the electric current from a secondary battery, to within a few degrees of their melting point.

The following materials were tried — the wires and foils having such sectional area, and so arranged that, on the current being increased by twenty per cent, they were immediately fused.

The total length of each experiment was twenty-four hours, during which time the current passing through varied slightly, and the following is a mean of the results: —

Material.	Resistance before heating.	Resistance of leads.	Difference after 24 hours.
	Ohms.	Ohms.	
No. 1. Commercial tin wire	.815	.8	— .003
" 2. Lead, soft	.835	.8	— .005
" 3. Copper, soft	.81	.8	No change
" 4. Pure tinfoil	.86	.8	No change
" 5. Tin and lead alloy	.87	.8	— .160
" 6. Albo alloy in foil	.835	.8	No change
" 7. Aluminium and tin alloy	.82	.8	+ .0008

The resistances were in all cases taken at the temperature of the air, which averaged 69°.

The sign — shows that the metal decreased in resistance, and + that it increased after continued heating. Nos. 1 and 3, tin and copper, were found to scale when heated.

A change has been noticed where high-tension currents have been sent through a pure copper wire for some time—the wire in the armature of a Siemens machine, which came under the notice of the author, appeared to be brittle, and gave a fracture unlike pure copper.

The necessity of good electrical connections is very great; also special arrangements of switches and contact-breakers which, when left in unskilled hands, are liable to cause dangerous heating of an arc.

Short circuit is the danger which may be caused by badly arranged wires; most likely a conflagration will ensue unless the remedy suggested by the Fire Risk Committee and the Board of Trade is adopted — of having a cut-out or fusible plug in the circuit, which gives way when the current is in excess. These should be arranged to melt if the current is more than ten or fifteen per cent of the working strength, otherwise absolute safety is not arrived at. Ordinary

[1] Abstract of a paper by Killingworth Hedges, read before Section G of the British Association, at Southport, and published in the *Journal of the Society of Arts.*

lead or tin wire cannot be used except for very small currents, as, on fusing, the metal is scattered in a globular form, when it is liable to cause fire. The plan adopted by the author is to take pieces of foil arranged like the leaves of a book; the thinness of the foil causes it to be almost volatilized when melted. The material found to be the most reliable is a special alloy of aluminium, termed Albo metal, which is extremely tough, and can be worked much nearer to its fusing point than tin or lead.

The safety of an electric light installation is only insured by testing, which should be done by a current of higher electro-motive force than it is intended to use.

When the work has been properly supervised no trouble should be experienced, and the electric light may be said to be much safer than gas, as it is free from those accidents which are due to a servant's carelessness, or to leakage of the pipes. Whatever danger there is with electric lighting is entirely localized to the generating station, where the dynamos and engines would be under constant supervision.

LECTURES ON ARCHITECTURE.[1] — V.

WE have seen that from the earliest Egyptian architecture down to the Gothic, a chain of successive transitions may easily be defined. Each style was a modification of the one which preceded it, and not a new and foreign importation from a totally different soil. The altar stones of the Druids, and the caves of the early priests passed into the sombre temples of Egypt; the Egyptian style passed into the Grecian, the Grecian into the Roman, the Roman into the Romanesque and Lombardic, and these again, with the Saxon and Norman, passed into the forms upon which arose the idea of the pointed arch. From this practical study of facts we are soon led to the principles which they contain.

As the horizontal line is the characteristic germ of the fundamental principle of the Grecian style of architecture, so is the vertical line of the Gothic or pointed style. The full application of these two principles has been satisfactorily traced out by learned writers. As figure or form is the principal business of architecture, and as figures themselves, however various, must be resolvable into lines, it will be found that an analysis of these elementary lines will supply us with a key to the leading ideas in the origin of the differences in all the various styles. They may, then, be reduced into five: two curves, one of them convex, and the other concave; and three straight lines, one of them horizontal, the other perpendicular, and the third oblique. No other simple elementary line can be found beyond these, and it can be shown that in each of these is contained the leading principle of a peculiar style of architecture. Five styles may be enumerated as remarkably distinguished from each other in their characteristic forms; the Saracenic, the Chinese, the Egyptian, the Greek, and the Gothic. There is none, perhaps, that is not a corruption or combination of some one or more of these lines; and if it could be shown that peculiar circumstances in the history and association of each people and period in which these styles were introduced, had directed their attention to particular lines as symbolical of particular ideas, or as the natural expression of certain feelings; if it could be shown that other circumstances had led to the connection of them with certain figures, so that it should be natural for them to develop themselves in certain forms rather than others, we have then gained some steps toward the formation of a true philosophical theory in the science and the taste of architecture.

It will be necessary to enter somewhat into this field of inquiry at this stage of our progress, in order to explain with clearness the predominating principle of the Gothic style.

The abstruseness and nicety of the question might at first sight be thought a sufficient reason for declining to go into it very deeply; but as any extended consideration of the art would be incomplete without it, I am compelled to ask your close attention to the development and application of this great elementary idea. I have only adverted to it incidentally in the previous lectures, because the present seemed to be the most suitable place to bring it forward; but you will readily perceive that I have still kept it constantly in view, so far as it was possible to adhere to it, without a distinct statement of it in an explicit and detailed form.

In the drawings of Chinese buildings, and those of other nations of eastern Asia, it is easy to recognize the constant recurrence of one of these lines, the *concave*, which is rarely, if at all, to be found in any other style. In the roofs of these buildings, which, as involving the principal utility of them, are the most prominent and important part, and therefore give the leading character to the rest of the slight structure, this line in its double form ⌒ is of constant and almost universal use. Every one will recollect that its figure is invariably introduced in the strange and uncouth representations of Chinese buildings upon the earthern wares with which we are familiarized from childhood. In this first instance, indeed, it is to be feared that the slightness of our acquaintance with Chinese habits of thought and history, and still more, our ignorance of those secret and mysterious analogies which make lines, and figures, and color, and in fact, material objects generally, real and designed representatives of moral and intellectual impressions, would render it difficult to account with certainty for their adoption of this elementary line; but the fact of its universal prevalence is, at least, unquestionable. Mr. Hope, one of the most learned and ingenious writers on architecture that the world has ever produced, traces its adoption with much probability to a rigid imitation of the form of a tent. From the universal propensity of all nations to retrace in their later method of construction the forms of the earlier materials in use among them, "we shall see," says he, "that the structures of the Chinese still resemble in all their parts those of the tent, their original type. In the wooden pillars, destitute of bases and capitals, which support the ceiling in such numbers, we see the poles; in the concave roofs which project from these pillars with their ribs and divisions, we see the awning of hides or pliant stuffs spread over ropes and bamboos; the curling spikes that fringe their eaves represent the hooks and fastenings; and in the lowness and spreading arrangement of the different parts we have the whole form and appearance and character belonging to the residences of the herdsmen who were the ancestors of their builders. The Chinese houses seem to cling to posts, which, when planted in the ground have struck out and become fixed there. The palaces themselves look only like a number of collected awnings; and the very pagodas or towers in their loftiness are nothing more than a number of tents piled on top, instead of standing by the side of, one another. The aggregate dwellings from the smallest village to imperial Pekin itself, in their distribution resemble nothing but a camp, and when the English ambassador, Lord McCartney, after crossing the whole of the Chinese empire from south to north, from Canton to the Great Wall, in its farthest length, was received at last on the borders of Tartary by the emperor in a *real* tent, he scarcely perceived any difference to exist between it and the millions of permanent buildings he had viewed in the course of his journey." The same idea predominates throughout the whole, and there seems indeed to be no little interest in the theory which would thus trace in Chinese architecture the intelligible meaning which ought of right to belong to so peculiar a style. We may confidently suppose it to be a part of that rigid and undeviating adherence to ancient notions on which the stability of their empire is evidently made to rest. In this way Chinese architecture becomes the expression of the leading sentiment in the character of the people among whom it came into birth.

If we next turn to the Saracenic or Moorish style, we find (and for the same reason, in the same part of the building) that the *convex* line is here equally predominant. A Turkish mosque is a little forest of domes; the slender minarets swell out into bulbs; the arches bend into the form of the horse-shoe, and though among the Arabs as well as among the Christians, the introduction of the angle into the curve of the arch was suggested and almost forced upon them, it never seems to have taken root, as it were, or to have developed itself in those remarkable results which ended in the production of a pure Gothic architecture. Something was wanting in the habits of thought and feeling among those Eastern nations to render it equally indigenous, and equally productive of a national style. Whether the taste for the concave line among the Saracens, however, flowed from a barbarous imitation of a corrupted Romanesque; from a fondness for the repetition of the crescent, or from association with any astronomical notions, — which is thought to be not improbable, — it is now scarcely worth while to inquire. Moorish architecture, like the Chinese, though in itself sufficiently characteristic has never become systematized, or settled into any distinct and regular theory of style. Its primary line which we have noticed, is one which is evidently incapable of producing variety, or of throwing itself out into general combinations; and we may proceed, therefore, to the three other styles in which the theory here suggested is still more strikingly illustrated.

Of the three straight lines, the horizontal, the perpendicular, and the oblique, the last is the one which was evidently the germ of the Egyptian style, and we now know enough of their institutions, and of the associations to which they gave rise, to account not only for their selection of it, but for its running out so universally into the peculiar figure of Egyptian architecture. This figure, it will be recollected, is that of a truncated cone or triangle; it is distinctly exhibited in the shape of the elevations of their temples, in the form of the doorways, of the columns, and of course of the intercolumns (or spaces between them), in the pyramids, the obelisks, the sphinxes, in everything, in fact, which is peculiarly of Egyptian origin; it shows itself in every outline, and meets us at every turn. The fact of its prevalence, therefore, will not be disputed, however we may differ as to its explanation; and the question before us is to decide what is the connection between this confessedly Egyptian figure and the oblique line which is assumed to be the primary element of all Egyptian architecture.

To prove this connection, then, it must be shown that there was something in the predominant circumstances of Egyptian art, employed as it chiefly was upon religious buildings, which first led to

[1] Extracts from a lecture by the late Mr. Arthur Gilman, delivered before the Lowell Institute, Boston, in the winter of 1844-45. Continued from page 189, No. 408.

the employment of the oblique line as the expression of that something in a visible form. From the use of such a line, the figure of a truncated cone is a natural and obvious suggestion; and it is not difficult to account in the most satisfactory manner for its constant introduction. The whole history of Egypt in its arts, as well as in its politics and religion, exhibits one leading idea impressed on every part, — the idea of unlimited but unvarying progression. It exhibits their society under the pressure of an enormous power of the priesthood, which was not, however, allowed to run into abuse, and to destroy itself by its own excesses; but maintained a firm mastery and direction over the minds of the whole people; knowing no other object of ambition than to preserve its power unincreased or undiminished; content to hand down its stock of hereditary knowledge without thinking of any additions to it, leading on generation after generation in a monotonous undeviating procession of castes and families, guarding them on every side by gigantic social institutions, which were consolidated by time as well as by the sanctions of religion, and bringing up the nation with a steady vigilance over thought, word, and action, in a slow approach to the awful portals of a mysterious eternity, beyond which little was unveiled except to the priesthood themselves; even the arts — sculpture, painting, music — were not exempt from a rigid superintendence, which prohibited all license or variation. And this peculiar cast of thought, derived as it was from their political and religious system and emblematical of its origin, exhibited itself in their religious worship — as we know to be the fact — chiefly in the form of imposing processions. Processions, it has been observed, are the natural expression of a dominant power; and as they move on in a continuous line, the line constantly presented to the eye of Egyptian art, when employed in architecture, was the *oblique* or foreshortened and projected line such as is presented to every one who is advancing from one point to another straight before him. It is natural that this line should suggest an *avenue*, and accordingly the approach to Egyptian temples was made through avenues of obelisks and sphinxes, forming in fact the real temple for the people, as the mysterious halls within the portals of the building to which they led were reserved for the priests and the initiated alone. The perspective of this avenue, it will be perceived, gives us immediately the figure in question. As the oblique is clearly the Egyptian line, what, then, would be the figure suggested by it, but the truncated triangle formed according to the laws of perspective by the two lateral lines of an avenue? converging not to a point, but to the front of a portico at the end of the vista, and harmonizing in every particular with our innate ideas of grandeur, solidity, and immutability. And such being the primary figure, it was repeated on every part in order to preserve this solemn unity and harmony, which it will be admitted, can be rendered perfectly compatible with variety and multiplicity of detail, provided each variation be only a repetition, however modified, of the one original type or figure.

It might, perhaps, be interesting to dwell longer on this mark of the Egyptian style, were it now the principal object of remark; but enough has probably been advanced to give a general illustration of the hypothesis that in this, as in every other consistent style of national architecture, its great peculiarities depend on the adoption of some peculiar figure, on which it works as a base; that this figure was generated or suggested by some peculiar elementary line; and that the adoption of this line depended on peculiar circumstances and habits of thought in the age in which the style originated. This is perhaps the most comprehensive view which it is possible to take of the philosophy of architecture.

From what has been previously said of the Grecian style (which next presents itself to notice) it will be evident that its type is to be found in the *horizontal* line, and its connection must be traced in a similar way. Call to mind the representations of Grecian edifices which have been exhibited here on two former occasions, and you will recollect how vestiges of the Egyptian were still distinguishable in the shape of the Doric columns, the figure of the doorways, and even in the outline of the elevations. Whatever variations of detail might have been introduced — and they certainly were not few or unimportant — the general configurations of Grecian architecture were such as might naturally be expected among a people whose art and wisdom, and much of whose theology, was derived from the distant banks of the Nile. Even the front of the Parthenon does not present a regular parallelogram to the eye, but rather the same form of truncated triangle, though the transition from it is evidently approaching. But the Egyptian avenues were abandoned in Greece; the Athenian temples stand by themselves, not as terminations for lengthened processions, but as insulated objects for the eye of the spectator. Under their more popular form of religion, the people were no longer to be marshalled in solemn processions, under the guidance of an overruling and perhaps a tyrannical priesthood, but to be gathered familiarly under the porticos and colonnades of their temples; and thus, as we have already seen, these became the chief and most prominent feature of Grecian architecture. But these porticos and colonnades were designed for use — for art in those days had not, as in our own, become so meretricious and unmeaning as to calculate for any primary purpose but use — and this use was shelter, and the shelter was provided by the roof which these columns sustained. In the roof, therefore, and in the entablatures on which it rests, were to be found the characteristic features of the new style, just as the line of the Egyptian was found in its most important part, the avenue. This feature was the horizontal line, and, although an eye accustomed, by the peculiarities of Gothic architecture, to search for the picturesque instead of the simply beautiful, would prefer to fix itself at the angle of the Grecian colonnade, and so throw the building into more of the Egyptian form — pillar dwindling behind pillar, and the lines of the base and cornice converging into the truncated cone — such was not the true temple of the original Grecian taste. You will recollect that that style was shown to delight in symmetry, and proportion, and regularity, in measuring relations, in adjusting parts from a common central point, in forming systems over which it placed itself as a critic and spectator, judging everything by the same rule, and referring every object to its own eye. And how clear is it that in all this we may trace the altered form and character of the human mind, after its transition from the oppressive, monotonous region of Egypt to the stimulating atmosphere, the free soil, and the unfettered habits of thought in the Grecian colonies. Their religious worship was turned into a luxury of the imagination and the senses, their traditionary philosophy into schools and sects of scepticism, their government into a conceited democracy, and their morals into licentiousness and self-indulgence and self-will. Thus what may be termed the rationalistic power of the Grecian intellect, stimulated by its conceit, acted on every subject which was brought within the range of the Grecian mind, and its effect upon architecture was to produce a system whose beauties are based upon theorems of geometry, and calculated by the fractional divisions of arithmetic. All its figures are produced by one and the same kind of mental operation, and coincide throughout with the natural tendency of Grecian fancy and feeling.

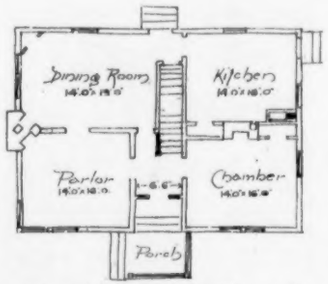
But when the arch was introduced by the Romans and engrafted upon the Grecian column, the seeds of decay were fairly sown in the system of classical architecture. If Rome, says a late writer by whom this theory is admirably supported — if Rome suffered herself to be led captive by Grecian art, she still retained much of her original wildness and uncouthness; she never possessed that quick intuition and that instinctive sensibility to harmony which had characterized the Greeks. She was not only incapable of appreciating the delicacy which shaped the minutest details of Grecian architecture, but in her attempts to grasp the grand and gigantic, she was obliged to combine a number of parts without being able to form them into a perfect unity. A scene of confusion was generated by the intrusion of the arch; this is an inimical feature in the system of horizontal lines. Every fresh curve or circle of which the arch consists requires a new centre to be taken by the eye, and every fresh point thus taken introduces a new movement, and disturbs the leading principle of the classical style. Thus the eye was carried in contrary directions, and a variety of figures were introduced, which were not repetitions or modifications of one primary type, but each of them wholly unconnected with the other.

WHAT THE ARTS COST.

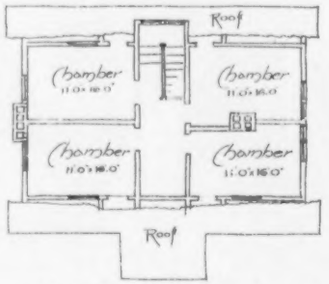
AT this moment, when every one gossips about painting, engraving and sculpture, it may be of interest to inquire into the expenses which an artist is actually compelled to incur in the execution of a picture, a statue or an engraving. Let us begin with the painter as he leaves the Ecole des Beaux-Arts. It is self-evident that he needs a studio. You know that it would be difficult to-day to find one that costs less than six hundred francs yearly. The expenses for furniture, fixtures, etc., need not be high. At a pinch a stand for models at twenty francs, an easel at fourteen francs, a box of colors at fifty francs, brushes to the value of five francs, and a stool for three francs will be sufficient. To these we must add the price of canvases, which, as a matter of course, varies according to size. All this can be managed quite nicely with one hundred and fifty francs.

But from the day the first stroke of the brush is laid the expenses keep on rising, rising. It is a veritable flood-tide. Are you a lunatic, such as Manet was? Then, instead of brushes costing thirty centimes apiece, you will have to use martens at eight francs. To Naples yellow, worth seven sous, you will prefer cadmium at 2.50 francs. Do you like genuine ultramarine? You cannot get it for less than twenty-five francs. Do you paint costumes? Go and buy stuffs! And what are these expenses compared to those caused by the models. An ordinary model asks five francs each sitting. Choice models cost ten and fifteen francs. A well-studied picture usually requires something like sixty sittings. Count it up. If you admit that a painter has a right to eat and be clothed, you will admit that, if he does not paint more than one picture per year, he must sell it for at least 12,000 francs to keep him from starving.

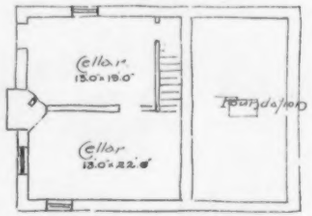
Now as to sculpture. Unfortunate kneaders of mud! For them the expenses of studio, models and costumes are the same as for the painters. Brushes and colors are replaced by a few instruments which cost fifty francs altogether. The modelling stand costs 400 to 500 francs, and as a rule three of them are needed. Clay is sold for fourteen sous the lump; twenty-five lumps will do for an ordinary statue. The work done, the moulder is called in, who begins by



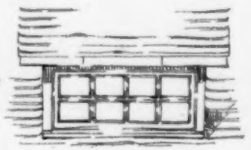
* Plan of First Floor. *



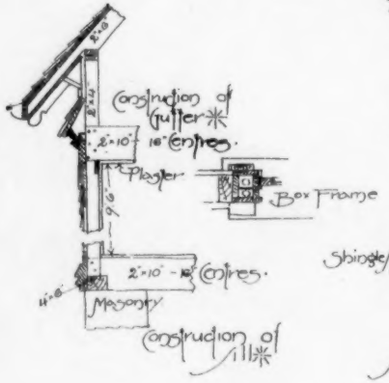
* Plan of Half Story. *

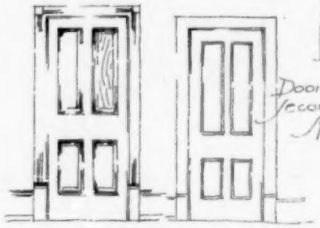


Plan of Foundation



* Dormer Window *





* End Elevation *

"American Architect" Competition for a Design of a Mechanic's House, Submitted by "Thumblack."

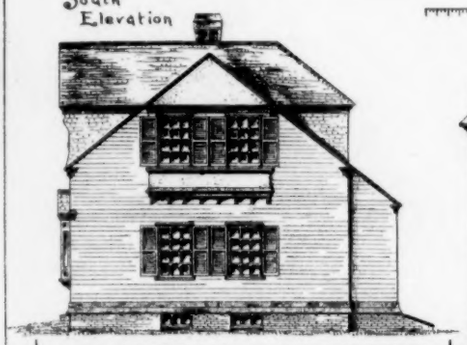
The Heliotype Printing Co. 211 Tremont St. Boston.

The Heliotype Printing Co. 211 Tremont St. Boston.

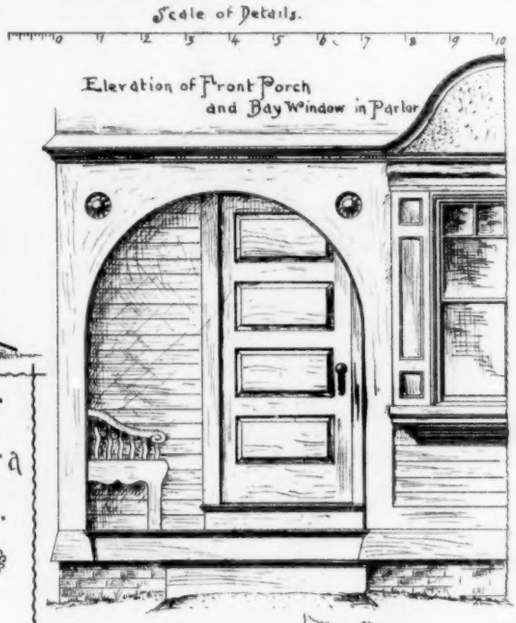
AMERICAN ARCHITECT · COMPETITION · DESIGN for a MECHANIC'S HOUSE · By Engineer.

April 1883.

South Elevation



Scale of Details.

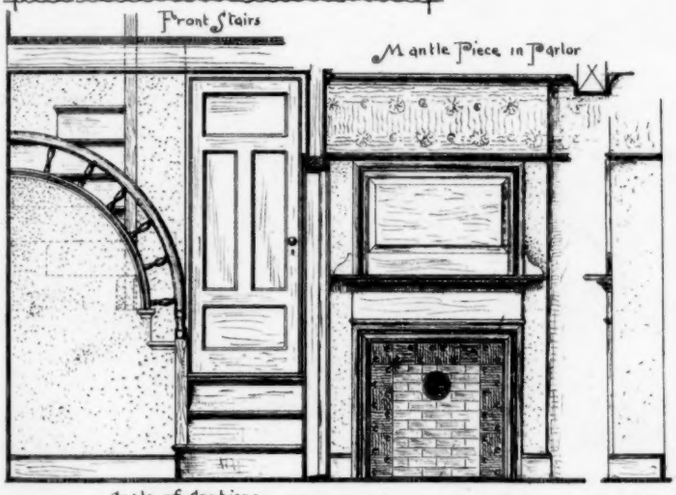


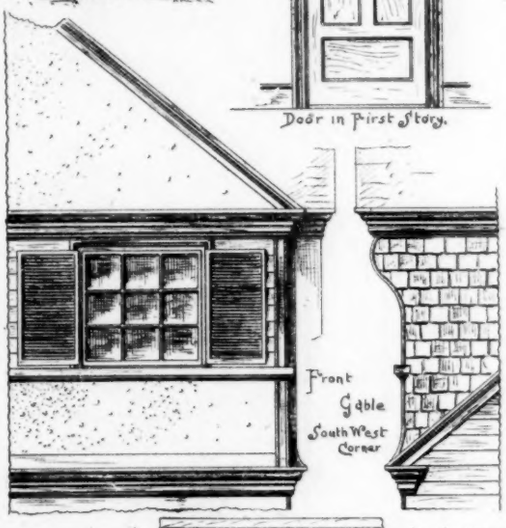
East Elevation.

Door in First Story.

Front Stairs

Mantle Piece in Parlor





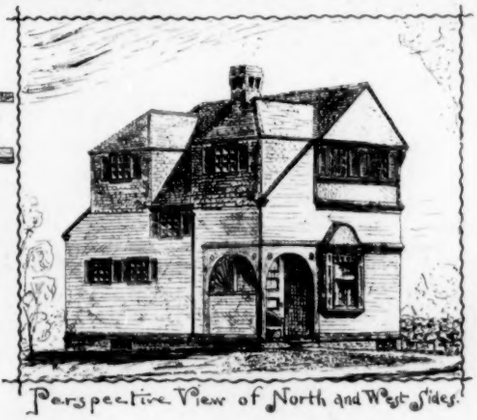
Scale of Sections. 12 ins. 9 6 3 0 1 ft

Architrave of Door

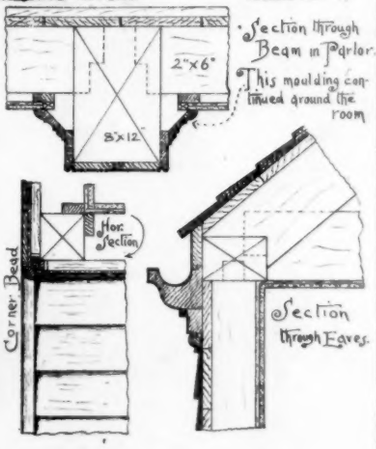
Window Section

Base

Window Stool Inside

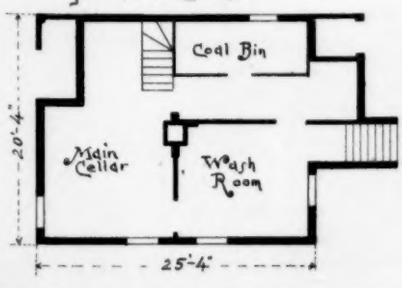


Perspective View of North and West Sides.

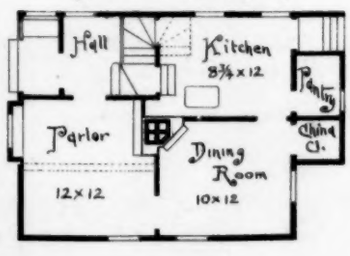


Scale of Plans and Elevations. 0 10 20 30

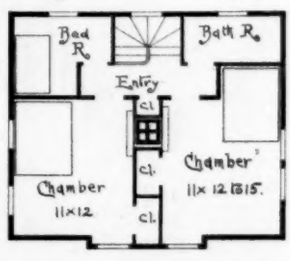
Plan of Cellar.



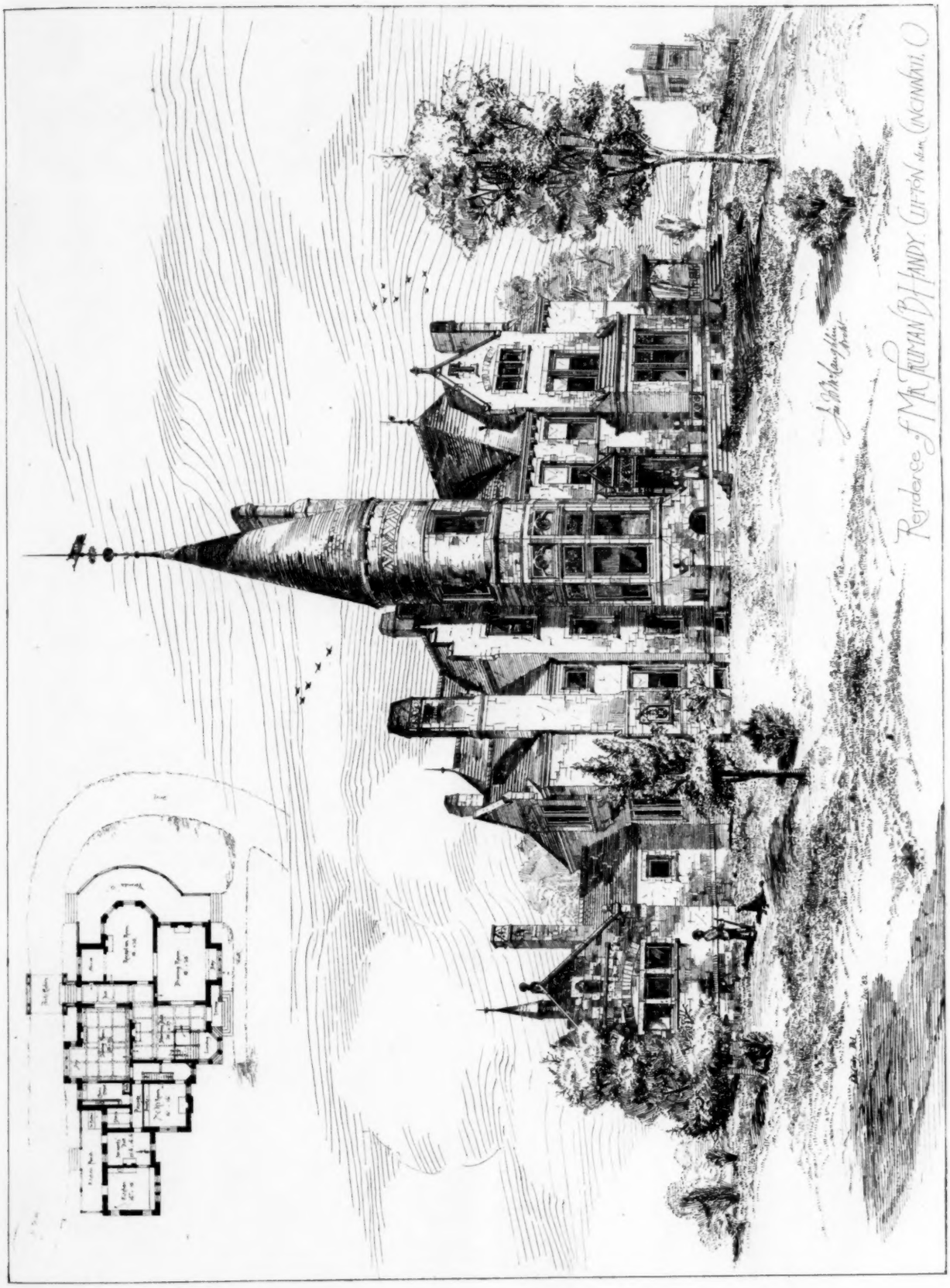
Plan of First Story.



Plan of Second Story.



The Heliotype Printing Co. 211 Tremont St. Boston.

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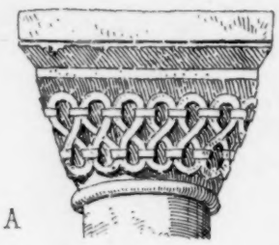
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CAPITALS A A A A A. FROM THE CHURCH OF ST. GEORGE, BOCHERVILLE. NE

FROM DIJON, FRANCE.


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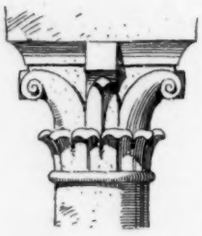
B. B. B. B. B. FROM THE CHURCH, SAINT SAMSON-SUR-RISLE,

FROM PALACE FINOCCHIARA,
AT RANDAZZO, SICILY.



FROM THE CRYPT OF BAYEUX CATHEDRAL, FRANCE.
Moniteur des Architectes.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CAPIT

FROM THE CLOISTER, MOISSAC,
FRANCE

FROM THE CRYPT OF BAYEUX CATHEDRAL, FRANCE.
Moniteur des Architectes.

FROM THE CHURCH OF SAINT GE

JAMES R. OSGOOD & CO

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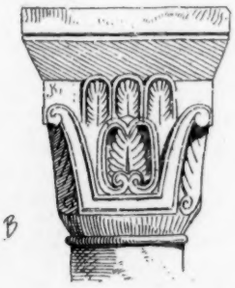
VILLE, NEAR ROUEN, FRANCE. *Monitieur des Architectes.*

FROM THE CHURCH AT CHEZAL BENOIT, FRANCE.



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-RISLE, FRANCE.

FROM THE CATHEDRAL AT SENS, FRANCE

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PITALS.

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Monitieur des Architectes

FROM THE CLOISTER, MOISSAC, FRANCE.

E SAINT GENOU, INDRE, FRANCE.
Revue Générale de l'Architecture

FROM THE ABBEY AT FLAVIGNEY, FRANCE.

RE-DRAWN FOR REPRODUCTION BY D. A. GRIGGS

The Heliotype Printing Co. 211 Tremont St. Boston

asking one hundred and fifty francs. Is it worth the trouble to try to make marble pay? For a statue of a metre forty it will take a block worth 1,200 francs. And so much the worse for the artist if the block develops flaws, and has to be replaced. In that case he will be compelled to pay the expenses occasioned by the improvidence of nature. Then there is the pointer who blocks out the marble in the rough, and the skilled stone-cutter who turns over the statue to the artist all made, with the exception of the beauty of expression. Pointer and skilled workman demand a formidable sum, 2,400 francs. In short, a marble statue of ordinary size costs its author at least 6,000 francs, without his having eaten a morsel! It will be seen that sculpture is a craft for the rich, and the majority of sculptors begin life in poverty. Judge of their struggles, their battles, and—never pay less than 20,000 francs for a statue.

Of all the arts of design, engraving from the point of view in question, is the least onerous. An engraver, if need be, can get along without a studio. You can work admirably at a little table placed before the best window in the room. The tools are relatively cheap. Says Charles Jacque: "Rembrandt would have produced a *chef d'œuvre* with a bit of zinc, and a nail picked up in the street." To-day, for 200 francs, you can find at Lamour's all your heart may desire. Of course, the original engravers need models, but the reproducers can get along with a photograph. How is it, then, that some of the latter, more especially the burinists, are actually forced to ask such high prices for their plates? It is because, beside the talent, time must also be paid for. Bracquemond put more than a year into the engraving of "Labor." Champollion asked two years for the execution of "The Chase of St. Hubert" after Baudry. Robert sank five years in the engraving of the new bank note.—*L'Estampe.*

THE ILLUSTRATIONS.

A COLLECTION OF CAPITALS, MAINLY BYZANTINE.

INTERIOR OF ST. PETER'S CHURCH, ALBANY, N. Y. MR. R. M. UPJOHN, ARCHITECT, NEW YORK, N. Y.

COMPETITIVE DESIGNS FOR A MECHANIC'S $1,500 COTTAGE SUBMITTED BY "*Engineer*" AND "*Thumb-Tack.*"

FOR a description of these cottages see the following article.

"'*ENGINEER.*' Plan too small. Although it may suit the sum to be expended, a family would be very uncomfortable in such small rooms. The outside too complicated. Drawings carefully made, but lacking in artistic touch or feeling." — *Extract from Jury's Report.*

The design submitted by "*Thumb-Tack*" was received so late that the jury had already made their award, and therefore this design was not submitted to their consideration.

HOUSE FOR TRUMAN B. HANDY, ESQ., CLIFTON, O. MR. J. W. McLAUGHLIN, ARCHITECT, CINCINNATI, O.

THE COMPETITION FOR A MECHANIC'S HOUSE. — VI.

DESIGN SUBMITTED BY "*Thumb-Tack.*"

EXCAVATION: — Excavate for cellar 7′ in the clear. The portion of plan marked "foundation" to be excavated only 4′ for foundation walls. Excavate also for cistern of fifty-barrel capacity.

Foundations: — Build all stone-work of native sandstone, quarry-faced, laid in good lime-mortar. All walls shall be 18″ thick, neatly pointed above grade with cement-mortar. All jambs neatly tool-dressed.

Brickwork: — Build chimneys of good sound brick with 8″ x 8″ flues and neatly pargeted; flues shall have a soot-pocket, 18″ deep, and holes fitted with No. 7 crockery collar. All exterior work in chimneys to be laid of sound face-brick with neatly pointed joints. All fireplaces shall have trimmer-arches and be furnished with hearth of freestone.

Carpenter Work: — Studs, rafters and joist to be hemlock. All finish to be white-pine, second common. All flooring to be white-pine.

Joists: — All floor joist shall be 2″ x 10,″ 16 ″on centres, cross-bridged every 7′.

Studs: — All studding to be 2″ x 4,″ 16″ on centres, to rest on a plate in all cases and be well stiffened with cross-blocking. Plate for rafters shall be doubled 2″ x 4,″ laid with broken joints and securely spiked together. Sill to be 4″ x 6,″ laid in mortar.

Rafters: — Rafters to be 2″ x 6,″ 16″ on centres, with collar-beam 8′ from floor, and all rafters to be securely nailed to both ridge-pole and plate.

Sheathing: — Roof and gable-ends to be sheathed with hemlock, second common, boarding.

Flooring: — All flooring to be second common white-pine. Floors in cellar to be 4″ concrete, laid on a bed of cracked stone, drained by 4″ pipe. Porch floor to be laid with white lead joints.

Shingles: — All shingles shall be 16″ cypress, well nailed and laid with 4½″ to the weather. All exposed joints to be flashed with tin, painted on the under side.

Weather-Boarding: — Sides of house to be covered with clear second common weather-boarding of 6″ widths, laid with a lap of 2″.

Outside Casing: — All window casings and corner boards to be 2″ x 4″ white-pine, clear of knots, etc.

Window-frames: — To be box window-frames on first floor; all others to be common frames. Dormer windows to be hinged at top and furnished with all suitable furniture. Box-windows to have cast-iron axle-pulleys and linen sash-cord, with iron weights, plain black cast-iron sash-locks and lifts. All sash to be 1⅜″ thick.

Doors: — Doors to be 1⅜″ thick, hung on plain pin butt-hinges and have two-tumbler-locks and keys. Front door to have three-tumbler-lock with white knobs and trimmings; all other doors to have colored mineral knobs and black trimmings.

Wainscot to be of upright tongued-and-grooved boards of 3″ widths in front vestibule, with cap rail and base.

Stairs: — Stairs from first to second story to be a box-stairway, risers and treads of ⅞″ white-pine; newel-post, 4″ x 6,″ as shown, and rail with plain square balusters, three to a step. Flight from cellar to first floor to be plain mill steps with carriage of 3″ x 12″ hemlock, with steps gained in at the ends.

Mantels: — There will be three mantels, the cost of which shall not exceed $50.

All inside finish to be of white-pine of thoroughly dry and clear qualities; 10″ base in all rooms in first story, and an 8″ base in upper rooms.

Hardware: — The hardware throughout the house shall be plain black japanned. Closet doors to have spring-catches instead of locks. Windows to be furnished with suitable stays for holding open and locks for sashes. Axle pulleys, cords and weights. To be a sufficient number of cast-iron clothes-hooks in all closets in chambers.

Plastering: — All walls, ceilings and soffits of stairway in first and half story shall be plastered with good three-coat work, with hard white finish. The floors of rooms in cellar shall be of concrete 4″ thick made of cement and coarse sand and gravel.

Conductors: — To be four 3″ conductors with patent cut-off attached. Gutters to be of galvanized-iron as shown. Drains will connect with cistern.

Painting: — All exterior wood-work excepting shingles to have three good coats of white lead and oil. The shingle-work to have two coats of Venetian red.

Glazing: — All glass to be Pittsburgh double strength. Interior wood-work to have three good coats of paint in such tints as may be desired.

Pump: — To be one pump in kitchen connected with cistern. The sink to be lined with zinc and have a waste-pipe.

Privy: — Build a privy over a vault of 5′ diameter; privy to be 6′ square, with cedar sills.

Cistern: — Build a cistern of 50-barrel capacity. Bottom to be an inverted arch; bottom and sides to be a 9″ wall. Inside of cistern to be cemented up to the springing line of crown arch and finished with a brush.

ESTIMATE OF QUANTITIES AND PRICES RULING AT ALLEGHENY CITY, PA.

60 cubic yards of excavation	$ 21.00
50 perch of stone	120.00
8000 brick	45.00
65 sq. yds. of concrete	16.25
50 ft. of drain	17.00
Cistern	30.00
Privy	10.00
1500 ft. joist lineal	90.00
4800 ft. studs, 2″ x 4″ lineal	96.00
3300 ft. weather-boarding, lineal	100.00
60 rafters, 2″ x 6″ x 20′	30.00
Stairs	25.00
Architraves and bases	50.00
Mantles	50.00
14400 shingles	60.00
2320 ft. flooring	104.40
Windows, doors and frames	95.00
Gutters and conductors	12.00
Hardware	15.00
Painting and glazing	85.00
600 yards plastering	75.00
Pump	12.00
Sheathing	14.00
Labor and profits 25%	293.16
Architect's commission 6%	87.94
Total	$1,553.75

DESIGN SUBMITTED BY "*Engineer.*"

It is intended to place this house on a narrow lot (say 50′ wide), facing west. The cellar will be 6′ 6″ high in the clear, but the north wall will be only 4′ deep (below the surface), the cellar bottom being sloped up against it in the coal-bins.

The house is to have a balloon frame, and is to be finished in pine or cypress; spruce clapboards; sawed cedar shingles, unpainted.

Interior shellacked. Parlor, hall, and dining-room, natural color of the wood; other rooms stained red.

First and second stories 8′ 4″ high in the clear; second-story rooms are all full height throughout; no attic.

Bath-room not fitted up at present.

Gables plastered (Portland cement) and stuck with colored glass.

Stair-rail, ash.

ESTIMATE OF QUANTITIES AND PRICES RULING NEAR BOSTON, MASS.

Excavation, 4 ft. deep	$ 20.00
25 perches dry stone wall, @ $3	75.00
Brickwork	108.00
4000 ft. framing-timber, @ $16	64.00
35 M ft. boards, @ $14	49.00
10 M. shingles, @ $4.25	42.50
800 clapboards, @ 55 c.	44.00
Outside finish, gutters, etc.	85.00
16 window-frames	24.00
Windows and blinds	35.00
Cellar windows and frames	6.00
Plastering gables	10.00
Doors and door-jambs	70.00
Stairs	45.00
Plastering	100.00
Inside finish and mantels	130.00
Concreting cellar	22.00
Plumbing (in kitchen only)	50.00

Painting, three coats (except shingles)	$10[illegible].00
Hardware and nails	57.00
Labor	350.00
Contractor's profit	150.00
Architect's commission	75.00
Total	$1,711.50

The above estimate was furnished by Kelly & McKinnon, Carpenters and Builders, 7 Western Avenue, Cambridgeport, Mass.

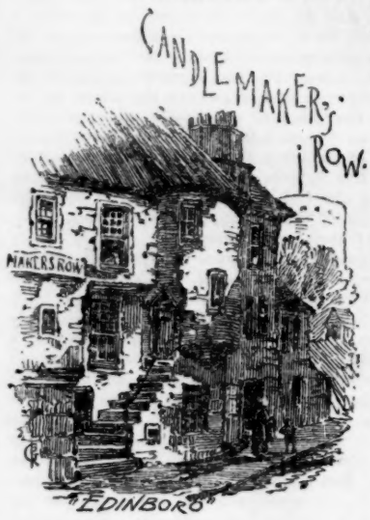
TILE-MAKING IN HOLLAND.

THE tiles manufactured in Holland are flat, hollow, S-shaped, or with a square opening in the middle to let in a pane of glass, being much used for lighting lofts and garrets all over the Low Countries. They are either red, gray or blue, or glazed on one side only. The flat paving-tiles are about eight and one-half inches square by one inch thick; they are used principally for cisterns and for bakers' ovens. The clay for tiles, it is to be noted, is in all cases more carefully prepared than that for bricks, being ground up wet in a pug-mill, or tub, with a shaft carrying half a dozen blades. By this means roots, grass, etc., are got rid of. The clay comes out of the pug-mill of the consistence of potter's clay, and is kept under a shed, where it is kneaded by women, with their hands, to the rough form of a tile, on a table dusted with sand. These pieces are carried off to the moulders, who are two in number, a rough moulder and a finisher. The tiles are then dried under sheds, and afterwards in the sun. With regard to the flat paving-tiles, they are at first rough-moulded about an inch larger than the subsequent size, and a little thicker, and then laid out to dry under a shed, until such time as the thumb can hardly make an impression on them. They are then taken to a finishing-moulder, who, on a table quite level and slightly dusted with sand, lays one of the tiles, and strikes it twice or thrice with a rammer of wood larger than the tile, so as to compress it. He then takes a mould of wood, strengthened with iron and with iron cutting edges, and puts it on the tile, which he cuts to the size. The mould is of course wetted each time it is used. The tiles are then regularly dried. In Switzerland and Alsace an iron mould is used.

The tile kiln is generally within a building, and about sixteen feet long (in ordinary dimensions), ten feet wide, and ten feet high. The walls are from four and one-half feet to five feet thick, secured outside with great beams, and so secured together as to form a square frame. Some of the largest of them are pierced with four flue-holes, as in brick kilns; but the flues are formed by a series of brick arches about two and one-half feet wide by sixteen inches high. The opening of the flue-hole is about ten inches by eight or nine inches high. On their upper surface, these series of arches form a kind of grating, on which the tiles are laid. The kiln is covered in at the top with a brick arch, pierced with holes of different sizes. The kilns are charged from an opening which is constructed in one of the side walls, which opening is, of course, during the burning, blocked up and well secured. The fuel used is turf, as in the brick kilns, and the fire is kept up for forty hours together, which is considered enough for the burning. Three days are then allowed for cooling, and they are afterward taken out of the kiln. Those tiles which are to be made of a grayish color are thus treated: it having been ascertained that the tiles are burnt enough, and while still red-hot, a quantity of small fagots of green alder with the leaves on is introduced into each flue. The flue-holes are then well secured, and the holes in the roof each stopped with a paving-tile, and the whole surface is covered with four inches or five inches of sand, on which a quantity of water is thrown, to prevent the smoke from escaping anywhere. It is this smoke which gives the gray color to the tiles, both internally and externally. The kiln is then left closed for a week, when the sand is taken off the top, the door and roof holes are opened, as also the flue-holes, and the charcoal produced by the fagots taken out. Forty-eight hours after, the kiln is cool enough to allow of the tiles being taken out and the kiln charged again. Whenever any of the tiles are to be glazed, they are varnished after they are baked; the glaze being put on, the tiles are put in a potter's oven till the composition begins to run. The glaze is generally made from what are called lead ashes, being lead melted and stirred with a ladle till it is reduced to ashes or dross, which is then sifted, and the refuse ground on a stone and resifted. This is mixed with pounded calcined flints. A glaze of manganese is also sometimes employed, which gives a smoke-brown color. Iron filings produce black; copper slag, green; smalt, blue. The tile being wetted, the composition is laid on from a sieve.

The manufacture of tiles is principally carried on near Utrecht, in the province of Holland, which, like most of the great cities of Holland, has facilities for the transportation of its produce by water communication all over the country. — *Glassware Reporter.*

A CALIFORNIA FLOUR MILL.



THE competition of India and Russia in the western European wheat markets is causing the merchants of California to use every effort to maintain their footing, and among other devices for lessening the cost of transport there is arising the practice of reducing the grain to flour before it is shipped, thereby effecting a saving of twenty per cent in freight. This carries with it the additional advantage of employing a large amount of local labor, and of turning the wheat to the best advantage, as by aid of new machinery and the best systems of milling, a far greater and better yield can be obtained than by the more antiquated methods which still to a great extent prevail here. Messrs. Starr & Co. are now building an immense flour mill and wheat elevator on the south shore of the Straits of Carquinez, about two miles below Porto Costa, and fronting the town of Crockett, to carry out this plan, the spot they have chosen being available for the largest ocean steamships, while it is sufficiently sheltered for the river barges from the interior to approach it with safety. At the site of the mill the shore curves inwards, leaving a flat rock reef mostly bare at low-water, but sloping off abruptly on the northern and western edges. Upon this reef there is being erected an eight-story mill and elevator building, about 150′ x 300′, reared upon a superstructure of artificial-stone piers and arches. The piers, of which there are 209, averaging from 5 to 8 feet square at the base, and standing 13 feet apart from centre to centre, are built upon the rock, and are connected by groined arches, standing some four feet clear above high-water level, which has an open passage under them, between the piers. The artificial-stone floor of the mill and elevator is laid over the arches, and forms a monolithic platform of nearly 50,000 square feet area. There will be 140,000 cubic feet in the piers, arches and floors, the greater part being already in position, and heavy wire cables are being laid transversely through and through the concrete above the arches to serve as earthquake ties. This portion of the work, which will cost $50,000, is being done by Mr. Ernest L. Ransome, who has long been occupied in California bringing into extensive and successful use the artificial stone invented by his father, Mr. Frederick Ransome, a number of years ago. The mill building will be 143′ x 158′, with seven stories, aggregating 100 feet in height, while the elevator, 82′ x 178′, is to be capable of storing 10,000 tons of wheat. The outside walls of the great building will be formed of heavy buttresses, rising over the artificial-stone piers, and connected with curtain walls. The floors, above the first story, will be carried by clusters of five wooden pillars, 13 feet apart. The engines and boilers are in a separate structure, the power provided for milling purposes being 2,400 horse-power, and for the elevator 300 horse-power. The ultimate capacity of the mill will be 6,000 barrels of flour per day, but it will be started with machinery for turning out 2,500 barrels per day. Agents of the company are now in Europe inspecting all the best milling machinery and processes. The docks, to be covered by two-story warehouses, are in two sections, having an open slip 104 feet in width between them. The eastern dock section will have an area of 115,000 square feet, and the western section one of 256,800 square feet, and both are to be traversed by railway lines in connection with the railroad systems of the State. From this account an idea will be gained of the extent of the enterprise which Messrs. Starr & Co. are inaugurating, and the magnitude of the trade in which they are engaged, and which they are making such great exertions to keep.— *Engineering.*

Electric Street Cars in Paris.— A trial trip was successfully accomplished lately in Paris by the French Electrical Power Company. At three o'clock, the vehicle, an ordinary three-horse tram-car, left the Place de la Nation, and after traversing the important thorough fares, reached the starting point soon after six o'clock, the distance—thirty miles—thus being made in three hours, and without the slightest accident, or frightening of horses on the route. When meeting any impediment the driver had no difficulty in bringing the car to a standstill in a second. The ease with which the car was turned off one set of lines to another, across several yards of unmetalled ground was likewise admirable. The locomotion is effected by Faure Sellon-Volckmar accumulators. The speed was nine and one-third miles an hour on level ground, and five and one-half on an ascent. This experiment, the first ever made over a long distance, proves the practicability of electric tram-cars, and it may safely be predicted that before long they will take possession of the tram routes of Paris. The estimated cost is one-half that of horse trams.— *London Standard.*

TIMBER-TESTING.

WE take the following from an English contemporary on "Testing Timber": Besides straight and close grain, freedom from sap, shakes, and loose knots, good timber, such as the best deals, should have a uniform color throughout. Appearances of timber may mislead if they are not in accordance with well-understood characteristics of soundness. In the same species of timber the strongest and most desirable specimens will be marked by narrow, regular, annual rings, indicating slow growth and close texture. The cellular tissue, as seen in medullary rays, should also be firm and compact. Uniformity of substance is one of the chief characteristics of good timber; dead knots, flaws, and shakes are, of course, prejudicial, and affect the strength. In sawn timber the architect should see that the surface is not woolly, and that it does not clog the teeth of the saw. A bright, silky lustre ought to be apparent when planed, while "a dull, chalky appearance," says one authority, "is a sign of bad timber." When the annual rings are porous, the wood is weak. Mr. Britton has remarked that good timber is sonorous when struck, while a dull, heavy sound betokens decay. "Star shakes" and "cup shakes," or splits in the direction of the rays and rings, are to be avoided, especially heart shakes, which prevent large scantlings being cut. Good deals have a uniform color, and a darkness of tone is a sign of strength and durability. In best pine timber the annual rings are hard, of a dark-red color, but these vary in tint; the rings ought not to exceed one-tenth of an inch. Oak, if of the best kind, should have "a pale brownish-yellow color, with a perceptible shade of green, a firm and glossy surface, and hard and compact medullary rays." Laslett observes: "Bright-looking timber is better in quality than dull, and that which is smooth in the working better than the rough or woolly surfaced." "The heart of trees having the most sapwood is generally stronger and better in quality than the heart of trees of the same species that have little sapwood." No doubt the microscope affords a better test of good timber than the unaided eye. The use of the microscope in testing timber was noticed in a paper read at the Franklin Institute, Philadelphia, in which the author showed that timber condemned by that instrument cannot be mistaken, and after once seeing and comparing samples of good and bad wood, it is easy to recognize the difference with a pocket magnifying glass. The micro-photographs of timber of different sorts have shown that in the strong kinds the concentric layers are close in texture and narrow in width, and the radial plates numerous, wide, long, and stout, while in poor wood the opposite characteristics prevail. With such sections of timber of known strength it would be easy to discard samples which did not exhibit the same number of rings or radial plates per inch of section. Generally, it will be found that the strongest scantlings are obtained near the sap. It is considered, as a rule, that American pine is generally less durable than that from the Baltic, though it may be clean and free from defects. The Prussian timber stands the first in the order of quality, according to Mr. Laslett, then the timber from Russia, Sweden, Finland, and Norway.

NUTS AND WASHERS.

CHAMPAIGN, ILL., October 17, 1883.

TO THE EDITORS OF THE AMERICAN ARCHITECT: —

Gentlemen, — It appears that in the article on "Rod-ends, Nuts, Washers," etc., the writer should have stated the reasons by which he was induced to recommend two different sizes of washers for rods of equal diameters and apparently resisting equal strains, according to their use in roof or bridge trusses.

The construction of roofs, excepting by a very few architects and engineers, is not at all on the same plane as that of bridges, for several reasons.

1. The loads to be supported are not so well known or so carefully estimated.

2. The strains are therefore less correctly obtained. In many cases they are not computed at all, but the truss is an imitation of one previously erected and of similar proportions. Compare the relative fulness and accuracy with which roof and bridge trusses are treated in any American work professing to consider both.

3. The materials are selected for roof-trusses with much less care, a fact easily proved by a comparison of the usual specifications for roofs and bridges. They are rarely tested, and it is therefore to be presumed that the interest of the contractor would lead him to supply materials of inferior quality, because cheaper.

4. The work is not so well done, and welds are generally permitted in wrought-iron rods, which are not allowed in good bridge-work.

5. The inspection of materials and work is much less rigid, for the clients of an architect do not so well appreciate the saving which results from the use of good materials, first-class workmanship, frequent tests of the materials supplied, and an efficient inspection, with a permissible lowering of the factor of safety in consequence, as do good railway presidents and superintendents.

Consequently, it appeared to the writer that iron rods of the ordinary sizes, employed in roof-trusses, could not be deemed to possess more than two-thirds the strength of rods of the same diameter used in bridges. It then becomes evident, that when these rods are exposed to their maximum strain, caused by the greatest possible snow-load or wind-pressure, their real factor of safety is little more than 3, instead of 5, which it appears to be. This maximum strain may never occur, or at very distant intervals, so that a really smaller factor of safety can be used in roofs than in bridges, as the latter may receive a maximum load on the passage of every heavy train.

The resistance of the wood to crushing under the washer is much less affected by imperfect materials and workmanship than the tensile strength of the rods.

If the wood be not decayed or shaky, and the bearing surface be tolerably flat and nearly at right angles to the axis of the rod, it may be reasonably expected to safely resist four-fifths that pressure, which would commence to crush the average specimen. The indentation would be less than one-twentieth inch in depth. This maximum pressure but seldom occurs in roofs, but in bridges the pressure of the washers is materially increased every time a train passes, frequently producing a sensible impact against the wood, which necessarily increases its crushing effect. Moreover, bridge-trusses being much more exposed to the weather, water is likely to penetrate into every joint and to cause incipient dry-rot under many of the washers, which further lessens the resistance of the wood.

Considering all these things, it was deemed to be approximately correct, and in accordance with the actual state of affairs in the two kinds of constructions, to make the bearing area of washers in bridges double that used in roofs for rods of equal diameter and nominal strength.

The primary assumption on which Mr. Patton's criticism is based, is that rods of equal diameter possess equal strength as ordinarily used in roof and bridge trusses, and that the rods in the roof-truss may even be trusted to safely resist a strain fifty per cent greater than the maximum strain permitted on the bridge-rod, because this strain may seldom or never occur. The reasons just given show this assumption to be quite erroneous in ordinary practice. Were roofs constructed with the care and scientific skill now employed in the best bridge-work, the writer is perfectly willing to admit that the nominal factor of safety might be made for rods of roof-trusses, perhaps two-thirds that employed in bridges, with equal safety. Still, the bearing area of the washers need not be so great in roofs as in bridges, even in that event, because the effect of impact and the deterioration by dry-rot are much less.

In providing formulæ and tables to be employed for two different purposes, by two different classes of professional men, whose education has been carried out on different lines, attention must be paid to the manner in which they will probably be applied by architects and engineers, so as to ensure both safety and economy of material, so far as possible.

Should any one prefer to employ other values for factors of safety and resistances of wrought-iron and wood, it would take but a few days to compute a table adapted to the desired values, by means of the general formulæ given in the article referred to, and which are perfectly general. Yours truly, N. CLIFFORD RICKER.

BOOKS ON ROMANESQUE ARCHITECTURE.

NEW YORK, October 23, 1883.

TO THE EDITORS OF THE AMERICAN ARCHITECT: —

Dear Sirs, — In No. 408 I notice that you mention in an answer to "A. B. C," A. Levy, Astor Place, N. Y., for photographs on Romanesque architecture. Having such I suppose you wanted kindly to refer to me. I beg to let you know that my address is No. 4 Bond Street. I am also agent for Morel's works, but do not think I could import Revoil's "*Architecture Romanesque*" for $50, when it costs in Paris $60. However, I am willing to furnish it for about $65 unbound, and the same for Viollet-le-Duc's "*Dictionnaire d'Architecture.*" Yours truly, A. LEVY.

TO THE EDITORS OF THE AMERICAN ARCHITECT: —

Dear Sirs, — "*Monuments de l'Architecture Chretienne*," par Henri Hubsch, Paris: 1866, is the title of what, so far as I know, is the best book on Romanesque architecture. It costs about $20, and can be ordered through any importing bookseller. It gives no Norman examples, but otherwise is very full. I recommend it to your inquiring friend. Very truly yours, CHAS. BABCOCK.

AN ECONOMIC SUGGESTION.

BOSTON, October 25, 1883.

TO THE EDITORS OF THE AMERICAN ARCHITECT: —

Gentlemen, — Apropos of the Atlanta State Capitol Competition, I trust you will do the profession at large a favor by ascertaining and publishing the names of the architects who respond to the invitation and furnish the drawings, etc., called for by the Commissioners; for, judging by my own experience, it would be cheaper to employ the gentlemen who are willing to work for something less than one-half of one per cent, and to get that only in case

drawings are accepted, than to pay salaries to draughtsmen, office-rent, etc., as is now customary with my professional brethren with whom I come in contact. Yours truly, W. W. L.

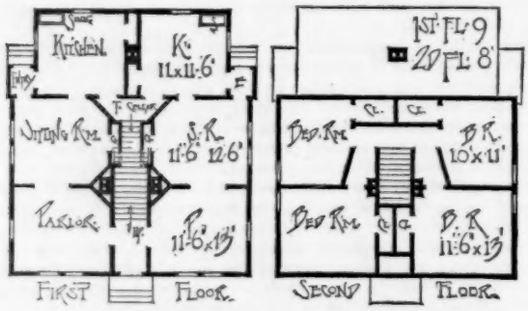
A THOUSAND DOLLAR DOUBLE-HOUSE.

Dover, N. H., October 10, 1883.

To the Editors of the American Architect: —

Dear Sirs, — I saw in your last issue J. T. B.'s letter of September 25, and, more in fun than anything else, I thought I would see what such a house as he calls for would cost, thinking of course that it would be impossible to build such a house for the sum named. But if J. T. B. will not find too much fault with the quality of stock and workmanship, he may possibly build such a house as I have drawn, providing that he can steal the plans and the profit of the builder.

Yours very respectfully, Charles E. Joy.



ESTIMATE FOR J. T. B's $1,000-HOUSE.

140 yds. excavation @ 25 c.	$ 35.00
670 sq. ft. stone wall @ 16 c.	107.20
8,000 brick all laid @ $12.	96.00
3,900 ft. frame, all raised @ $18.	70.20
5,400 " hemlock boards all on @ $18.	97.40
13 M. spruce shingles all laid @ $3.50.	45.50
1,300 spruce clapboards " " $30.	39.00
18 windows all finished complete, @ $4.	72.00
28 doors " " " " $4.	112.00
1,800 ft. upper floors all laid @ $26.	46.80
680 yds. plastering @ 13 c.	88.40
10,000 laths all on @ $3.75.	37.50
Plumbing, including sinks	15.00
Painting, two coats inside and outside	125.00
Nails	25.00
Other expenses.	75.00
Total	$1,074.00

This estimate is based on prices prevailing here at the present time.

NOTES AND CLIPPINGS.

A House at Sea. — The building formerly owned and occupied by Professor Walter Smith at the corner of Q and Fourth streets, South Boston, Mass, has been moved to another site in a novel manner. This building is thirty-six feet wide and forty feet deep, with an L eighteen by twenty-seven feet. It is two and a half stories high, with a slated roof, back-plastered, and has five heavy chimneys extending ten feet above the roof, the weight of the building being about two hundred and sixty tons. It was placed on three large deck-scows and in one hour was towed around the Point to Ninth Street. The building was towed by the steam-tug *William H. Clark* while the wind was quite fresh.

Liability of Owner of Building. — A traveller in returning to his hotel before daylight after missing his train fell into an unguarded excavation in a sidewalk in front of a bank and sued the corporation to recover damages for his injuries. On the trial, (Faller *vs.* Citizens' National Bank,) in the United States Circuit Court for the Northern District of Ohio, it appeared that the cashier acting for the bank had let the work of making a vault for the bank to a contractor, who was to make the excavation and finish the whole work, no reservation being made of any control or direction over the contractor in its construction, or over the construction of the work, or the place where it was being constructed, or the mode of its execution, or the workman to be employed to do it. The compensation was a reasonable price by the day. Judge Walker, in his charge to the jury, said: — "This contract made the builder an independent contractor, and the defendant is not liable for his negligence in not providing suitable guards against danger to persons passing on the sidewalk. The mere fact that the contractor was to be paid a reasonable compensation for the work when completed, or was to be paid by the day, no fixed price being agreed on, does not of itself change his relation to the defendant; nor does the fact that the defendant was to furnish material with which the vault was to be constructed change the relation." — *Southern Trade Gazette.*

New Orleans Bridge. — A big bridge is projected at New Orleans. The Mississippi River there is 2,400 feet wide. An engineer proposes seven spans of 300 feet each, one to be a draw. The piers are to be creosoted piles, driven in clusters, and heavily capped and cased with iron. The depth of the water will be no obstacle, as the piles can be spliced. The estimated cost is $13,000,000.

The Portrush, Ireland, Electric Railway. — The electric railway from Portrush to the Giant's Causeway, Ireland, seems to have opened very auspiciously. The power to work the dynamo-electric machines costs little besides tear and wear of the machinery, a waterfall with a head of twenty-four feet in the River Bush setting in motion turbines which give an effective energy of about ninety horse-power. The line is only about six miles long, and has but a three-foot gauge. An underground cable conveys the electricity to the end of the rails. What defects exist on the road are two sharp curves and two steep grades. One foot in thirty-five will tell eventually on the rails and the rolling stock. — *Exchange.*

The Cincinnati Sketch-Club. — The architectural students and draughtsmen of Cincinnati have lately organized a sketch-club. There are now fifteen members of the club, and meetings are held once in two weeks, at which time each member must have at least one sketch of some architectural subject. The club is the outgrowth of a movement started some months ago by the architects of the city, allowing a half-holiday every Saturday to the young men, whereby it was hoped and expected that the students would visit houses in process of construction. So far the movement has proved beneficial alike to both scholar and teacher, as the former takes more interest in his work, and of course the latter reaps the material benefit of such increased interest.

Obituary. — James Baker, a well-known glass painter, who for many years devoted thought and means to improving glass for decorative purposes, died October 18th, in New York City, at the age of sixty years. He was at one time associated with the late C. Wenston, of England, whose full and comprehensive works on glass many are familiar with. He came to the United States in the year 1868, and soon commenced to improve the method of making stained glass. In 1876 he produced the first disc of colored glass, previous to which date only plain ruby glass had been made in this form by Mr. James Green, of Messrs. Powells, London, England. This occurrence marked the beginning of the present movement in the manufacture of stained glass in the United States, for as soon as it became known that such exquisite material could be obtained, those who had been using imported glass had their eyes opened, as it were, and soon discarded it for the improved bulls-eye disc glass. He further improved this glass by imparting to it a semi-opaque body, adding solidity to the already beautiful material. This action it was that led ultimately to the production of opalescent or crockery glass now so extensively used. It is in justice to his memory these remarks are made, as during life he cared little for the recognition his services merited; his sole aim was to achieve success in his search for hidden treasures of the art. Just prior to his death he had succeeded in producing a cameo or high relief glass, very different from anything now in use. The profession have thus lost a useful man who had a thorough knowledge of all that appertains to decorative glass; he was a good colorist, and a skilful draughtsman.

How to Prevent Smoke. — Professor Roberts, in discussing the smoke-abatement problem before a Parliamentary committee, said: — "M. Delezenne estimated in 1855 that the proportion of carbon that escaped combustion in this form might be taken at 5 per cent of the total weight of fuel burned in the grate, and 6,320 kg. of soot fell in twelve hours on the town of Lille. But, as Emile Burnat, quoting Payen, pointed out in a valuable paper on the combustion of smoke in boiler furnaces, the amount of finely-divided carbon produced in a certain lamp-black factory is only 3 per cent of the coal burned, and therefore the amount of carbon in ordinary smoke must be much lower. In 1858 Mr. John Graham estimated that very black smoke does not contain more than 0.1 per cent of the carbon of the coal burned, and the accurate experiments of M. Schewrer-Kestner showed that in boiler furnaces the loss of carbon in the form of soot never exceeds 1 per cent of the fuel burned, while the mean loss is probably between 1·2 and 3·4 per cent. A case, however, is recorded in which a coal containing 69 per cent of carbon (burned with an inadequate supply of air) thus lost an amount of carbon as soot equal to 2.03 per cent of the fuel burned. As might be anticipated, the amount of soot is greater in the case of an open fireplace than in a boiler furnace. But the evidence afforded by the results of tests made at the exhibition, while possessing much interest, does not, unfortunately, render it possible to give a precise answer to the question, for the following reasons: Some of the soot must have been deposited in the flue before it reached the point at which the withdrawing tube was inserted, and there is reason to fear that in the withdrawal of flue-gas laden with soot, through any form of slit or orifice in a tube, the gaseous and solid portions may not enter into exactly the ratio in which they exist in the chimney. In many cases the flues were carefully swept before and after the trial, and the soot collected and weighed. In an extreme case, in an open fireplace, no less than 2 1-4 per cent of soot, compared with the fuel burned, was found in the flue at the end of the trial. In the case of three close stoves of careful construction, rather less than 1-2 per cent was found, while in some cases it fell to 1-4 per cent, and in one case to 1-20 per cent. Of course, these numbers do not include the amount escaping into the air. I may perhaps add that in a preliminary experiment, made with an ordinary open fireplace, connected with a chimney by means of a sheet-iron pipe 6 feet long and 9 inches in diameter, 17 pounds of bituminous coal were burned in three hours, and no less than .61 per cent of the fuel burned was collected in the pipe in the form of soot, while the soot that passed into the chimney was not collected. This .61 per cent of soot, after drying at 100° C., yielded, on distillation at 300° C., 12 per cent of an oily, strong-smelling mixture of hydro-carbons."

BUILDING INTELLIGENCE.

(Reported for The American Architect and Building News.)

[Although a large portion of the building intelligence is provided by their regular correspondents, the editors greatly desire to receive voluntary information, especially from the smaller and outlying towns.]

BUILDING PATENTS.

[Printed specifications of any patents here mentioned, together with full detail illustrations, may be obtained of the Commissioner of Patents, at Washington, for twenty-five cents.]

286,990. VISE. — James O. Barrett, Erie, Pa.

286,995. VISE. — Charles M. Boyce, Stoneham, Mass.

287,012. ELEVATOR. — William Dutemple, Boston, Mass.

287,013. ENDLESS HOD-ELEVATOR. — Oliver N. Eaton, New York, N. Y.

287,021. LEVELLING-ROD. — William Gurley, Troy, N. Y.

287,039. SLIDING-DOOR PULL. — Thomas Lyons, Hartford, Conn.

287,055. WINDOW-VENTILATOR. — John G. Reinl, New York, N. Y.

287,058. FIRE-ESCAPE. — LaFayette Sawtelle, Lena, Ill.

287,065. DOOR-HANGER. — Sidney M. Stevens, De Kalb, Ill.

287,071. AUTOMATIC FIRE-EXTINGUISHER. — Caleb C. Walworth, Boston, and Osborn B. Hall, Malden, Mass.

287,099. STEAM-RADIATOR ATTACHMENT. — Richard T. Crane, Chicago, Ill.

287,122. STEAM AND HOT-WATER RADIATOR. — Johannes Haag, Augsburg, Bavaria, Germany.

287,142. FIRE-ESCAPE. — Charles J. Lung, Rochester, N. Y.

287,145. SPACING-INSTRUMENT. — James O. Madison, New York, N. Y.

287,149. RADIATING-DRUM FOR HOT-AIR FURNACES. — Jacob Miller and Daniel Mager, Allentown, Pa.

287,158. SHUTTER-FASTENER. — Samuel Poole, Brooklyn, N, Y.

287,179. AUTOMATIC FLUSHING-TANK. — Michael Sexton, New York, N. Y.

287,193. PIPE-WRENCH. — James L. Taylor, Ishpeming, Mich.

287,194. REVOLVING WRENCH. — Samuel A. Thomas, Charleston, Mo.

287,219. HATCHWAY-PROTECTOR FOR ELEVATORS. — Robert T. Bean, Mount Sterling, Ky.

287,220. WATER-CLOSET. — William P. Buchan, Glasgow, County of Lanark, Scotland.

287,230. TWO-ROOM-HEATING FIRE-BACK AND FRAME. — Jas. H. Burnam, Fayetteville, Tenn.

287,233. FIRE-ESCAPE. — William S. Cassedy, Kelly's Station, Pa.

287,245. WEATHER-STRIP. — Peter Cool, Manhattan, Kans.

287,246. SINK. — George Frederick Coomber, Kansas City, Mo.

287,257. FIRE-ESCAPE. — Dennis P. Edgar, Jackson, Mich.

287,271. VISE. — Porter A. Gladwin, Boston, Mass.

287,286. LIGHTNING-ROD JOINT. — Wm. Hewitt, London, Ontario, Can.

287,287. SAFETY-APPLIANCE FOR ELEVATORS. — John Hodges, Westfield, N. J.

287,342. LEVEL. — Lawrence Van Alstyne, Sharon, Conn.

287,357. FAUCET. — William A. Babcock, South Coventry, Conn.

287,369. MERCURY-SEAL TRAP FOR LAVATORIES, BATH-TUBS, ETC. — Abraham Edwards, Asbury Park, N. J.

287,371. JOINER'S PLANE. — William B. Fenn, Meriden, Conn.

287,373. TILE-HEARTH OR VESTIBULE-FLOOR. — Isaac L. Frankem, Indianapolis, Ind.

287,378. PIPE-TONGS AND CUTTER. — Henry Herbert, Cincinnati, O.

SUMMARY OF THE WEEK.

Baltimore.

DEPOT AND STABLES. — Messrs. Wyatt & Sperry, architects, have prepared drawings for the Pikesville Dairy Co., for a two-st'y brick depot and one-st'y brick stable, 40′ x 140′, cor. Argyle Ave. and Smith St.

CONSERVATORY.—The same architects have prepared plans for Chas. J. Bonaparte, Esq., for a conservatory, cor. Park Ave. and Centre St.; Mr. Anderson, builder.

BUILDING PERMITS. — Since our last report seventeen permits have been granted, the more important of which are the following: —

Shadrach & Romney, 4 three-st'y brick buildings, e s Chester St., between Fayette and Orleans Sts.

Jas. E. Cochran, 3 three-st'y brick buildings, e s Druid Hill Ave., between Rowert and Presstman Sts.

V. H. Freaner, two-st'y brick building, n s Vine St., between Stricker and Gilmor Sts.

Estate of Isaac Lobe, 2 three-st'y brick buildings, w s Gilmor St., between Lanvale and Townsend Sts.

Oliver S. Firor, 3 two-st'y brick buildings, n s Ramsey St., e of Addison Alley.

Geo. C. Hershman, 6 three-st'y brick buildings, s s Fairmount Ave., s e cor. Bankard Alley.

Geo. Walz, two-st'y brick building, w s Belair Ave., n of Chester St.

Wm. J. Spillman, 12 two-st'y brick buildings, n s Federal St., between Barclay St. and Carter Alley; 12 two-st'y brick buildings, s s Pinkney Place, between Barclay St. and Carter Alley; 12 two-st'y brick buildings, n s Pinkney Place, between Barclay St. and Carter Alley; and 11 three-st'y brick buildings, s s Lanvale St., between Barclay St. and Carter Alley.

D. & C. S. Streett, two-st'y brick warehouse, 30′ x 48′, n e cor. Hillen and East Sts.

Jos. Friedenwald, three-st'y brick building, w s Holliday St., between Saratoga and Lexington Sts.

There is no change in the labor market report for November, and none likely to occur the winter through.

Boston.

BUILDING PERMITS. — *Wood. — Skinner St.*, near South St., Ward 23, for Henry N. Turner, dwell., 26′ x 32′ 8″, two-st'y pitch.

Savin Hill Ave., near Pleasant St., Ward 24, for Edward McKechnie, dwell., 29′ 9″ x 33′, two-st'y pitch; Edward McKechnie, builder.

Western Ave., near North Harvard St., Ward —, for Glidden, Joy & Co., factory, 15′ x 20′ and 25′ x 60′, one-st'y flat.

Boylston Ave., near Green St., Ward 23, for Patrick Shehan, dwell., 22′ x 30′, two-st'y pitch.

Boylston Ave., near Green St., for John Heelens stable, 15′ x 20′, one-st'y pitch.

Edwards Court, cor. Rutherford Ave., Ward 5, for James H. Hall Estate, stable, 25′ x 30′, two-st'y flat.

Skinner St., near South St., Ward 23, for H. J. Dame, dwell., 24′ x 30′, two-st'y pitch; G. Dame, builder.

Chestnut Hill Ave., near Mt. Vernon St., Ward 25, for Jas. A. Hatheways, stable, 18′ x 40′ and 40′ x 45, one-st'y mansard; Benjamin Woods, builder.

North Beacon St., rear, cor. Everett St., Ward 25, for Mrs. Sarah W. Whiting, stable, 28′ x 30′, one-st'y pitch.

Unnamed St., off Centre St., Ward 23, for Mrs. Caroline E. Lewis, dwell., 27′ x 30′, two-st'y pitch; Holbrook & Harlow, builders.

Unnamed St., off Centre St., Ward 23, for Mrs. Caroline E. Lewis, dwell., 34′ x 34′, two-st'y pitch; Holbrook & Harlow, builders.

Rutherford Ave., opposite Furbush Court, Ward 5, for David Whiting & Sons, milk-shed, 17′ and 20′ x 200′, one-st'y flat; C. O. Stone, builder.

Rutherford Ave., rear, opposite Winchester St., Ward 5, for Samuel and Richard Lombard, storage, 20′ x 75′, one-st'y pitch; N. T. Hanson, builder.

Iliad St., near Cottage St., Ward 20, for Wm. Donaldson, 2 dwells., 20′ and 22′ 6″ x 29′; 2 dwells., 25′ 6″ x 30′, two-st'y pitch; Wm. Donaldson, builder.

Brooklyn.

BUILDING PERMITS. — *Ellery St.*, n s, n w cor. Beaver St., 10 three-st'y frame double tenements, tin roofs; owners, J. Rueger and V. Weisensee, 250 Moore St.; builder, J. Rueger.

Twenty-seventh St., n s, 280′ w Fourth Ave., 2 three-st'y brick tenements, felt and gravel roofs; cost, each, $3,500; owner, Michael Kinney, 202 Twenty-first St.; builder, Chas. Long.

Lorimer St., w s, 170′ s Norman Ave., 4 three-st'y frame tenements, gravel roofs; cost, total, $18,000; owner, Jas. Bostwick, 112 Norman Ave.; architect, F. Weber; builders, J. & J. Van Riper and A. J. Hulse.

Putnam Ave., Nos. 350 to 358, s s, w of Marcy Ave., 5 three-st'y brownstone front dwells., tin roofs; cost, each, $5,500; owner, architect and builder, T. W. Swinm, 389 Putnam Ave.

Classon Ave., w s, 25′ s Park Ave., three-st'y brick factory, tin roof; cost, $4,200; owner, J. W. Court, 342 Kent Ave.; architect, S. Harvey; builders, Thos. Baker and Alexander McKnight.

Fulton St., n s, 194′ 8″ e Grand Ave., 8 four-st'y brick, stone front stores and tenements, tin roofs; cost, each, $10,000; owner of two, W. H. Aldrich, 1855 Fulton St.; owner of the remaining six, B. B. Thornell, Madison Ave., cor. Eighty-first St., New York City; architect, Robert Dixon; builder, W. H. Aldrich.

Atlantic Ave., s s, 100′ e Franklin Ave., two-st'y brick double tenement, tin roof; cost, $4,200; owner, Jno. J. Drake, 77 Lexington Ave.; architect, A. D. Howe; builders, Philip Sullivan and Wm. Brown.

Vanderbilt Ave., No. 319, two-st'y brick stable, tin roof; cost, $2,600; owner, J. O. Mahones; architect, R. B. Eastman; builders, Long & Barnes.

Hancock St., s s, 280′ e Nostrand St., three-st'y brownstone front dwell., tin roof; cost, $10,000; owner and builder, H. A. Weed, 243 Putnam Ave.; mason, Geo. Phillips.

Willoughby Ave., s s, 245′ w Broadway, four-st'y brick double tenement, tin roof; cost, $10,000; owner, B. J. Warner, 81 Morton St.; architects, Parfitt Bros.; builders, W. & T. Lamb, Jr., and Cardwell & Hawkins.

Gates Ave., n s, 162′ e Franklin Ave., three-st'y brick dwell., tin and slate roof; cost, $12,000; owner, Geo. A. Bell; architects, Parfitt Bros.; builders, J. Ashfield & Son and Martin & Lee.

Lewis Ave., s w cor. Bainbridge St., three-st'y brick dwell., felt and gravel roof; cost, $6,500; owner, E. J. Granger, 123 MacDonough St.; architect, A. Hill.

Lewis Ave., w s, 20′ s Bainbridge St., 5 two-st'y brick dwells., felt and gravel roofs; cost, each, $3,000; owner and architect, same as last.

North Seventh St., No. 95, n s, about 100′ from Second Ave., four-st'y frame double tenement, tin roof; cost, $4,700; owner and builder, Henry Richers, 44 North Second St.; architects, Rentz & Wirz.

North Seventh St., No. 95, n s, about 100′ from Second Ave., on rear, four-st'y frame double tenement, tin roof; cost, $3,200; owner, etc., same as last.

Wallabout St., n s, 100′ e Wythe Ave., 9 three-st'y brick dwells., tin or gravel roof; cost, each, $3,000; owner, architect and builder, D. H. Brown, 143 Bedford Ave.; mason, Matthew Smith.

Boerum Pl., No. 29, four-st'y brick store and dwells., tin roofs; cost, $7,000; owner, Sarah Brien, Schermerhorn St.; architect, C. F. Eisenach; builders, Thomas Donlon and Conrad Dietrick.

Pleasant Pl., n e cor. Atlantic Ave., 7 two-st'y frame, gravel roofs; cost, each, $2,700; owner, G. H. Bishop, 49 Broadway, New York City; architect, G. H. Chamberlain; builder, Wm. Wright.

Pulaski St., s s, 80′ e Marcy Ave., two-st'y brownstone private dwell., tin roof; cost, $4,500; owner, R. G. Fowler, Marcy Ave., cor. Pulaski St.; builder, A. Miller.

Ellery St., No. 33, two-st'y frame stable, tin roof; cost, $2,500; owner, Anton Miltner, 30 Hopkins St.; architect, John Piatte; builder, C. Wilber.

Quincy St., n s, 212′ e Tompkins Ave., 3 two-st'y brownstone front dwells., tin roofs; cost, each, $4,000; owner, architect and builder, G. De Revere, 663 Greene Ave.

Bleecker St., n s, 21′ w Evergreen Ave., 4 two-st'y frame tenements, tin roofs; cost, each, $3,000, owner, J. Menahan, Thirty-first St., near Sixth Ave., New York City; architect, F. Weber, builder, Thos. Goodwin.

Park Ave., s w cor. Spencer St., 2 four-st'y brick stores and tenements, tin roofs; cost, total, $13,925; owner, Walter Mayer, 150 Spencer St.; architect, H. Hollwedel; builder, Thos. Baker.

Fayette St., No. 12, s s, 100′ e Broadway, three-st'y frame store and tenement, tin roof; cost, $4,500; owner, architect and builder, T. Engelhardt, 14 Fayette St.

ALTERATIONS. — *Third Ave.*, n w cor. Fifteenth St., six buildings raised three feet; cost, total, $3,000; owner, Edward Kane, 6 President St.; house-movers, B. C. Miller & Son.

South Fifth St., n s, 45′ w second St., raised one st'y, also four-st'y brick extension, front rebuilt; cost, $9,000; owner, Geo. Young, First St., near South Fourth St.; architect, E. F. Gaylor; builders, Jas. Rodwell and R. B. Ferguson.

Greenpoint Ave., No. 35, two-st'y brick extension, tin roof; cost, $3,000; owner, A. H. Hubbers, on premises; architect, C. Dunkhose; builder, M. Vogel.

Buffalo, N. Y.

CHURCH. — Emanuel's Reformed Church, cor. Humboldt, Parkway and Utica Sts., frame; cost, $1.6 0.

FACTORY. — Addition to wall-paper factory of M. H. Birge Sons & Co., cor. Maryland and Niagara Sts.; cost, $6,000; architect, J. G. Cutler.

HOUSES. — Brick dwell., Delaware St., near Utica St.; cost, $11,000; owner, W. J. Donaldson; contractors, J. H. Tilden and J. W. Carroll.

Double brick dwell., for Dr. Geo. E. Fell, Prospect Ave.; cost, $9,500; architects, Caulkins & Co.

Residence, cor. Delaware and Tupper Sts., remodelling; cost, $18,000; owner, W. H. Walker; architect, R. A. Waite.

Double brick dwell., Niagara St., near Virginia St.; cost, $9,500; owner, S. L. Talcott.

Additions to Church Home, Rhode Island St.; cost, $5,000; architects, Silsbee & Marling.

STABLE. — Stone and frame stable for Geo. H. Lewis, cor. Connecticut St. and Front Ave.; cost, $6,000; architect, James G. Cutler.

STORE. — Main St., near North Division St., double store, brick and brownstone; owners, M. Messmer and Mrs. S. J. Birdsall; cost, $22,500; architect, Geo. J. Metzger.

Chicago.

FACTORY.—J. M. Van Osdel & Co., architects, planned the furniture factory for E. H. Shirk, on Canal St., s of Harrison St., five-st'y, 88′ x 150′; cost, $56,000.

FLATS. — J. M. Van Osdel & Co., architects, have completed plans for flats for E. H. Gammon, on Monroe St., near Morgan St., three-st'y, Bedford stone front; cost, $10,000.

The same architects planned the flat for A. B. McCourtie, on Park Ave., near Hoyne St., three-st'y, 30′ x 65′; cost, $8,000.

HOUSES. — Burnham & Foot are architects for two-st'y house, stone front, 47′ x 70′, for Joseph Frank, on Michigan Ave., between Thirty-third and Thirty-fourth Sts.

J. M. Van Osdel & Co. are architects for 2 three-st'y houses on Ashland Ave., for S. D. Stanbro; cost, $9,000 each.

The same architects planned a dwell for Mrs. Spry, cor. Monroe and Loomis Sts., three-st'y, 33′ x 76′; cost, $25,000.

J. M. Van Osdel also planned dwell. for J. M. Adsit, cor. Dearborn Ave. and Elm St., three-st'y, 34′ x 55′; cost, $35,000.

Same architects made plans for B. L. Crumb's house, cor. of Adams and Leavitt Sts., two-st'y, 25′ x 46′, brownstone front; cost, $7,000.

OFFICE-BUILDING. — J. M. Van Osdel & Co., architects, have completed plans for the office-building for J. P. Parker, six-st'y, 50′ x 100′, first st'y of McArthur brownstone, upper stories faced with Anderson pressed-brick, to be fire-proofed by the Ottawa Tile Co.; cost, $100,000.

WAREHOUSE. — J. M. Van Osdel & Co. planned the warehouse for Ewing Estate, on Milwaukee Ave., near Lake St., three-st'y; cost, $12,000.

BUILDING PERMITS.—S. V. Clark, 2 three-st'y dwells., 69 and 71 Pine St.; cost, $15,000; architect, J. J. Egen, builder, Jno. McGinnis.

P. Kalteux, three-st'y dwell., 369 Ashland Ave.; cost, $4,500.

W. Gastfield, three-st'y store and dwell., 416 West Chicago Ave.; cost, $5,000.

D. O'Donnell, two-st'y and basement dwell., 606 Taylor St.; cost, $3,000.

P. Quirk, two-st'y store and dwell., 565 West Indiana St.; cost, $3,000.

John D. Parker, six-st'y office building, 6 and 8 Sherman St.; cost, $100,000; architect, J. M. Van Osdel.

G. Payson, three-st'y dwell., 454 Dearborn Ave.; cost, $5,000; architect, C. P. Thomas; builder, N. Gerten.

Marks & Cohn, four-st'y store and flats, 125 East Chicago Ave.; cost, $13,000; architect, J. Starbuck; builder, Jno. Petrow.

H. McHatton, 3 three-st'y flats, 322 to 326 Mohawk St.; cost, $18,000; architect and builder, N. E. Martin.

Western Indiana R. R. Co., three-st'y flats, 228 Fourth Ave.; cost, $8,000; architect, Jno. Wagner.

A. C. Wakeman, two-st'y dwell., 380 Warren Ave.; cost, $6,000.

J. K. Russell, addition to factory, 90 and 92 Fulton St.; cost, $4,000.

Dr. H. S. Sloan, two-st'y and basement dwell., 498 West North Ave.; cost, $5,000.

Thos. Parcell, four-st'y store and dwell., 153 West Twelfth St.; cost, $7,000: architect, Ruehl.

McGraw & Downey, repair theatre; cost, $30,000.

David Hogg, three-st'y dwell., 399 Oak St.; cost, $5,000.

Alex. D. Hannah, three-st'y dwell., 409 Oak St.; cost, $5,000.

U. P. Smith, two-st'y dwell., 3232 Groveland Park; cost, $10,000.

Jno. Lawler, three-st'y store and flats, 189 Wells St.; cost, $7,000.

E. L. Brand, four-st'y store-building, 73 and 75 East Jackson St.; cost, $15,000; architect, Adler; builder, J. F. Barney.

A. Plamondon, 2 two-st'y dwells., 411 and 413 West Monroe St.; cost, $10,000.

R. S. Critchell, three-st'y dwell., 106 Centre Ave.; cost, $6,000.

J. W. Mills, two-st'y dwell., 903 West Monroe St.; cost, $7,000.

A. Holpech, three-st'y store and dwell., 661 Throop St.; cost, $5,500; architect, F. Keltenech.

Mrs. Julia Decreet, two-st'y dwell., 3654 Forest Ave.; cost, $5,000; architect, G. Viegant.

D. B. Scully, 5 two-st'y dwells., 66 to 74 Sheldon St.; cost, $20,000; architect, G. Vigeant; builder, Aug. Kaiser.

Wm. Grace, three-st'y store and dwell., 3448 Wentworth Ave.; cost, $5,500; architects, Cobb & Frost.

McKee & Tuthill, three-st'y store and flats, 2013 and 2015 State St.; cost, $13,000; architect, J. R. Willett; builder, Wm. Grace.

Jas. Kirkland, three-st'y flats, State St., cor. Huron St.; cost, $35,000; architect, Jno. N. Tilton.

Mrs. M. C. Sands, 6 two-st'y dwells., 739 to 749 Harrison St.; cost, $15,000.

G. D. Baldwin, two-st'y dwell. and barn, 2925 Prairie Ave.; cost, $15,000; architects, Burnham & Root, builder, E. Sturtevant.

W. H. White, three-st'y dwell., 423 East Superior St.; cost, $7,000; architects, Treat & Foltz; builder, Geo. Gries.

J. Reider, two-st'y store and dwell., 342 Lincoln Ave.; cost, $4,000.

Cincinnati.

Building Permits. — Lars Anderson, five-st'y brick store on Pearl St., between Race and Elm Sts.; cost, $25,000.

L. Razelle, two-st'y frame dwell., Euclid Ave., near Auburn St.; cost, $3,800.

E. Coombe, two-st'y brick dwell., s e cor. Bigelow and Carmalt Sts.; cost, $6,000.

E. Coombe, two-st'y brick dwell., s w cor. Josephine and Carmalt Sts.; cost, $6,000.

M. Werke, three-st'y brick building, Ninth St., near Vine St.; cost, $3,000.

J. Bierbaum, two-st'y brick building, Dayton St., cor. Western Ave.; cost, $2,600.

John F. Winslow, three-st'y brick store and dwell., Gilbert Ave., near McMillan St.; cost, $10,000; J. W. McLaughlin, architect.

Dr. F. Brunning, three-st'y brick building, Gilbert Ave., near McMillan St.; cost, $5,500.

T. J. McCoy, two-st'y brick dwell.; cost, $3,000.

D. Harris, two-st'y brick building, Findlay St., near Freeman Ave.; cost, $3,500.

Wm. R. Teasdale, 2 two-st'y brick buildings, Lincoln Ave., near Lane St.; cost, $8,000.

Enterprise Carriage Manufacturing Co., seven-st'y brick factory, cor. Court and Sycamore Sts.; cost, $18,000.

Twenty-one permits for repairs; cost, $13,000.

New York.

Apartment-House. — For Mr. W. J. Gessner, a five-st'y brownstone apartment-house, 25′ x 68′, is to be built on the west side of Fourth Ave., 75′ s of Eighty-eighth St., at a cost of about $18,000, from designs of Messrs. Thom & Wilson.

Warehouse. — For Messrs. Phillip Strobel & Sons, a seven-st'y warehouse and store, Philadelphia face-brick and iron front, is to be built at Nos. 53 and 55 Elizabeth St., from designs of Mr. Albert Wagner; cost, about $50,000.

Building Permits. — *Ave. A, No.* 1428, five-st'y brick tenement and store, tin roof; cost, $13,000; owner, Mathius H. Schneider, 1455 Ave. A, and Philip Lott; architect, Julius Kastner.

Riverdale Ave., w s, 150′ s Beach St., three-st'y frame dwell., slate and tin roof; cost, $2,550; owner, Michael Harrigan, Riverdale; architect, M. H. Couzens; builders, Daniel Harrigan & G. W. Varian.

Church St., e s, 150′ n Weber's Lane (Kingsbridge), two-st'y frame stable and carriage-house, shingle roof; cost, $2,000; owner, John Weber, Kingsbridge; builders, J. Weber and S. Berrian.

Eighty-sixth St., n s, 90′ w Tenth Ave., two-st'y brick and stone chapel, slate roof; cost, $20,000; owner, Eighty-fourth-street Presbyterian Church, Geo. P. Freeman, Chairman of Building Committee, 48 Elizabeth St.; architect, Leopold Eidlitz; builders, L. N. Crow and Maguire & Sloan.

Fifty-first St., n s, 125′ w First Ave., 2 five-st'y brick tenements, tin roofs; cost, each, $15,000; owners, Irwin & Smith, Ave. B, between Eighty-fourth and Eighty-fifth Sts. architect, Wm. R. Smith.

Grove Ave., w s, 50′ s One Hundred and Sixty-third St., one-st'y frame dwell., tin roof; cost, $3,600; owner, Carrie S. Harron, One Hundred and Sixty-first St., cor. Jackson Ave.; architect, H. S. Baker; builder, R. L. Harron.

West Eleventh St., Nos. 349 *and* 351, four-st'y brick stable, gravel roof; cost, $20,000; owner, John B. Gaden, 402 West Fifty-first St.; architect, Wm. R. Smith.

St. Ann's Ave., w s, 50′ n One Hundred and Forty-eighth St., 3 two-st'y frame dwells., tin roofs; cost, each, $2,500; owner and builder, Fred Schwab, Tinton Ave., cor. One Hundred and Fifty-first St.; architect, Adolph Pfeiffer.

First Ave., n w cor. Eighty-eighth St., five-st'y brick flat and stores, tin roofs; cost, $14,441; owner, Thos. Patton, 227 Greenwich St.; architect, Geo. M. Huss; builders, Gilbert M. Platt and Grissler & Fausel.

First Ave., w s, 50′ 8½″ n Eighty-eighth St., five-st'y brick flat and store, tin roof; cost, $40,286; owner, Mary C. King, 226 Greenwich St.; architect, Geo. M. Huss; builders, Gilbert M. Platt and Grissler & Fausel.

East Eighty-first St., No. 350, rear, two-st'y brick dwell., tin roof; cost, $3,000; owner, Henry Oelig, on premises; architect, William Fernschild; builders, Schwartz and L. Wirth.

Eighty-fourth St., n w cor. Lexington Ave., five-st'y brick flat, tin roof; owner, John Livingston, 981 Lexington Ave.; architect, F. T. Camp.

Fortieth St., s s, 225′ e First Ave., one-st'y brick gas-generating house and boiler-house, slate roofs; cost, $21,600; owner, Equitable Gas Light Co., Post Building, Exchange Pl.; architect, John F. Harrison, 231 Broadway; builder, Richard Deeves.

East Eighth St., Nos. 401 *to* 417, five-st'y brick factory, tin roof; cost, $55,000; owner, John Roach, foot of East Ninth St.; architect, Wm. J. Tryer.

First Ave., No. 1148, five-st'y brownstone front flat and store, tin roof; cost, $16,500; owner, Eva Muller, 446 East Seventy-sixth St.; architect, John Brandt.

Alexander Ave., e s, 50′ n One Hundred and Forty-third St., two-st'y brick store, tin roof; cost, $4,500; owner, Robert Spink, 268 Bleecker St.; architect, John Brandt.

Eighty-eighth St., n s, 275′ w First Ave. 5 five-st'y brick tenements, tin roofs; cost, each, $8,000; owner, Laura Haensgen, 303 East Eighty-fourth St.; architect, Wm. Graul.

Fourth Ave., w s, 75′ 6″ s Eighty-eighth St., five-st'y brownstone front flat, tin roof; cost, $20,000, owner, Wm. J. Gessner, 1722 Madison Ave.; architects, Thom & Wilson.

West Fifty-ninth St., Nos. 303, 305 *and* 307, four-st'y brick stable, tin or gravel roof; lessee, O. L. Jones, 1215 Broadway; architect, M. C. Merritt.

Croton Ave., n e cor. Jerome Ave, three-st'y stone and frame dwell., shingle roof; cost, $10,000; owner, St. James Church, Fordham; Gustav Schwab, Chairman Building Committee, Fordham; architect, E. A. Sargent; builders, Jacob Rief & C. V. Folin.

West Thirty-eighth St., No. 542, three-st'y brick dwell., tin roof; cost, $5,000, owners, Patrick and James Kennedy, 439 West Thirty-sixth St.; architect, Chas. F. Ridder, Jr.

East Seventy-sixth St., No. 421, four-st'y brick dwell. and store, tin roof; cost, $9,500; owner, Isidor Jesser, 1371 Third Ave.; architect and builder, Wm. Fernschild & Son.

Seventy-eighth St., n s, 150′ w Ninth Ave., 6 three-st'y brownstone front dwells., tin roofs; cost, each $9,000; owner and architect, Christian Blinn, s w cor. Ninth Ave. and Seventy-ninth St.

Seventieth St., n s, 100′ w First Ave., five-st'y brick tenement and store, tin roof; cost, $12,000; owner, Thos. Maloney, 349 East Seventieth St.; architect, R. W. Buckley.

Fleetwood Ave., s w cor. One Hundred and Sixty-second St., 3 two-st'y frame dwells., tin roofs; cost, each $2,500; owner, Hedwig Hoffman, 697 Eighth Ave.; architect and builder, Louis Falk.

Alterations. — *East Fifty-ninth St., Nos.* 110 *and* 112, raise one st'y on rear part of building; cost, $5,000; owner, Progress Club, Maurice Lowy, President, 127 East Fifty-ninth St.; architect, E. Gruwi; builder, Chas. Eberspacher and Westbrook Myers.

West Thirty-first St., No. 443, rebuild front and rear walls, raise one st'y, and a four-st'y brick extension: cost, $8,000; owner, Robert A. Greacan, 445 West Thirty-first St.; architects, Youngs & Campbell.

Broadway, Nos. 537 *and* 539, repair damage by fire; cost, $80,875; owner, Estate of B. F. Beekman, John R. Vandemer, exr., 318 West Twenty-ninth St.; architect, Mettam; builder, Henry Wallace.

Philadelphia.

Factories. — Messrs. S. B. and M. Fleisher are about to build, cor. Twenty-third and Hamilton Sts., main building to be six stories high, 58′ x 180′; office, shipping and engine-room building, 52′ 3″ x 67′; dye-house, 51′ 2″ x 68′ 2″; boiler and drying-house, 31′ 2″ x 38′ 3″.

Building Permits. — *Norris St.*, between Fifteenth and Carlisle Sts., 10 three-st'y dwells.; W. F. Snyder, owner.

Tacony St., e s, s of Bridge St., 2 two-st'y dwells., 17′ x 20′; J. P. Yerkes, contractor.

Chester St., between Forty-seventh and Forty-eighth Sts., 4 three-st'y dwells., 26′ x 45′; Jas. D. Arthur, contractor.

Beach St., No. 1115, two-st'y addition to boat-shop, 30′ x 30′; Geo. Shepherd, owner.

Mifflin St., cor. Swanson St., two-st'y press-building, 31′ x 65′; two-st'y treating-room, 21′ x 31′; one-st'y coopering-house, 25′ x 75′; C. F. Pearce & Co.

North Front St., No. 926, stable, 15′ x 130′; Jno. K. Furman, contractor.

Lehigh Ave., between Richmond and Fisher Sts., 4 two-st'y dwells., one 16′ x 25′, three 14′ x 25′; Samuel Elliott, contractor.

Eleventh St., cor. Berks St., store, 10′ x 40′; Jacob R. Garber, contractor.

Pallas St., cor. Tasker St., three-st'y store and dwell., 15′ x 50′; J. K. McCullen, contractor.

Sepowa St., n of Erie Ave., two-st'y dwell., 14′ x 38′; D. C. Schuler, contractor.

Johnson St., w of Main St., 2 three-st'y dwells., 18′ x 44′; Jno. Snowden, owner.

Market St., No. 1021, five-st'y store, 28′ x 158′; Jacob Myers, contractor.

Fifteenth St., cor. Hamilton St., three-st'y back building to factory, 40′ x 40′; E. S. Matlock, owner.

North Tenth St., No. 661, three-st'y dwell., 15′ x 25′; Martha Snyder, owner.

Sutherland Ave., w s, n of Christian St., boiler-house, 15′ x 32′; J. P. Turley, contractor.

Kensington Ave., No. 2650, three-st'y store and dwell., 18′ x 45′; F. P. Stephens, owner.

South St., between Seventy-second and Seventy-third Sts., two-st'y dwell., 22′ x 54′; Jno. Welsh.

Church St., w of Wood St., second-st'y addition to shop, 20′ x 70′; Ellen Schofield.

Tioga St., n w cor. Lewis St., two-st'y dwell., 18′ x 50′; Jos. Henhoeffer, owner.

Christian St., No. 1708, three-st'y dwell., 18′ x 55′; Jno. McConaghy, contractor.

East Jackson St., No. 706, two-st'y dwell., 15′ x 32′; Jno. Zoelle, contractor.

Weightman's Works, Falls Schuylkill, car-house, 50′ x 59′; Powers & Weightman, owners.

Clearfield St., e of Sixteenth St., second story to shop, 25′ x 50′; H. A. Miller, contractor.

Juniata St., cor. Ruhl St., four-st'y addition to factory, 38′ x 40′; A. M. Green, contractor.

Supplee St., s s, between Fifty-fourth and Fifty-fifth Sts., three st'y factory, 58′ x 112′; N. R. Yewdall.

St. Louis.

Building Permits. — Thirty-nine permits have been issued since our last report, eighteen of which are for unimportant frame houses. Of the rest, those worth $2,500 and over are as follows: —

J. C. Fiuk, three-st'y brick warehouse; cost, $6,000; Kledus, architect; contract sub-let.

A. Bollinger, two-st'y brick dwell.; cost, $3,000; Brady, architect; A. Bollinger, contractor.

Wainwright Brewery Co., two-st'y brick brewery; cost, $139,762; E. Jungenfeld, architect; contract sub-let.

Peter Roemer, two-st'y brick dwell.; cost, $4,000; I. Stock, contractor.

Thomas Thomsen, two-st'y brick dwell.; cost, $3,000; A. Beinke, architect; Remmers & Thomsen, contractors.

St. Louis & San Francisco Railway Co., one-st'y brick roundhouse; cost, $15,000; contract sub-let.

Sam. Marlow, brick dwell.; cost, $3,500; Charles May, architect; P. Riecher, contractor.

General Notes.

Albert Lea, Minn. — The proposition of Freeborn county issuing bonds in the sum of $40,000, for the purpose of building a court-house, will be voted upon at the approaching election.

Bloomfield, Conn. — The Congregational Society has plans drawn for a frame parsonage; cost, $3,000; Palliser, Palliser & Co., architects, Bridgeport.

Bridgeport, Conn. — Two brick school-houses for the city; cost, $34,000; Warren R. Briggs, architect.

District school-house; cost, $2,000; Warren R. Briggs, architect.

House and stable for E. Parmly, Esq.; cost, $15,000; Warren R. Briggs, architect.

The Bridgeport Brass Co. is building a factory, 35′ x 150′, three-st'y brick.

Bucyrus, O. — House and barn for H. W. McDonald; cost, $5,000; Palliser, Palliser & Co., architects, Bridgeport, Conn.

Des Moines, Io. — B. L. Harding will erect an elevator, 60′ x 114′, and 93′ high. It will have a capacity of 500,000 bushels of grain, and will cost $50,000.

Easton, Mass. — The shop to be built by D. B. Closson, will be 35′ x 135′, and four stories.

Elizabeth, N. J. — In answer to the advertisement of the Board of Education recently published in the *American Architect*, seventeen architects sent in plans, and the $150 premium was awarded to Palliser, Palliser & Co., of Bridgeport, Conn., who are now preparing working plans and specifications, and the building is to be started as soon as possible.

Fairhaven, Mass. — Grammar-school building for H. H. Rogers, Esq.; cost, $80,000; W. R. Briggs, architect, Bridgeport, Conn.

Long Branch, N. J. — Philadelphia pressed-brick and terra-cotta store; cost, $10,000; A. L. Hartwell, architect.

Newport, R. I. — A stable, to be built of stone and wood, and to cost about $10,000, is to be built for Mr. F. A. Stout; Mr. H. R. Marshall, of New York, architect.

Southport, Conn. — Barn for John H. Perry, Esq., cost, $3,000; W. R. Briggs, architect, Bridgeport.

Stamford, Conn. — House for F. S. Weston, Esq.; cost, $17,000; W. R. Briggs, architect, Bridgeport.

House for W. C. Harding, Esq.; cost, $20,000; W. R. Briggs, architect, Bridgeport.

Coachman's cottage for Geo. A. Hoyt, Esq.; cost, $2,500; W. R. Briggs, architect, Bridgeport.

Tarrytown, N. Y. — A $14,000 frame dwell. is to be built for Mr. Wm. C. Casey, from designs of Mr. H. R. Marshall, of New York.

Taunton, Mass. — High-school building for the city; cost, $60,000; W. R. Briggs, architect, Bridgeport, Conn.

Weatherly, Pa. — Jos. Cassler, cottage; cost, $2,500; Palliser, Palliser & Co., architects, Bridgeport, Conn.

Yonkers, N. Y. — Dr. Robert Stone is having a large country house built here; cost, $15,000; J. D. Brown, builder; Palliser, Palliser & Co., architects, Bridgeport, Conn.

A frame residence, to cost $18,000, is to be built for Mr. F. N. Bangs, from designs of Mr. H. R. Marshall, of New York.

Bids and Contracts.

Framingham, Mass. — The contract for furnishing piles and timber work for use at Farm Pond has been awarded to George H. Cavanaugh of Boston for $26,551.

Kansas City, Mo. — The following is a synopsis of the bids for slating roofs of public building, opened October 22, 1883: —

Dalton, Bulgert & Co., $1,993.
William Hall & Sons, $2,665.
T. F. & J. A. Hayden, $1,950.
Knisely & Miller, $2,038.

Memphis, Tenn. — The following is a synopsis of the bids for heating apparatus, opened October 22, 1883: —

I. D. Marshbank & Son, $14,152.
S. I. Pope & Co., $24,879.
Thomas E. Basshor & Co., $17,750.
Bartlett, Hayward & Co., $15,400.

Mosquito Inlet, Fla. — The following is an abstract of the bids for building a light-house at Mosquito Inlet, Fla., opened October 16, 1883:

I. P. Morris Company, Philadelphia, metal work, $11,750; wages of mechanics, $5 per day (*accepted*).
Tanner & Delaney Engine Company, Richmond, metal work, $11,950; wages of mechanics, $2.50 and $3 per day.
Phœnix Iron Company, Trenton, N. J., metal work, $15,000; wages of mechanics $3 to $4 per day.
West Point Foundry Association, Cold Spring, N.

The American Architect and Building News

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LINCRUSTA-WALTON.

THERE is perhaps no department of art which requires greater skill and judgment or a more refined taste than that which relates to the internal decoration of a building; and while ornament is not strictly speaking an essential, walls and ceilings look very bare without it. When, however, a decoration is made to blend harmoniously with the general character of a building, it becomes, in fact, one of the greatest essentials imparting those finishing touches which give an intrinsic value to the whole work. The materials at hand for the decoration of interiors are varied enough, but architects have long suffered for the want of a perfect material, something which was not brittle but had enduring qualities, could resist heat, cold and damp, and bear a rough scrubbing with soap and water, in fact, something which should be as permanent as the more substantial parts of the building.

The introduction of the new material called "Lincrusta-Walton" appears to have solved the difficulty, for it possesses all the desired attributes, and when so esteemed an authority as Mr. James Renwick, of New York, pronounces it to be "one of the most valuable materials for architectural and decorative purposes which has ever been invented," we may be assured that architects will consult their interests by making themselves well acquainted with its merits.

In the first instance in Lincrusta-Walton we have for a base, a material which is indestructible and imperishable, which will stand all rough usage short of wilful destruction. It is also water-proof and can be washed and scrubbed without risk of damage; lastly, we have in Lincrusta-Walton the designs in solid relief, which in moderation may represent the most delicate line-work, or again, in high relief to any extent, when it cannot be distinguished from the finest hand-work of the most skilful wood-carvers.

It will be seen at a glance that such a material in the hands of an intelligent architect presents facilities for the decoration of interiors such as never existed before, and in future he will not be excused for inflicting flat designs and naked walls on his clients, when all the infinitely various and charming effects of solid raised designs will be at his command without additional outlay.

The practical question of cost can be answered satisfactorily. The finest designs in Lincrusta-Walton can be purchased for less price per yard than the higher grades of wall-paper, and taking into consideration the enduring qualities of the former material, and bearing in mind that it can be removed from one building to another, the economy of its use cannot be questioned.

The sanitary character of Lincrusta-Walton has attracted much attention both in Europe and the United States, for being water-proof, it is impervious to damp, cold or moisture of any kind; it is also a non-absorbent, and little affected by temperature. Thus, while the health of the inmates of a house is preserved, the owner's most valued possessions are safe. Pianos, pictures and works of art can be placed in any position with safety, the Lincrusta forming a rich but unobtrusive background, especially suitable for such objects. Of the use of Lincrusta as an external decoration we will speak on another occasion, briefly stating now that its application in this respect has met with success; it will supply a cheap water-proof shield to wood, iron and other materials, and afford a lasting and beautiful ornament to the structure. The designs of Lincrusta-Walton are all of a high order of art, and sufficiently varied to meet the requirement of all styles and tastes, and for important works the architect can have his own designs executed in this material. Models of thousands of art objects have just been received from Italy, which will be reproduced in Lincrusta-Walton, and will prove highly valuable for decorative purposes. We must not omit to state that Lincrusta-Walton will bear an embellishment in oil-colors, and when gilded has all the appearance of solid metal in relief.

The ladies' dining-room at Delmonico's, Fifth Avenue, New York, recently decorated in Lincrusta-Walton, is pronounced by art critics to be one of the finest specimens of decoration in this country, especially the ceiling, which is admitted to be a work of art of the highest order. This material, from its cheapness, is equally applicable to the homes of the people, or the cottage *ornée*, while for public halls, offices, etc., it has an inestimable value.

We feel that we have barely done justice to the subject, but for those who desire to know more, we refer to a pamphlet in which the matter is treated in greater detail: this can be had of

MESSRS. FR. BECK & CO., NEW YORK,
Sole Agents for the United States.

CARPETS AND RUGS.

IN these days of art feeling and art impulse, the work of the architect, decorator and furnisher goes hand in hand. Harmony is the first requisite for a well-appointed house, and all things which go towards its perfect completeness show a mutual interdependence, consequently, neither artisan can ever work without regard to the others, but the work of each must be done with special reference to the work of the rest, and all must be governed by the architect, whose plans are not brought to perfect fulfilment until the house stands furnished and adorned, its furnishings and adornments selected with reference to the style of building.

One of the most important parts of the furnisher's work is the proper selection of floor coverings, whether they take the form of carpets or rugs, as the carpet, with walls and ceilings must serve as a background against which to display the beauty of the furniture and the fine artistic harmonies of pictures and ornaments. In more expensive houses the floors are inlaid or finished plainly in handsome hard-woods, and naturally rugs rather than carpets are used, or if carpets they are made in the manner of rugs, with handsome borders, and put down so as to have the wood-work about the edge of the room exposed. This is frequently done when only the edge of the room has a hard-wood finish, the remainder of the floor which the carpet rug covers being nicely laid, but with common wood. These carpets are not to be nailed down, but attached by small brass rings to gilt-headed nails driven into the floor. In this way they are easily taken up and shaken, and thus are kept free from dust, which seems to be the chief objection to the carpet itself.

Since fashion aided by good sense and fine taste has introduced the finished floors there has been an increased demand for rugs, so that now they form a regular feature of the carpet-dealer's stock. Probably no house has more fully met the fashionable demand than John H. Pray, Sons & Company, who have been at no little pains to procure a large variety of styles at equally varied prices to suit all persons. A few years ago rugs were rare and consequently expensive, but as usually happens the demand created the supply, and now it need not necessarily take a long purse to make one the owner of two or three very pretty rugs. Of course they will not be veritable antiques, for those are expensive and always will be so long as it is possible to procure them. Naturally they are growing rare, for Europe and America have ransacked the East in search of these treasures until they have exhausted it. A new fancy—but it takes money to indulge it—is to find the long antique rugs, known as "gallery rugs," and use them for hall and stairs. Two long rugs, with the addition of a large rug of similar color and design will be all that will be found necessary, and the stairway will be a "joy forever." The antique rugs are the first

choice of those who can afford them, and after them the real Indian, Persian and Turkey rugs of fine grades and more modern manufacture; but the European rugs demand attention, both from their elegance of texture, and their fine following of the Oriental in color and design. Most prominent among these European rugs are those known as Saxony carpets, which come in a size large enough to nearly cover a library or dining-room of the usual dimensions, and from that to the smallest hall or fireplace rug. These rugs have a heavy, thick, velvety pile, and they will outwear two generations of people, and be in good condition then; the centres are in plain colors, in red, Indian blue, "old gold" and olive, and the wide borders are in imitation of the Persian rugs. One charm of these Saxony rugs is their soft color; they have none of the hardness and assertiveness of the new, but the tones are blended and softened until they have a sheen like velvet. They were the first European rugs imported that followed the Oriental in style or color, and they have been wonderfully successful. A later imitation, and a remarkably fine one, has been made by Templeton & Company, of Glasgow, Scotland. These Scotch rugs, as they are called, are in texture like the Axminster carpets, and in design they follow all the various antique Oriental rugs, the Indian, Persian and Turkish. They are very beautiful and durable; they have all the features of the Oriental carpets, and are much less expensive. Great care has been exercised in the selections of the designs, and only the best in every sense has been followed. They have taken a great hold on the popular fancy, and are used to a great extent, as well they may be, for there has nothing been shown of better value than they.

Last in the list of European rugs come the "Kensington Art Squares," or as they are called by some, the Woodstock carpets. These are of fine Kidderminster, in artistic designs and colors, and are within the reach of a very moderate purse. The most desirable colors are Indian blue and red, bronze, olive, "old gold" and Japanese blue. Usually, only one color in two tones is shown in the carpets, although in some cases brown and "old gold" are seen in the same rug. The designs are largely conventional, being mostly the genuine Morris designs, and the carpets are artistic and in perfect accordance with the prevailing art feeling. The readiness with which these carpets are taken up by all buyers is unprecedented; there has been nothing in the history of carpets and furnishing which exceeds, or even equals it. It is a proof that people are becoming educated in art, and that the present movement is felt outside the moneyed circle.

Carpets themselves have felt the influence, and, in place of the glaring monstrosities which were formerly such a delight to the average housekeeper, show the very loveliest effects in color, and the most chaste and elegant designs. Low, soft tones prevail, and the colors most seen are those known as "rug colors." Even the designs are followed, and the results are very satisfactory and beautiful. The French Moquette carpets, with their light grounds and gay figures are not in present favor, but in place of these are the superb Axminsters, and afterwards in order, the Wiltons and Brussels. The same designs are found in all these grades of carpets, and even the modest ingrains show the Brussels effects. Last year there was a frantic attempt made to give prominence and popularity to yellow in the carpets, but the effort was happily unsuccessful, and the approving seal of taste and fashion is set again and more firmly on the soft and subdued Indian tints. It will be seen that artistic furnishings, so far at least as carpets are concerned, does not depend so much upon the means at one's command as upon a cultivated taste and a genuine desire to make the best possible effects. One may pay $1,000 dollars for a carpeting, or he may pay $18; in either case he may have something purely artistic, if his taste be good, or if he have some one to help him to a wise selection.

J. H. PRAY, SONS & CO.,
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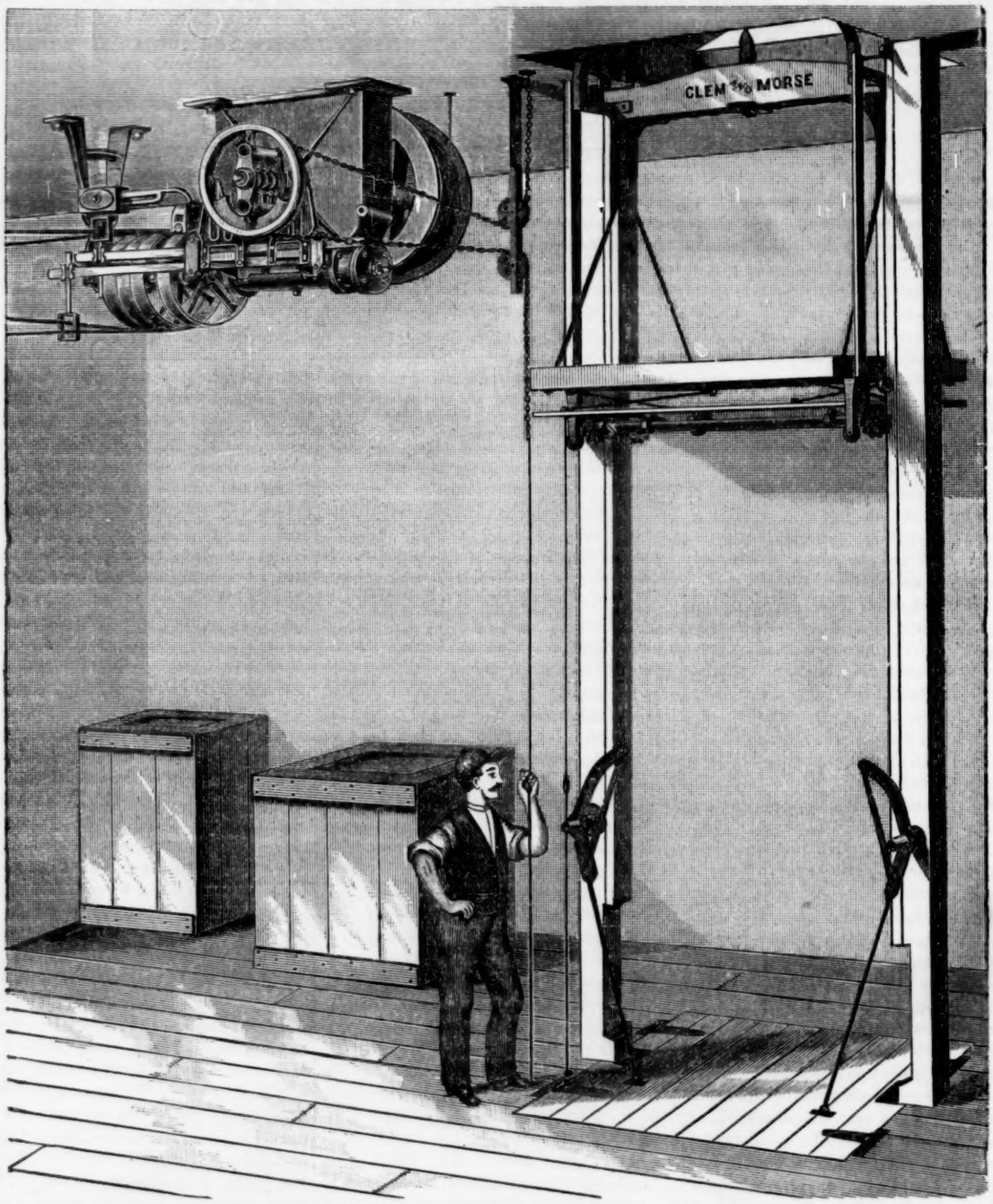

CLEM & MORSE'S SAFETY ELEVATOR ATTACHMENTS.

The illustration which accompanies this article represents a new form of safety attachment for an elevator which will guard against

all accidents arising from the too sudden dropping of the car, either by the running away of the machinery, breaking of the rope, or other similar accidents.

The mechanism by which the platform is stopped in case the rope breaks or an excessive speed is reached, consists of a pair of toothed cams which are partly rotated, so as to engage in the wooden sides of the guides, and hold the platform at any point. These are operated by bell-cranks, attached to what may be called a table. This table is nearly the whole size of the elevator platform, and is made of one-half inch poplar. It is supported on straight steel rods, attached to the outer edges. The springs are so adjusted that the table is practically without weight, and may be said to float in the air beneath the platform. If this table be raised, even a short distance, the cogged cams are, by means of the bell-cranks, turned so that their teeth catch the guide-posts, and the downward motion of the platform itself forces them in until the motion is entirely arrested. In case the rope breaks or the platform starts downward at a speed above that for which the apparatus is set, the pressure of the air on the floating table forces it upward and the teeth engage, and the main platform is stopped within a space so small that it is scarcely worth measuring.

We have heard of experiments with the apparatus where care was taken to measure the actual distance of the fall, and it was said that the car was arrested within one-fourth inch of the point it occupied when the rope was cut. Whether the car be loaded or empty the effect is the same, the teeth taking hold exactly in proportion to the weight of the platform. By adjusting the straight springs which hold the floating table in position, provision may be made for running the elevator at any desired speed, or for tripping the gripping mechanism when any given speed has been exceeded. In our own establishment the vertical guides are lined on each side with heavy strips of ash. In the experiments which we have noticed the teeth usually scored the ash for an inconsiderable depth. Of course, with a heavy weight they would be pressed in perhaps one-eighth inch or more.

The cams on both sides of the car are on one shaft, and near the centre are the rock-shaft attachments for turning them. It would seem that it actually provides a device by which safety may be assured, and if attached to a car would prevent injury not only by actual breakage of a rope, but would prevent those accidents which sometimes take place where the winding machinery gives way, allowing the car to fall, and yet the rope on the drum keeps up a sufficient tension to prevent the gripping devices from acting. It would obviate danger where the governor rope breaks or fails to act. We apply it not only to ordinary freight, but also to passenger, elevators of all descriptions. It does not require any considerable alteration of either elevator or guides, the only requirement being that there should be sufficient clearance to enable the toothed cams to get a bearing on the edges of the wooden guides.

The automatic hatch-doors attached to these elevators combine advantages of the most marked kind, while escaping many of the inconveniences of the ordinary forms.

The first of the improvements to be noticed is the improved automatic door-joint. It consists of so arranging the joint or hinge on which the door is hung, and the breaks in the guide-timber that the door, in rising, makes the guide continuous from top to bottom without break, and at the same time enables the door to close without leaving any opening at the back. The post at the bottom of the recess that receives the door is cut away, so that any dirt or obstruction may naturally roll out, and in doing so if it falls upon the door itself, will, as the door rises, roll off and escape below without jamming. A door hung in the ordinary manner leaves a break of several inches in the guide-strip when it is raised into a vertical position, and the guide of the elevator car is very likely to be caught in this opening, and sometimes serious accidents occur in this way, a general smash-up usually resulting when this happens, and even if catching does not take place there is generally a very unpleasant jar as the car passes the guide.

The guide-strip extends several inches above the floor before it is cut out to receive the door, and as it is cut on a bevel, and the guide on the under side of the door on a similar bevel, the joint which is formed is very perfect. This opening at the back of the door while it is rising prevents, as we have said, a bit of coal or other rubbish from keeping the door from going flatly back into its place. With the old style of doors, when this happens, the descending car is often caught and held up long enough to allow the cables to slacken and snarl up by uncoiling from the drum. The second improvement consists in making the lever by which the door is opened in two parts, which are pivoted at the centre. These are connected by two slotted rods, which are clamped together by set-screws. By simply loosening these screws and lengthening or shortening the bar the angle of the bow can be changed in reference to the connecting-rod. This enables the force through which the door is held back in place to be perfectly regulated, and in case of a settling of the floors, shrinkage of the wood-work, or change in the relationship of the parts, the door can be quickly adjusted to keep its place perfectly while the car is passing up and down. Those who are familiar with the constant movement found in even well-constructed warehouses will at once see the advantage of a movable arm in this position, as it enables the doors to be kept in perfect adjustment, without the necessity of taking off the door and rod, and sending the bow to a blacksmith to have it drawn out or shortened, as is necessary with doors which do not have this improvement. It is applicable in a great variety of situations, and seems to do away with a multitude of objections which have heretofore been urged against automatic work for hatchway doors.

The belt-shifting apparatus is automatic in its action, stopping the machine when the platform reaches its highest and lowest point of travel, and by simply moving the rubber-cushion stops that are bolted to the shifting bars, it can be made to shift three, four or five inch belts. The machine is operated by straight and cross belts, and only the one required is moved when shifted on or off. The brake acts on a separate pulley, and adjusts itself by gravity as the leather wears down on the face of the brake-shoe. The simplicity of its construction enables parties in remote sections to erect their elevators without the expense of having an experienced man sent out by the manufacturers.

The Albro-Hindley screw-gearing used in these elevators is cut very accurately on special machines built for the purpose, and the principle is such that the worm or screw has a full bearing on every thread, which gives increased strength, lessens the friction by distributing pressure over a larger bearing surface, which enables better lubrication, and gives the elevator a smoothness of motion impossible to obtain with the straight screw.

CLEM & MORSE,
411 and 413 CHERRY ST., PHILADELPHIA, PA.

THE GUENTHER WAGNER WATER COLORS.

THESE colors have lately been introduced to this country with an unprecedented success by Professor Johannes Roeloffs, Importer of Illustrative Educational Material and General Agent of Guenther Wagner for the United States of America. For more than twenty years the excellent qualities of these colors have been generally acknowledged by the German artists and by the highest technical authorities in Germany, Austria, Switzerland and Italy, and they have been awarded "honorable diplomas" and ten gold medals, including the first-prize Grand Gold Medal at the Exposition of Vienna over all other manufacturers of water colors. Their use is now obligatory in the polytechnic universities of said countries, also in the military colleges, and in the colleges and schools of all grades in the cities and principal towns of the German Empire. Professor Roeloffs after submitting the Wagner colors to the judgment of the leading artists *in this city* has been favored with the following and many other testimonials.

NEW YORK, June 7, 1883.

I have tested the Guenther Wagner Water Colors, and find that the same are equal, if not superior to any ordinarily used. The collection of tints arranged especially for the use of architects and engineers has the additional merit of supplying the draughtsman with fixed colors for the various materials used in a structure, and thereby securing a uniformity and accuracy of design, which it is difficult to obtain otherwise.

(signed) H. J. SCHWARZMANN.
Architect, Tribune Building.

J. MARSCHING & CO.,
27 PARK PLACE, NEW YORK.