

THE AMERICAN ARCHITECT AND BUILDING NEWS.

VOL. XV.

Copyright, 1884, JAMES R. OSGOOD & Co., Boston, Mass.

No. 427.

MARCH 1, 1884.

Entered at the Post-Office at Boston as second-class matter.

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THE public-spirited architects of Minneapolis, who have been interesting themselves, as befitted persons better qualified to judge of the matter than any one else, in securing the passage of a building ordinance for that city, seem to have awakened some rather singular opposition. One member of the city government, in particular, according to the *Pioneer Press*, undertook not long ago to explain to his fellow-members the reasons for objecting to the proposed law. According to this enlightened official, the ordinance "appears to have been drawn for the special benefit of the architects, and the man who proposes to erect a building and pay the cost really has no choice in the matter, but must build as some architect dictates, and not according to his own means and individual judgment." This, in general, is only a repetition of a stale slander regarding architects, much in vogue among those who never employ them; but in its particular application to the present case it contains an unintended compliment to the promoters of the new ordinance, by acknowledging that, if it should become a law, the man who wishes to build in Minneapolis will be compelled to do so, not "according to his own means and individual judgment," or, in other words, according to his own ignorant caprice and reckless avarice, but in conformity with prudent and reasonable regulations. The objecting councilman discovered another grievance in the fact that under the proposed ordinance, as he said, "no man can build even a wood-shed in the central portion of the city without asking an architect for permission and plans and specifications." We can hardly credit the assertion that the new law proposes to make the consent of a professional architect a necessary preliminary to the construction of a wood-shed; but in regard to the other part of the complaint, that owners will be compelled to employ architects whether they wish to or not, we can reassure the official and his friends by observing that in New York, where the law is substantially the same in requiring the submission of plans and specifications under the name of an architect, any person may figure as an architect, and in point of fact the owner or the carpenter very often acts in that capacity so far as to sign his name to the application.

AFTER describing, at some length, his apprehensions as to the conduct of the "autocratic architects," all of which appear to us quite as devoid of foundation as the one we have just mentioned, the honorable gentleman proceeded to bewail the "absence of all just consideration for the men who build and add to the taxable valuation of the city" evinced by a law which "places all the power and discretion in building enterprises in the hands of those who do not pay one cent of the cost either directly or indirectly." It might be suggested that the placing of the supervision of building operations in the hands of those who do not pay for them, and are not, therefore, tempted to carry them on with dangerous parsimony, is exactly the object for which building laws are made, but this will be sufficiently obvious without comment. The last complaint of the official, that "extra expense will inevitably be imposed" under the provisions of the enactment, while the structures to be erected in accordance with them will be "not a whit better

than those which have been built in Minneapolis during the past three years," these being, in the speaker's opinion, "strong enough and substantial enough for any city," lost a little of its force through the remark of one of the audience that two of the "strong and substantial" structures erected under the beneficent operation of the present system fell down a little while ago, but the alderman explained without hesitation that these mishaps were "directly attributable to the action of frost upon brick walls in which the mortar has been laid during the cold of Minnesota winters." In his opinion, "it would not be just to hold any architect or other man responsible for the collapse of the two buildings referred to," and the accidents, indeed, only showed "that a building is not necessarily permanent or enduring because it has received the approval stipulated in this ordinance." We should like to know whether architects and builders in Minneapolis permit themselves no discretion as to the sort of weather in which brick walls shall be built. In less "progressive" towns, such as New York, if the builder is not prudent enough, or the architect not careful enough, to stop the laying of brick during "Minnesota frosts," the deputy inspector will assume the responsibility of terminating the operations. Why the same method of control should not be adopted in the great Northwestern cities, where some such protection against recklessness or ignorance is, by the honorable alderman's own showing, urgently needed, and accidents attributable to such causes be thereby rendered impossible, is hardly clear.

THE preposterous project for the establishment of a "metropolitan" system of sewerage for the towns and villages within a radius of fifteen miles of Boston has come up again before the Massachusetts Legislature. As we have before described it, leaving out of consideration the amendment suggested by one enthusiast, who wants the scheme which seems to him so brilliant extended to take in the city of Worcester, forty-five miles away, the proposition submitted by the State Board of Health contemplates the forcible construction of vast intercepting sewers running parallel with the course of the Charles and Mystic Rivers, which drain into the estuary which forms the harbor of Boston. The purpose of these intercepting sewers is supposed to be the prevention of the pollution of those rivers by the drainage from the towns along the banks, and the estimated cost is thirteen millions of dollars. To observe the calmness with which those who assist at the discussions upon the subject speak of this enormous sum, the largest, if we are not mistaken, which was ever devoted to a single work of sewerage engineering, one would suppose that the inhabitants of Boston must be groaning under a pestilence of zymotic diseases bred from the floods of filth poured down upon them from the sewers of Newton, Watertown, Belmont and Weston; and it is with amazement that we learn that only one of the towns included in the "Metropolitan district" possesses any sewers at all, or has any prospect of possessing any; so that the "Metropolitan intercepting sewers" will intercept nothing, and will confer upon the inhabitants of Boston no benefit whatever that could not be equally well secured by hiring a man with a cart to make a weekly tour among the proprietors of the hovels which actually overhang the river banks.

AT a rough guess, the present population of the towns which are expected to contribute thirteen million dollars for building tunnels to intercept their imaginary sewage is about one hundred and fifty thousand, so that the average contribution which the peaceful farmers of Weston, or the villagers of Newton will be called upon to make for preventing the sewage from their estates, not one of which is within five miles of a sewer, from reaching the city of Boston, is about four hundred and thirty-three dollars. Whether the whole amount is assessed at once, or the property of the citizens mortgaged for it, the effect would be the same, to drive the entire population of the region supposed to be drained in that way to some place where common sense ruled the appropriation of private funds for public purposes. The state of mind which prevails at present with regard to health and sanitation is so feverish and unreasoning that it is difficult to persuade any one to weigh calmly the benefits to be derived from any enterprise of sewerage which assumes a grandiose name; but we may, perhaps, illustrate the folly of the Metropolitan scheme by com-

paring it with a measure which we will suppose to be introduced into the United States Congress, requiring all the towns along the banks of the Charles and Mystic Rivers to build forthwith at their own expense custom-houses, to cost at least a million dollars each, for the benefit of their foreign trade. Every argument in favor of the Metropolitan intercepting sewers is equally valid in regard to the million-dollar custom-houses. The villages of Waltham and Weston have no foreign trade, nor can even a dory reach them from the sea; but neither have they any pretense at sewers, and the expense of dredging out the stream, so as to bring foreign ships to the doors of their custom-houses, would be less than that of providing channels to get their drainage into the intercepting tunnels which they are now asked to pay for. No one can deny that Weston or Wellesley, which now furnish a peaceful rural home to a sparse population, would find their prosperity, and that of their metropolis, Boston, quite as much promoted by their conversion into busy seaports as by the possession of a complete sewerage system, and if it is desirable to build the most costly and useless part of a questionable sewerage system first, it is equally important to get the Belmont and Anburndale custom-houses under way at once, so as to have them ready when navigation is extended to those places.

THE case which excited so much attention a year and a half ago in which a New York gentleman, who was compelled to pay the landlord of the hotel in which he was staying twenty-five hundred dollars to prevent his wife, ill from typhoid fever contracted in the hotel, from being thrust out of doors, sued to recover the money, as having been extorted from him by force, has just been tried. The testimony, which was taken some time ago, was anything but favorable to the landlord, but the jury could not agree, after five or six hours' deliberation, as to whether he ought to pay back the money or not. Whether the case will be tried again remains to be seen, but we hope that the matter will not be allowed to drop. If it is to be lawful for American hotel-keepers at intervals to fall upon their guests and torture them until they pay an enormous ransom, the rest of the world ought to know it.

THE project for a metropolitan railway in Paris seems to have made little progress within the last five months. To quote the words of *La Semaine des Constructeurs*, the discussion has shown plainly what sort of roads are unsuited to the circumstances, but has not produced any suggestion of better modes. The streets which the new viaduct is intended to relieve being already overcrowded with traffic, the establishment of an elevated railway through them, with its foundation of piers or posts, would obstruct the circulation so seriously that such an expedient is hardly to be thought of, and an elevated road through the open spaces in the rear of the houses would require the expenditure of an immense sum for purchasing the right of way through private property. The opening of new streets, parallel with the present crowded thoroughfares, would be also a very costly expedient. The only place where the right of way can be had for nothing seems to be the subterranean region lying beneath the streets, but, aside from the expense of tunnelling, and of underpinning and strengthening the foundations of the adjoining buildings, the dislike of the Parisians to darkness and dampness is so fixed that no one dares to predict financial success for an underground line. Moreover, the need seems, according to *La Semaine*, to be rather for increased carriage-room than for foot-ways, the sidewalks in the most crowded streets being generally quite unincumbered while the middle portion is constantly blocked with vehicles.

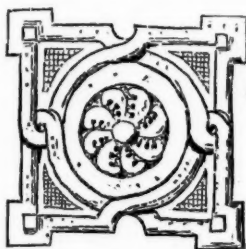
TO the American mind this circumstance would be unimportant, since the prime object of a city viaduct, either above or below ground, is to transport passengers quickly to their destination, without regard to the question whether or not they would have room enough on the sidewalk to walk there; but it is altogether likely that an elevated or subterranean road, by providing a rapid and convenient mode of travelling, would not only relieve the sidewalks, so as to allow of their being made narrower, if necessary, for the benefit of the street between them, but would tend somewhat to diminish the number of carriages and omnibuses pursuing the same routes. In regard

to the obstruction which would be caused to the passage of vehicles by the posts of an elevated railway, it is at least worth suggesting that for less than the cost of underpinning the foundations of the neighboring houses for a subterranean road it might be possible either to place pilasters against the face of the party walls of the houses themselves, or to use these party walls as piers, sustaining upon them steel trusses which would span the streets from house to house, and sustain in their turn the longitudinal trusses carrying the roadway. A structure of this kind would not interfere in the least with the movement of foot passengers or vehicles through the street, and, if stations for the piers or pilasters could be found conveniently near each other, and on opposite sides of the street, the spans need not be very great, nor the trusses very cumbrous, to give all the strength required.

IN connection with the great Hungarian National Exhibition, to be held at Buda-Pesth in 1885, it has been decided to form a limited international exhibition, including only tools, implements and machinery for agriculturists and artisans, and particularly the motors applicable to such machinery. In the words of the Commission which has charge of the matter, the improved means of communication between Hungary and the rest of the world have exposed the country to the competition of the advanced foreign industries, and have, moreover, developed in Hungary itself a tendency toward the concentration of capital and division of labor which prevails in other countries. The Commission, therefore, believing that it is of great importance to save the smaller industries from extinction, and to preserve the practice of those technical arts which great manufacturing, devoted to cheapness of production, and without individuality of character, entirely neglect, has developed the novel idea that ingenious craftsmen, working at home on their own designs, might, if supplied with modified forms of the motors and labor-saving appliances of the great factories, compete successfully with them in production, much to the advantage of their own character and independence. Whether the motor required is yet in the market is perhaps doubtful, but among the various gas, water and steam engines on a small scale now in use, to say nothing of electric motors, it seems quite possible that a form could be chosen worthy, after modification, of adoption for such purposes. Although the value of domestic machinery as an agent in social science has not before been discussed, so far as we know, there are several examples which go to show the soundness of the position held by the Commission. Every one, for instance, has observed the benefit which the sewing-machine has brought to the community, cheapening production, not to a few rich manufacturers, but to a large portion of the families of the civilized world, and increasing their comfort and happiness to a very appreciable extent. Among appliances of another sort, the little machine for embroidering the so-called Hamburg edging, which is now in use in hundreds of Swiss houses, by enabling its humble proprietors to furnish their productions at a very cheap rate, has opened for them a market extending to the ends of the world, and has brought them an increase of income all the more precious for having been earned with the help of individual thought and taste.

ACCORDING to the *Scientific American*, a new petroleum well has been sunk in the Baku district, near the Caspian Sea, which for five months has been spouting oil in a jet three hundred feet high, at the rate of two million gallons a day. Soon after the opening of this well another, near by, which had been flowing steadily for nine years began to spout oil at the rate of about two hundred and fifty thousand gallons a day. The amount of petroleum derived from these wells was far greater than could be collected, and it was allowed to waste into the sea. It is said that the price of the crude oil fell to seven cents a ton, or about seventy-five gallons for a cent, and one of the largest refining firms in the district, which owned fourteen spouting wells, closed them all, and bought the oil which the proprietors of the other wells were throwing away for lack of purchasers. It is well known that the production and refining of oil in the Baku region has of late years become a great industry, supplying the markets of all Southeastern Europe. With the development of its resources which seems likely to come before long, the Russian oil is likely to take the place of the American in many more of the districts which now consume immense quantities of that product.

A RUN TO ROUEN.



SKETCHING—STOOL, a book and block, with plenty of plumbago and rubber, a small strap-sack, and a Yankee. Multiply by two, and the result may be set down as the impedimenta that occupied a compartment one bright June morning. The train rolls lazily along in just that self-satisfied manner everywhere noticeable in France, which seems to imply that it makes no difference when you arrive, and causes the typical

Yankee to actually perspire with impatience; so slowly, however, that you do not fail to see every peculiarity of the country through which you are passing. It is interesting, too, to a stranger, and affords glimpses of peculiar hedge-rows, bits of ruins, or groups of odd bits of domestic architecture, that often look like a handful of dormers, projections, roofs, turrets and chimneys, all thrown together into a kind of architectural *pot-pourri*. All along the road, too, are the picturesque thatched cottages, in which you imagine the occupants sitting between the drops of rain, or setting pails and pans to catch the drippings, and you mentally wonder what your countrymen would say if you should suggest such a mode of roofing on your return.

Such reveries are broken constantly by one's passage through tunnels, and after a rather tiresome trip, made so by the slow progress, we arrive at Rouen. Here we witnessed a ludicrous incident which I suppose is of daily occurrence, and shows the value of a knowledge of the languages. We had stepped inside the waiting-room to inquire concerning a train, when a pompous Englishman with wife and child stepped to the ticket-office:—

"Three tickets to Paris!"

"First-class tickets, Monsieur?"

"Three tickets, yes, three!" (holding up three fingers and not comprehending the question.)

"Ah, yes, third-class. There they are, Monsieur!"

He takes up the tickets, and marches triumphantly to the collector with bag and bundle. "See, wife," says he, "we don't really need their blasted French; can get along well enough without it."

Presenting the tickets, they are punched and he is pointed to the third-class compartment, filled with workmen in blouses, and peasants with baskets. He looks around disgusted, takes down his glass eye, and turns back to the better looking first-class compartment, but is stopped by the collector.

"No, Monsieur, there is your third-class compartment" (pointing to the third-class).

"Paris, yes, sir, Paris, I want to go to Paris."

"No, Monsieur, you hold third-class tickets."

"That's all right, old fellow, they are my wife and children, don't you know!"

"Ah no, Monsieur, they are third-class," (gently pushing him toward the peasants, baskets and wooden sabots in the third-class.)

Then commenced a little dissertation, which for strength of utterance was remarkable, in which "d—n" figured largely, while the enraged Briton vainly endeavored to understand his fault, until helped out by a fellow traveller, who saw his dilemma.

You smile at this? Very well, remember that you yourself have just left England, crossed the Channel, and are now supposed to be a Frenchman in good and regular standing, and are soon obliged to draw upon your boarding-school French, which is no sooner done, than you find it an extremely harrowing operation to the French waiter, and simply exasperating to yourself. The idea of a *garçon* bringing you a glass of beer, instead of butter, for which you asked! You tell him he is pig-headed, and that you are not that kind of a fellow, but he doesn't understand you, and goes off apparently pleased, while contrary to your long established temperance habits, you are obliged to get upon the outside of the beer and go without the butter. These little incidents, however, prove both interesting, instructive and exhilarating, and before long you are ready for a hunt through this quaint old city.

One can never forget the impressions of thus being transported in a day from his native English, to his questionable French; from common scenes to this city which perhaps has not its equal in France, as regards the venerable aspects of both civil and ecclesiastical architecture, and further, where the change is so clearly shown



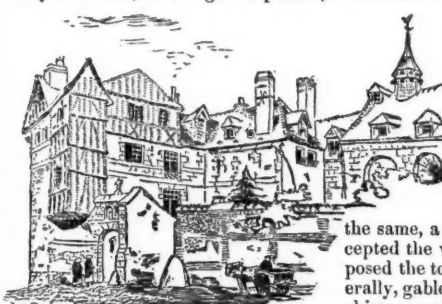
in the dress of the fair Juliets, with their peculiar head-gear, or the men who seem to represent Bruin in the guise of humanity, as in the outskirts of this town. The artist at once turns off from the "main street," and is soon lost in a labyrinth of smaller ones, far more interesting. Coming to an open square, let us spread our stools, and sketch that old bit yonder, which looks as if an earthquake had visited it, or a contrary mule had given it a playful kick. Look at the slated balconies, facing on what was once an inside courtyard; they are on each story, and form an interesting feature, while below seems to be a veritable American hot-house, of which



the boys have made a target. Open-timber-work, too, shows to advantage, and above all are two beautiful old dormers in slate-work, while in the background looms up the Cathedral tower, its sombre mass forming picturesque sky-lines.

While we have been thus sketching, a crowd of urchins have collected, and look on with wondering eyes, chattering all the time, possibly making suggestions, or wondering what earthly use we can make of such a tumble-down old rack. Observing thus, the sketch is soon a part of our books, the show is over, and they and we pass along.

A noticeable thing is the method of laying up a rough brick or heavy stud wall, covering with plaster, and then bedding single slate

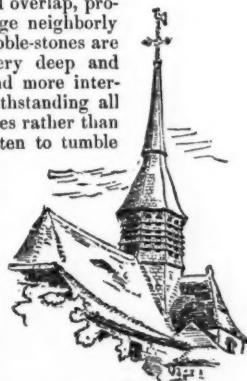


over-lapping each other and forming slate architraves or cross-beams. An old convent showed this feature particularly, and going around to the rear of

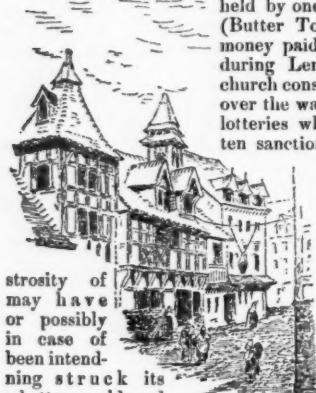
the same, a high wall intercepted the view, but left exposed the tops of things generally, gable after gable and chimney after chimney shooting up, with here and there a turret. What this high wall was for we couldn't imagine, unless to keep away adventurous knights, possibly in the form of the numerous army officers or soldiery, who, when arrayed in their gorgeous uniforms, would vie with the fairest Romeo who ever shinned a walled balcony or thrummed the legendary guitar.

From one point of view a couple of beautiful old spires came in view, which were full worth the tramp that was necessary to find them—a tramp that carried us into one of those little centres of narrow streets, where the houses lap and overlap, project and project, evidently to encourage neighborly feelings across the way; where the cobble-stones are very smooth, and the interstices very deep and muddy, and where you are sure to find more interstices than cobble-stones. But notwithstanding all this, you would have walked many miles rather than miss these old buildings, which threaten to tumble down every minute and yet never do tumble, until the hand of civilization clears them away and rears in their stead blocks of houses, white, stiff, and uninteresting.

Working in and out, you come soon to the Place de la Pucelle, historically interesting, since it is said that Joan of Arc was burned here as a sorceress in 1431. Such a halo of romance has been cast around this figure that you ask yourself, perhaps, where is any monument that might mark the fate of the heroic girl? I will not even sketch it, but there it is, a contemptible modern statue on a still more contemptible pump. According to historic account in Rouen, the cruelty with which this girl was treated is a disgrace to France: subjected to insult, treachery and outrage, bullied by inhuman judges, the poor girl was eventually betrayed by her own countrymen. Even Charles VII, her king, for whom she had fought, and who certainly owed much of his success to her enthusiasm, appears to have totally ignored the heroine of Orleans, and never lifted his finger in her defence. Some say this piece of barbarism was never committed; authentic history, as written in Rouen itself, says it was, and fully describes it. Who shall say?



Not far from here you see the Cathedral, and so turn in that direction. Before you rise the towers, rusty and ragged, the very picture of age. Your eye, however, is particularly held by one of them, the Tour de Beurre (Butter Tower), which was built with money paid for indulgences to eat butter during Lent, a strange commentary on church consistency, which carries our minds over the water, to the festive grab-bag and lotteries which the modern church so often sanctions in order to raise money.



strosity of may have or possibly in case of been intending struck its a better world, and that difficulty a second time by forming thus an ornamental lightning-rod; at least it looks like this. Entering, we are surprised and awed by the immensity and simplicity of the interior. The nave rises ninety feet from the pavement, and stretches away four hundred and thirty-five feet, the work being essentially of the thirteenth century. The walls are ornamented by numerous chapels devoted to the faithful. The master-stroke of several knights, among them Richard Cœur de Lion, seems to have been to ascend to glory through the vivisection plan, bequeathing their lion hearts encased in lead to the church, and the grosser parts of their anatomy to still another town. Quite an economical plan, it would appear.

Cardinal George d'Amboise and his brother enjoy a most magnificent Renaissance structure, with pilasters and panels adorned with

Verily the old priests formed in this case a most efficient committee on ways and means. But there in the background is the spire over the crossing, a kind of nightmare, a mon-iron corkscrew-work, which been intended for a light-house, an escape by way of the clouds flood, but never could have ed for a church tower. Light-predecessor and carried it to the builders thought to obviate the building's thought to obviate



arabesques; but, like many others, their remains suffered during the Revolution of 1793, and their ashes were strewn to the winds. On the left is still another noted tomb, that of the husband of Diane de Poitiers, said to have been the work of Jean Goujon, a fact doubtful, however, from its style.

Much more interesting to the architect, however, are the details of the church itself, the immense rose-windows, and the doorways on



DOOR OF SACRISTY, ROUEN CATHEDRAL

the north and south, ornamented with bas-reliefs, one with the Creation and Judgment, the other with a mixture of questionables. My chum suggests that having paid our money we may take our choice, and either call them scenes from the life of Joseph, his descent into the pit, or a corn-merchant suffering for using false measures, or, again, the hanging of Pharaoh's chief baker.

Passing out through these doorways, we hurry on to St. Ouen, which was commenced in 1318, and surpasses the Cathedral, both in size, purity and masterly execution. Very interesting historically is this church also. Here the Huguenots, in 1562, with a spirit of deviltry born of the hotter regions, built three huge bonfires, in order to burn the stalls, pulpit and organ, which piece of pleasantry nearly destroyed the whole building.

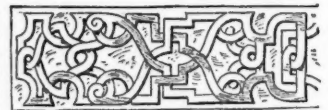
Here, too, the Republicans set up an armorer's shop, built their forge fires, and so completely smoked the interior that it was impossible to look through the glass. Here again transpired a tragedy. The master-mason had set his young apprentice to work upon that beautiful north-transept rose-window, while he himself executed that in the

south transept. Apprentice, however, excelled master, which so enraged the latter that he threw the young fellow from the scaffold and murdered him out of sheer envy. Nearly all the marks of destruction, however, have passed away or been covered, and we can scarcely imagine such scenes as related above. Through these same windows, with their magnificent stained-glass, the sun pours, flooding the interior with a mass of subdued light. The windows exceed the piers in size, and the massive vaulted ceilings seem to be held by an almost invisible support. We are standing at the end of the nave, and away before us stretches this vast vault, four hundred and forty-three feet, while over the crossing can just be seen the supports of a tower, one of the most graceful and delicate designs in existence.

Walk up now under the dome of the tower; look either way, and a marvellously beautiful sight meets the eye. The immense rose-windows, with their delicate stone tracery, seem like gems set with precious stones, and totally obliterate the memory of the fearful tragedy in connection with their building.

Passing on through the west porch, we enter the deep-set and beautiful triple portals, which are very similar to those of the church we will next visit, St. Maclou.

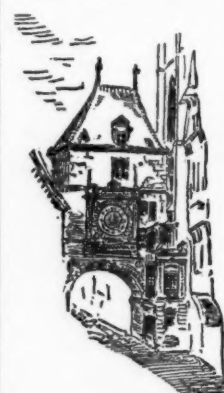
Here the carvings are even superior to those already visited, more refined and more beautiful, while the entrance doors are marvels of both design and execution, consisting of Scripture subjects carved in relief by Jean Goujon, the Correggio of sculptors. A service is going on here; the grand old organ peals out now and then, the little choir-boys sleepily chant their service, the priests meanwhile reverently kneeling, while here and there, but few and far between, peasants kneel in devotion. We can only sketch a bit of border-work on the inside of one of the doors before we are very properly stopped by the sacristan. Many a sketch-book can show this same thing, probably, for they have been well studied.



On, past the Cathedral again, we turn to the right, up a little street, and before us is a gateway which discloses the whole mass of the Palais de Justice, forming three sides of a square, and for which we have been looking. How often had we studied this mass, both in part and as a whole; here it is now before us in very reality. If you act as we did, you stop and take a good look at it before entering. To endeavor to make a hasty sketch is perfectly useless, and would only spoil the recollection of many a student, for detail here is quite as much as mass.

The architect is puzzled with the amount of detail and ornament, notwithstanding the fact that it was built at a time when the Gothic had run itself to extravagant, rather than judicious, detail. The windows, although generally square-headed, seem to be set in canopies of delicate tracery-work, with the whole bound together by a carved balustrade, directly over the cornice. Louis XII himself could not have asked a more fantastic adornment, for the niches, buttresses, and pinnacles, are occupied by saint and sinner, probably in about equal proportions, and justice is supposed to be meted to both alike. The dormers are exceedingly beautiful against the steep roof, while below a massive staircase introduces us to the Salle des Procureurs, a perfectly simple hall, one hundred and sixty feet long, without decoration, and covered by an immense open roof through which the gables pierce.

More interesting perhaps would have been the Salle des Assizes, had we entered it years ago, for then the wainscot was ornamented with arabesques and mottoes, which not only were intended to instruct the old judges as to their duty to offenders, but also pictured the latter enjoying all kinds of punishment. Whitewash, however, seems to have been cheap in the hands of some miscreants, who made use of it to efface them, and the main feature of the hall at present is the carved black oak roof, enriched with gold.



Meanwhile time with its unending stride has passed very rapidly, for we hear a deep-toned bell in the next street. "The curfew tolls the knell of parting day" from the old Beffroi of the Grosse Horloge, a custom that has been kept up year after year, and even as we pass under the ancient archway, the old bell peals forth the last notes of its evening song. The day is ended, and crowds of laborers in blouses clatter along the cobblestones, women with baskets on their heads pass by, each with a large fanciful handkerchief around her neck; the store-keepers are shutting their stores, wisely concluding the light of day to be the boundary of a day's work, while we, mingling with them, pick our way back to the modest little Hôtel de Normandie, with its old courtyard, the recollection of which will perhaps cause pleasant memories to arise in the minds of many of my readers. We have not half seen the old city of Rouen, and must devote another day to it.

CONCRETE IN FOUNDATIONS.—II.¹

LIME concrete, which has been known and employed for centuries, and perhaps never less understood than during the last one, in England at least, is now used in all cases where the ground is of a fairly unyielding nature; and where the lime and the aggregate are of a suitable quality, a very excellent foundation may be obtained. But there is a vast difference in the nature of various limes, attributable to the natural qualities of the limestone from which they are made.

Lime which consists only of carbonate of lime makes a mortar soluble in water, and therefore totally unfit for a matrix. Lime made from the upper strata of the chalk deposits is well known to be of this description, and is, or should be, used only where no damp or moisture can affect it. On the other hand there are some limes that are unaffected by water, and as a matter of fact set under water equally as well as in the atmosphere. Lime made from the blue-lias stone is an example of this kind. The soluble limes are called "rich," and the non-soluble "poor," designations which the reader may suggest should be changed, and the strongest and best limes be styled "rich" ones. But in an ordinary way, all limes which set under water are termed "hydraulic," and those which will not, and are soluble in water, "non-hydraulic." The reason why certain limes should possess the former quality was discovered by Smeaton, the celebrated engineer, who by chemical means dissolved or extracted the pure lime from a superior kind of limestone, and found the residue was a stiff clay, and with which he actually made a good red brick. The fact is, therefore, that the presence of clay in a limestone converts, during the process of calcination, what would be a rich non-hydraulic into a poor hydraulic lime. What proportion of clay, chemically known as "alumina," and "silica," should together exist to produce the best description of hydraulic lime, is estimated by Mr. Reid at seventeen per cent, this being the amount present in one of the best-known hydraulic limes, the "Lyme Regis," although not less than ten per cent may be considered sufficient to entitle lime to be called of a high hydraulic character. Mr. Burnell says fifteen to eighteen per cent of clay is found in the best-known limestones. Where such a small proportion as about five per cent is present, the lime is called moderately hydraulic, and although well adapted for mortar for building purposes, is not suitable for making concrete.

Concrete made with six parts of crushed flints and brick-bats and one part of ground "Pyle" lime was used for the entire construction of the walls of a large block of buildings some years ago, and although two floors in height, and with but little support from cross-walls, and no walls more than twelve inches thick, the result left nothing to be desired, nor has the slightest failure resulted.

Blue-lias lime as a matrix requires reasonable precautions in its use. It must either be slaked with a sufficient amount of water to reduce it to a powder, "the hydrate of lime," or ground very fine and treated as cement. Where it is in common use for mortar, the practice is to make a conical heap of knob-lime, cover it with wet sand, and allow it to remain twenty-four hours or longer. The steam is confined and permeates the lime, and a gradual and gentle slaking takes place. When converted into a hydrate, the latter is screened for the purpose of eliminating the core and badly-burnt portions.

By this method of slaking, the possibility of core or half-burnt limestone being ground up with the well-burnt is avoided, but the process is tedious and would not commend itself for concrete-making. The loss of character which would result from a habit of grinding other than well-burnt lime, it is fair to assume, prevents well-known manufacturers from attempting anything of the kind, and moreover, such portions would be readily detected. There is a difference of opinion as to whether blue-lias lime should be used fresh or otherwise, and we may safely assume that the same practice in this respect as would apply to mortar-making would also apply to concrete-making. Pliny says the Romans forbade the use of lime unless it had been slaked for three years, but this might have been rich lime, and merely run to form a lime putty, and kept in that state ready for mixing with sand for mortar-making.

General Treussant says that hydraulic lime should be taken fresh from the kiln, and ground and used at once, whereas Smeaton had his ground and packed in casks for use in the construction of the Eddystone light-house, and employed Aberthaw lime in important works seven years after it had been ground. But it is well known that lime will considerably expand after being ground, and during the time it is absorbing humidity from the atmosphere, and those who have kept it in sacks for some time after they were filled with lime fresh from the mill, would no doubt be able to confirm this from the fact of the sacks becoming split from bottom to top. Now it is quite certain that if lime expanded more than the most trifling amount after use, the concrete itself must be unsound, and yet it is far from common to hear that this expansion is a necessary feature in concrete in foundations, because it thereby fills the trenches tightly, and where natural foundations of existing buildings have failed, the use of concrete for underpinning, made from the freshest lime obtainable, has been repeatedly practised with the avowed

object of causing the concrete to expand and prop up the sinking walls. Had the same concrete been deposited in temporary wood moulds, or between boards representing the thickness and depth of the underpinning, and after remaining sufficient time to have set, the casing boards were removed, the concrete would rapidly split up into fragments, and disintegration follow. For underpinning where homogeneity is an important element, concrete of this description is valueless.

But I am quite aware that many specifications enforce the use of lime, even blue lias, as fresh as can be obtained, and direct it to be mixed "hot." This is, however, a great mistake, for no matter what the purpose for which it be used, blue-lias lime should not be touched until it has left the millstones at least a fortnight. The better plan is to specify that it shall be shot out of the casks or sacks, as the case may be, onto a wood floor in a water-tight enclosed building, for at least two weeks before use, and in addition it should be occasionally stirred, or moved about with a rake or plasterer's hair-hook, to allow the air to circulate about it.

The result of using it fresh, or even a few days old, has invariably been in my own experience to find the work more or less "blown," while on the other hand, if treated as described and mixed with a suitable aggregate in the proportion of five or six to one, concrete of the best description will be the result, admittedly not equal in strength to that where a corresponding amount of Portland cement is used, but suitable for all ordinary purposes where the weight to be carried is not more than common, and the ground is fairly unyielding; and even more, for it will make walls above ground as strong and as durable as the usual class of brickwork.

Portland cement as a matrix for concrete in foundations, it must be acknowledged, is unsurpassed for the purpose, and possesses some peculiar advantages when compared with lime, one of the most important being that, whereas lime concrete cannot be improved by the addition of lime beyond the relative proportions of one to four, cement concrete can be increased in strength with every proportional increase of cement, till the respective amounts of the matrix and aggregate are equal. Necessarily, concrete approaching even to this description is only applicable to some highly important work, where cost is the minor consideration, or where extraordinary strength is the main object. But it becomes a question whether in some instances Portland cement might not be employed for concrete in foundations instead of lime, and closely compete with it in ultimate cost, where, for instance, the work to be executed was in proximity to the cement-works and at a distance from any good lime-kilns.

The Continental method of making concrete, better known as *béton*, differs from the system practised in this country, inasmuch as in the case of the latter lime and sand are made into a liquid water grout, and poured into or over the aggregate, which necessarily has been deprived of its sandy portions, or nearly so, and although some excellent concrete is made in this way, and although the Selenitic Cement Company advocate this system, on the recommendation of the late General Scott, yet the ordinary method of making concrete by mixing all the ingredients together in a dry state, and then adding water gently thereto while the mass is being turned over by two or more laborers with shovels, finds, I think, most favor; certainly, after giving both systems an impartial trial, I entertain no doubt that the latter gives the best results.

It is common in Italy and other parts of the Continent to first deposit a layer of concrete or *béton* a foot or less in thickness in the trenches, and on this, or rather into this, place a layer of broken stone (for unless the stone is well worked into the concrete, homogeneity must be considerably affected), then another layer of concrete and stone as before, and so on alternately concrete and stone, to the full height of the foundations.

The effect of this is a large saving in concrete, and equally as good a result, provided the proportion of stone employed is not too large; and in this country, where work of the kind is usually done by contract, the temptation to reduce the more expensive material, and increase the amount of what we call packing, is, in foundations, where everything is rapidly out of sight, oftentimes too great to be resisted, and unless very strict supervision is exercised, or a man of undoubted probity has the work to do, it is as well to forbid the use of packing altogether.

Selenitic cement is ordinary ground rich lime, to which is added, during the process of passing through the millstones, or at the time the cement is being prepared for use, three per cent or more of sulphate of lime, and a much larger proportion of unctuous clay. Although to all intents and purposes a lime, it is claimed as a cement, because the sulphate of lime which is added to it prevents the slaking peculiar to all limes in their natural state. Whether it is in any way superior to ordinary hydraulic lime for strength is doubtful, but that it may be used with less care is probable—that is to say, if the relative proportion of sulphate of lime, to prevent expansion, is previously added. That plaster-of-Paris, which is, in point of fact, the product of sulphate of lime, has the property of quickly solidifying ordinary lime mortar and preventing it from cracking or blowing, has been known from time immemorial, but that it increases the ultimate strength of the best limes for concrete has not yet been proved.

In mixing concrete for foundations, it is advisable not to perform the operation on the bare ground, for not only is more or less dirt sure to be scraped up by the workmen's shovels, but the labor is greater than if a few loose boards, or better still, movable ledged

¹ Continued from page 55, No. 423.

platforms made for the purpose are laid down. Eleven feet square for the latter is a convenient size, which will allow of a cubic yard of concrete being mixed at one time; and for portability they may be in halves, $5\frac{1}{2}$ x 11', and the ledges prolonged, so as to obtain a solid bearing where they join together.

A bottomless measure made to hold the amount of aggregate fixed upon is by all means essential, and this should have handles at each corner by which to lift it up after being filled; so is a measure for the lime or cement, and the relative proportions are best obtained by cubing the contents of each.

Should an ordinary two-bushel measure be employed for the cement or lime, it may be as well to state that twenty-two bushels go to a cubic yard.

The aggregate measure being placed near one edge of the board and filled, is lifted by the handles, leaving the contents in a rough conical shape, and the matrix, being deposited on the apex of the cone, gets fairly distributed over its entire area. The materials should be then turned over with shovels by two men facing each other, and literally turned over—not taken up and deposited down again without the change of position so necessary to ensure thorough incorporation and admixture. A third man should help to still further effect this latter by raking the ingredients with a long-handled rake, similar to a hair-hook, as the two men cast them down; this process having been repeated, a fourth man, standing behind the heap, now adds water from a large rose water-pot on the portion the two shovellers are operating upon. The effect of this *modus operandi* is that the water, being added gently, does not carry away the finely-ground lime or cement, and is helped in this respect by the materials being seized upon by the shovellers at the very moment the water is added. The man with the rake completes the distribution, which the others may not have perfectly accomplished.

As was done with the materials in a dry state is also repeated in the wet condition, so that the whole should be turned over "twice dry and twice wet," and at once wheeled away and deposited where required.

The amount of water necessary for a given quantity of concrete cannot be stated with even approximate accuracy. The aggregate may be of an absorbent nature, or the reverse; it may be quite dry or it may be very wet; or it may be composed of coarse or of comparatively small materials. In either of these cases the quantity of water needed must vary very considerably, and can only be ascertained by practice. But it is safer to use too much than too little water.

I have in these instructions advisedly said how the work *should* be done, because practically it is often left to the actual workmen to perform, and indeed is often considered as beneath the personal attention of either the architect or clerk-of-works, and it is only fair to assume that in such cases it will be executed in the way that comes easiest, and which usually consists of wheeling so many barrow-loads of the aggregate into a heap, sometimes on boards, sometimes not, and upon which latter is emptied a sack of lime or cement as it comes from the works, and the contents more or less spread over the aggregate. Water in buckets, from an adjacent tub of water, is then cast over the heap by one man, while the others look on, and when the water is in the act of carrying away a portion of the lime, or has already done so, the materials are leisurely turned over about twice at most, wheeled away, and pitched sidelong into the foundations. This primitive method of making concrete is not peculiar to persons or places, but is practised as much in the metropolis as elsewhere, and indeed, inferior concrete is as common in London as anywhere. The rule-of-thumb principle, so generally adopted for concrete in foundations, admits of no justification, not even on economical grounds, but a much less quantity of lime or cement would do equally as well if in the one case it were thoroughly and evenly incorporated, when in the other instance it is not, and homogeneity is such an important element in concrete in foundations that unless the proportions of the aggregate and matrix are fairly apportioned, a large percentage of the obtainable strength is wasted. The practice of tipping the concrete from a height of six or eight feet, once so commonly specified, is now to a great extent abandoned, for it has been proved that instead of fulfilling the desired object of rendering it close and uniform in character, the concussion has exactly an opposite effect, separating the larger portions of the aggregate from the smaller, and in fact undoing to a certain extent what has just been accomplished in the turning and mixing by the workmen's shovels. Perhaps there is nothing better or more effectual than treading it, provided sufficient treading is permitted, but where only one man is told off for this object while a dozen or more are rapidly mixing the ingredients and filling in the trenches, homogeneity cannot be anticipated. As the foundation is more or less yielding, so in proportion is it necessary to make the foundations wide or narrow, never in any case, of course, less than the width of the bottom course of footings. It is customary to specify that the width of the concrete trenches shall be from four to twelve inches wider than the footings, depending, as a matter of necessity, upon the nature of the ground. Where it is practicable, the concrete itself should be wedge-shaped in section, with its wide end forming the base, and the narrow end at top no wider than the bottom course of footings. The same amount of materials required in an ordinary way for foundations of a uniform thickness throughout, would in this way give greater strength nearer the bottom, and a larger superficial area of natural ground covered by the concrete. Practically the concrete

that projects on either side beyond the footings, assuming it is of good quality, is to a certain depth useless, and if added to that portion nearer the base, gives an equitable distribution of strength. Except, however, in stiff clay or some other tenacious soil, excavating trenches of this form is attended with some difficulty, although it might often be possible to give the foundations a wider base, by paring the sides of the ground away for a foot or two from the bottom.

Where "pot holes" or soft places occur in foundations, otherwise good enough, a couple of feet in depth of good cement concrete should be thrown in, and which effectually takes the place of the brick arch formerly adopted in cases of this kind, and at a much less cost. Where the foundations have to be excavated to some considerable depth, and then even with no very satisfactory result, cement concrete for the first three feet, and blue-lime concrete for the remainder, up to the level of footings, would serve the purpose as well as using all cement concrete, or the latter might be reduced in strength—say commencing with one of cement to seven of aggregate, and finishing off with one of cement to twelve of aggregate, supposing, of course, that the superstructure was not unusually massive and heavy. A mistake is often made in levelling the concrete too high, necessitating making up the foundations on each side with loose ground. Provided the concrete is of a superior character, no harm will arise, but with the too common description of concrete it is a dangerous practice, as the weight of the superincumbent mass may cause the foundations, having no lateral support, to spread and collapse. The downfall of an engine-shed on the Metropolitan Railway some years ago was traced to a case of this kind.

Concrete in foundations will appear, no doubt, to many a simple matter, not requiring much care, and of minor importance compared with other constructive details; in reality it is a factor of importance, worthy of far greater attention than is usually accorded it. — T. P., in the *Building World*.

THE ILLUSTRATIONS.

HOUSE AT OSWEGO, N. Y. MR. FRANKLIN H. JANES, ARCHITECT, ALBANY, N. Y.

THE exterior of this house is to be constructed of red sandstone and darkly-burned common bricks, all laid up in chocolate-colored cement. The roofs tiled, the nearly horizontal portions being arranged for use in summer. The terrace, etc., will be of stone and tiles, and the vestibule floor laid with mosaics. The arches between the hall stairway-recess and library will have elliptical-arched stained-glass tops, and heavy curtains below. The fireplace in the library will be constructed of terra-cotta, with an opening of six feet for the reception of large logs. The entire first story, with the exception of the parlor, pantries, etc., will be finished with hard-woods. The walls of the hall will be panelled to the ceiling with the ceiling-joists of white-oak, all the panels being of dark oak. The library will be finished with red cedar, and cottonwood panels, stained a very quiet yellowish-green. The dining-room will be finished with sweet-gum woods. The wood-work of the parlor will be of white-holly, with brass inlay; the walls covered with tapestry, and the ceilings with papier-maché. The doors connected with the servants' passage on main floor will be concealed in the panelling of the deeply-recessed doorways between the parlor and hall, dining-room and library. This will permit the servants to pass to and fro without notice. The doorways will be arranged for both sliding-doors and *portières*. The flues of the sitting-room fire-place will pass over to the parlor chimney-stack. The proper flues for heating, ventilating, etc., are not shown on the sketch-plans. The premises will be heated by steam, and lighted by electricity.

HOUSE FOR W. D. FORBES, ESQ., ROXBURY, MASS. MESSRS. BRADLEE, WINSLOW & WETHERELL, ARCHITECTS, BOSTON, MASS.

DESIGN FOR A STORE AND OFFICE-BUILDING. MR. ALEX. CAZIN, ARCHITECT, DENVER, COLO.

HOUSE FOR G. B. SWAIN, ESQ., NEWARK, N. J. MR. PAUL G. BOTTICHER, ARCHITECT, NEWARK, N. J.

HOUSE FOR JOHN OESTERLING, ESQ., WHEELING, W. VA. MR. F. J. OESTERLING, ARCHITECT, ALLEGHENY, PA.

STORE AND PHOTOGRAPHIC STUDIO FOR WESLEY DEVOE, URBANA, OHIO. MR. C. I. WILLIAMS, ARCHITECT, DAYTON, OHIO.

It has been attempted to introduce in this building a sky-line at once novel and utilitarian.

HOUSE FOR COL. W. E. HUGHES, DALLAS, TEX. MESSRS. ROSSITER & WRIGHT, ARCHITECTS, NEW YORK, N. Y.

ARTESIAN WELLS IN CALIFORNIA.—There is a limit, they have discovered in California, to the underground water-supply penetrated by their artesian wells. There are such numbers of these wells in the Santa Clara Valley as to cause great complaint that millions and millions of gallons are pouring, summer and winter, from the subterranean reservoirs into the sea, so that the water level is rapidly being lowered. In Santa Barbara it is discovered that artesian wells deriving their supply from sources less than one hundred feet deep are falling, while the deeper wells are not affected.

STRIKERS' METHODS.



FOR the sake of following up a matter to which we have referred several times during the last few years, we reprint, from the New York *Evening Post*, the following interesting account of the series of troubles which have been occasioned by the strikes of the moulders in the Troy Malleable Iron Works:—

The Troy Malleable Iron Works is an establishment of very respectable proportions among the many iron factories in that city. It was founded in 1850, from which time it has had a prosperous career, in common with the kindred interests that are centred here. In 1879 the company was reorganized, three young men, Messrs. Sleicher, Griffin, and Chase, becoming proprietors. The foundry is situated on Ida Hill, somewhat remote from the principal part of the city, in a location peculiarly favorable for the instigation and carrying on of the labor trouble which has beset the company continuously for a full year. The incidents of this trouble have been noted in the newspapers as they have occurred. The repetition of outrages on persons and property in the neighborhood of the works has finally roused the city to action, as a step towards protecting its business reputation and its manufacturing prosperity.

The contest this firm has had with the trades-union authority cannot fail to be of general interest. As long ago as 1857, or about that time, the founders of the concern had a struggle with the Moulders' Union, which lasted six months and resulted in breaking up Union control over the foundry. For a period of over twenty years employers and employes went on harmoniously, the former paying no attention to whether their moulders were Union men or non-Union men.

About three months after the present firm took control of the works, that is, in November, 1879, the Moulders' Union sent its officers to the managers and formally announced to them that thereafter their foundry must be recognized as exclusively a Union foundry. Not being in a condition to resist at that time the outside dictation, the firm accepted the situation. Union rules were put in force; the manner of doing the work was in many particulars modified to suit the requirements of the Union until the employers began to feel embarrassments, which interfered with a successful conduct of the business. The Union kept apprentices out of the works so rigidly that for a whole year none were set to learn the trade of moulding. The firm formerly paid the moulders on Wednesday for the previous week's work up to the preceding Saturday, the delay being had to enable the pay-roll to be made out. About two years ago this custom was taken up by the Union, which demanded that pay-day should be on Saturday for the previous week's work, thus keeping the men out of their pay three days longer than the rule of the firm did. This demand seems to have been made for the sake of making a demand, or for the purpose of raising an issue between the moulders and the firm. The latter conceded the point, as it did others in the nature of encroachments from time to time.

Being annoyed by the frequency with which men left their work, quitting altogether or taking vacations of longer or shorter duration, regardless of the urgency of business, the firm, on February 2, 1883, posted about the foundry the following printed notice:—

On and after this date we shall require a notice of one week from all persons in our employ who intend to discontinue work. Such notices must be given to the paymaster, and will not be recognized unless so given. We will pay (even dollars as heretofore) on Saturday of each week, up to and including Saturday last preceding. No orders will be given or accepted, and no payments for wages made excepting as above stated.

The moulders, according to the statement of the proprietors, offered no objection to the regulation, and when new men were employed after it was adopted they were made aware of this notice as one of the terms of the agreement. Nothing was said by the men about the matter; but on February 21, three weeks after the notice was posted, the firm was served by a committee of the Moulder's Union with the following:—

Resolved, That the rule compelling a man to work a week longer than he wants to, be and is from this date abolished.

This was signed, "By the Committee," and was stamped with the seal of the Iron Moulders' Union of Troy. An answer was demanded of the firm within two days. The next day the firm replied by announcing to the men that it would close the moulding department, that the men might consider themselves discharged, and that they

could get their pay to date by calling at the office for it. This summary proceeding was taken by the firm because it was convinced by a long series of petty encroachments that the moulders were seeking a quarrel, which might come one time as well as another. In deciding to close the foundry temporarily the proprietors suffered losses on business and incurred risks on contracts, but they set their faces firmly against further interference from the Moulders' Union.

Then began a struggle for existence the incidents of which, including arson and personal violence, are scarcely paralleled in the fiction of trade-unionism. There was no strike, nor was there ever any difference between the firm and the moulders, on the score of wages. The earnings were from \$18 to \$30 a week, the pay was prompt in cash, and work was abundant. The foremen were not included among those who were discharged. They have remained with the proprietors throughout the contest.

An attempt was made to put in non-Union moulders, but after a few days the works again closed. At that time the city government was in so unsettled a condition that no adequate protection could be had from the police, and the men who came to the city to work in the Malleable Foundry were at the mercy of the Union moulders. One of the first assaults was made when three or four non-Union men were leaving the works during the first experiment to reopen them. They were placed in a street-car under guard of officers, but the car was fired into, the men sought shelter where they could find it, and did not return to Ida Hill. A member of the firm next went to New York and employed under contract twenty detectives, who came here for duty at the works, which were thereupon again started with non-Union moulders. This was on March 12, 1883. From that time the foundry has been kept running with non-Union men, who have been gathered in under cover of official escort.

One man came here from Providence shortly after the special guard from New York was put on the premises and its approaches. At the depot the hackmen refused to convey him to the works. He hired an express-man to take him to the Hill, but when part way there a mob of Union moulders set upon the wagon, dragged the man to the ground, and so cruelly beat him that he could scarcely crawl out of the street. This was in the middle of the afternoon. One of the firm, Mr. Chase, happening by soon after, found the wounded man, and with an officer took him in a wagon to the works. While on the way a moulder stopped the horse for a renewal of the assault. The assailant was arrested and fined \$30. At another time a gang of moulders went to the boarding-house of an employé of the works, who, when he came to the door, was assaulted with an iron rod and badly beaten. In order to protect their men the proprietors had beds extemporized in the foundry, where the men slept. In the daytime their meals were served in the shop. Frequent assaults were made on them by firing through the windows. These and other outrages occurred during the spring of last year. When the weather became too warm for the men to remain at night in the foundry a building near by, an old church, was rented by the firm for the accommodation of the working moulders. This was set on fire four or five times, and an attempt was made to mine a neighboring building where some working builders were housed. Breaches of the peace occurred daily and nightly. It was unsafe for any of the men employed to go into the city or to be out alone at any time.

Finally, in the early part of June, two working moulders went into the city on some personal errand. They were jostled going and returning. When about half-way up the hill they were assaulted, a counter attack was made, pistols were fired, and one of the attacking Union moulders was shot dead in his tracks. The other was wounded severely. Among the arrests that were made Mr. Sleicher, of the firm, was included on a charge of being accessory to the murder. One man named Egan, a Union man, who came to be known as Egan the Spy, made affidavit that Mr. Sleicher had offered a premium of \$15 for Union moulders' scalps, and that the killing that had occurred was the result of this offer. On the examination Mr. Sleicher was discharged.

These are only samples of the acts of violence that have been committed on Ida Hill during the past year. Scarcely a week has gone by without its crime in that locality. The Union moulders have kept a strong force patrolling Congress Street, up the hill, and the adjacent streets and alleys, for the purpose of setting upon working moulders or strangers approaching the works who might be suspected of seeking employment. This patrol became exceedingly audacious about the premises. The working moulders became so much annoyed and alarmed that, on the 11th of December last, the greater part of them left the works. Then the Union men proclaimed that they were keeping an organized patrol, and that the foundry must be broken up or be made to submit to the Union's terms. The perambulating mob thus became recognized by the city authorities as dangerous to public peace. After a great deal of legal quibbling the police of the city were directed to break up the patrol, the order to this effect having been issued by the Police Commissioners on January 30. Fifteen or twenty arrests have since been made, the salutary effect of which has been made to clear the neighborhood of suspicious persons. The foundry men have enjoyed during these two weeks comparative peace. The determined course of action at last inaugurated by prominent citizens will, it is believed, enable the Malleable Iron Works' firm to conduct its business without further damage and bloodshed. The effect of the trades-union wars on the manufacturing interests of the city of Troy may be judged from the following paragraph in a letter of a former stove

manufacturer here to one of the proprietors of the Malleable Iron Works. Under date of February 1, 1884, he writes from his New York office:—

"As to your troubles you know my sentiments too well to have me reiterate them. Sufficient to say that, having gone through the same trouble in 1876, and running at great sacrifice, I determined never to be placed in the same fix again. Finding that, some years later, I had got to go through the ordeal again, and perhaps over and over in your miserable city, I packed up my lay-out, and moved into a civilized country."

The foundry which this gentleman removed from Troy is now doing a prosperous and peaceable business in Connecticut.

This evening a meeting of citizens was held in the City Hall to express the sentiment of the community with reference to the scenes of violence that have been enacted here in connection with the labor troubles. The meeting was called by circular, and no one was admitted without possessing one of the cards. The attendance was large. Addresses were made by William E. Gurley, the manufacturer of surveying instruments, who presided, by General Alden, Mr. Allen, and other business and professional men. Steps were taken to form a law and order league, by the appointment of a committee, consisting of two from each ward, which is charged with the duty of perfecting an organization whose object shall be to urge upon the city authorities the necessity of preserving the peace, and of protecting manufacturers and their employes from the encroachments of disorderly Union men, and all others who interfere with the rights and liberties of citizens. The object of calling the meeting by invitation was to preserve it from the control of those who might not be in sympathy with its object; but the invitations were, it is said, imitated, and a large number of men who took exception to the sentiments of the speakers gathered in the hall. They were civil, however, with the exception of boisterous cheering when one or two of their number got the floor and made speeches.

CHIMNEY CONSTRUCTION.



investigations in this branch of architectural and engineering construction.

Chimneys are constructed principally for two purposes: first, to create the necessary draught for the combustion of fuel; second, to convey the noxious gases to such a height that they shall be so intermingled with the atmosphere as not to be injurious to the health of the neighborhood.

A chimney-shaft when in work contains a tall column of heated air which, being lighter than the outside atmosphere, is forced up by a corresponding column of atmospheric air pressing into the entrance of the furnace; thus a displacement of hot air is constantly being effected, and its place filled by normal air forcing itself through the furnace of the boiler, which in its turn is heated and displaced. The column of atmospheric air and the column of rarefied air in the chimney are somewhat like a pair of scales, or the two ends of a lever, of which the boiler is the fulcrum.

Foundations.—In building large chimneys one of the most important points is the construction of the foundation. Very much will depend, of course, upon the nature of the ground. When we are on solid rock it is only necessary to excavate to such a depth that the heat of the gases will not materially affect the natural stone, and to a depth sufficient to allow the necessary spreading of the base. In

many instances, however, chimney-stacks have to be built near rivers and on sites where the upper strata are of alluvial clay or made ground, and it is necessary to carry the foundation deep down until a stiff clay, hard sand, or rock bottom is reached; this frequently entails excavation 25 feet or 30 feet deep or even more, and it is not only requisite that the foundation should be large enough to carry the superincumbent weight, but also that it should be of such an area that it will not allow the base to be forced into the yielding ground. These deep foundations are usually constructed of concrete. In some cases piles are driven in to form the foundation, as, among others, in a brick chimney erected at Boston, and in an iron chimney constructed at Ohio, U. S. A. This is a measure which the engineers must decide upon the advisability of using, so as to economize material without risking unequal subsidence, which cannot be too carefully guarded against; and, in fact, it is the practice in the erection of tall stacks to construct the foundation and pedestal, if any, and allow them to stand some considerable time before proceeding with the shaft proper, in order that the work may set, and any slight settling take place before a great weight is built upon it. As a remarkable instance of the general settlement of the foundation of a shaft, we may mention a chimney which was built by Mr. Clegg, at Fulham, over a quicksand in which an iron rod sank to a depth of 15 feet with little more than its own weight as pressure. During the erection the concrete foundation sank bodily 1 foot 4½ inches without cracking the shaft or causing it to deviate from the perpendicular. From this it will naturally follow that in all cases the ground at the foundation should be equally resistant, or unequal settling will take place as in the disastrous case of the Newlands Mill chimney, Bradford. Some of the pressures exerted upon the foundation are given under the respective descriptions of the chimneys.

Copings and Cornices.—The stone coping or cornice of a chimney will seldom require more to hold it together than two good cramps across each joint; they should be of copper, or double-dovetailed slate dowels. On no account should iron cramps be used, as they will oxidize and burst the stone. Heavy and large caps are often the source of great danger, inconvenience and expense, as the cap at the top in a gale of wind acts upon the shaft as a weight at the end of a long lever. The cap when finished should be a complete whole, or so bound together that the joints cannot open, and be so proportioned that its centre of gravity is within the outer circle of the shaft on which it rests, and it should be designed so that the wind striking against it is deflected upwards.

Bond.—In large factory chimney-shafts the longitudinal tenacity which resists any force tending to split the chimney is of more importance than the transverse tenacity; therefore, in these structures it is advisable to have, say, three or four courses of stretchers to one course of headers. In some circular stacks a uniform header bond for the outside courses of brickwork is adopted. This is a practice condemned by some authorities.

Wind-Pressure.—It is usual in this country to estimate, as the maximum pressure, fifty-five pounds per square foot, but, as in 1868, the pressure of wind at Liverpool was registered at nearly eighty pounds per square foot, it is advisable to take a higher factor.

If the wind-pressure on a square chimney be taken as 1,
that on a hexagonal chimney may be taken as 0.75
" octagonal " " 0.65
" circular " " .5

Wrought-Iron Chimneys.—Wrought-iron shafts have found great favor in America and Russia, but in England and the Continent generally, as far as we have been able to ascertain, they are an exception. In addition to the wrought-iron shafts detailed in this paper we have been informed of the following: Messrs. Witherow & Gordon, of Pittsburgh, Pennsylvania, U. S. A., have, since 1876, built upwards of thirty wrought-iron shafts, varying in height from 100 feet to 190 feet, and from 5 feet to 9 feet in diameter. The firm write us that these shafts answer admirably the purpose for which they were built. Mr. L. S. Bent, Superintendent of the Pennsylvania Steel Company, Steelton, Pennsylvania, U. S. A., states that his company have the following eight wrought-iron shafts in use, and have found them both durable and economical:—

No. 1,	170 feet high,	6 feet 6 inches diameter,	built 1881
No. 1,	165 "	" 6 " 6 "	1877
No. 1,	135 "	" 7 " 6 "	1880
No. 1,	112 "	" 6 " 6 "	1881
No. 4,	110 "	" 7 " 6 "	1869, '74-5-6

They are lined for 30 feet with 9-inch fire-brick, and the remainder of height with 4-inch red brick. The Ravensdale Iron Works chimney-shaft, Tunstall (Messrs. Robert Heath & Sons), is a circular wrought-iron shaft not spread at its base. Its height from ground-line to top is 75 feet; outside measurement at ground surface, diameter 6 feet; ditto at top, diameter 6 feet. Seventy-five wrought-iron plates were used in the construction of this shaft, the thickness being ¼ inch. The plates have a lap of 2½ inches, and are riveted together with ½-inch cup-headed rivets. The shaft is lined its entire height with fire-brick. The shaft carries off the fumes from three boilers. The wrought-iron chimney of Messrs. Francis & Co., of the Nine Elms Cement Works, Cliffe Creek, Rochester, was erected in 1878. It was designed by Mr. V. de Michelle, C. E., and constructed by Messrs. Fielding & Platt, Gloucester. The shaft is circular and parallel throughout, and is constructed of wrought-iron plates. The plates vary in thickness downwards from ½ inch to ⅜ inch. Its height from ground-level to top is 160 feet; external diameter throughout, 5 feet; internal diameter throughout, 4 feet 6 inches. It is lined with three-inch fire-brick

¹ We are asked to state that the authors intend to extend the paper considerably for separate publication, accompanied by illustrations, tables, etc., so as to make it useful as a work for reference.

² Printed in the *Builder* for that year, pp. 461, 490.

its entire height. The chimney is stayed against the wind by four 3½-inch steel guy-ropes. This chimney was erected over the central one of a row of nine cement kilns, which are all connected to shaft by a wrought-iron horizontal flue four feet in diameter. Two additional ones have since been added, and the chimney now carries off the gases from eleven cement kilns. Round the outside of central kiln on ground-level is fixed a cast-iron curb or base-plate. On this base stand four cast-iron standards or supports having their lower ends butting onto and secured to base-plate. The standards incline inwards until their upper ends meet to support a cast-iron circular chimney-base, which forms the top of the central kiln. The wrought-iron chimney proper commences from top of this circular cast-iron base, directly over which the 4-foot horizontal flue is connected to shaft. For the construction of this chimney a timber stage was erected at the level of the kiln tops, and upon this stood the rivet fires. Four winches were worked on this stage, and to them were led guy-ropes, after passing round blocks at convenient distances. A hydraulic press, with a four-foot stroke, was then fixed over the central kiln, and the top length of 20 feet, which had previously been riveted-up on the ground, and raised to the stage-level, was placed upon the ram. The ram was then pumped up, and the 20-foot length raised a height of 4 feet, the guy-ropes being slackened out to the required extent, as the 20-foot length gradually rose. A 4-foot ring of plating was then riveted on with ½-inch snap-head rivets and the usual lap, the ram was then again pumped up, and the now 24-foot length raised the necessary height; another ring of plates was then riveted on, and the operation repeated until the chimney had reached its required altitude. The cost of this chimney was about £1,000, including long wrought-iron flues.

Messrs. Wessfield & Co.'s Chimney, Chemical Factory, Barmen, Prussia.—This has a square brick pedestal, and an octagonal brick shaft. Its total height from foundation to top is 345 feet; height from ground-line to top is 331 feet. The pedestal is 20 feet square by 40 feet high by seven bricks (equal to 5 feet 3 inches) thick. The octagonal shaft is 291 feet high, 17 feet outside diameter at the base by five bricks (equal to 3 feet 9 inches) thick; 11 feet outside diameter at the top by two bricks (equal to 1 foot 6 inches) thick. The shaft diminishes 2½ inches in every 10 feet in height, or 1 in 48. The internal octagonal clearance is 8 feet throughout. The foundation is on a bed of hard and coarse gravel, and made of large flat quarry-stones bedded with "terrac" mortar in the proportions of one lime, one river sand and one "terrac" (a kind of pozzuolana). The pressure on the lowest part of chimney proper is equal to 21,335 pounds, or nine and one-half tons per square foot. The pedestal and shaft were built with bricks and ordinary mortar, composed of one of lime to two of river sand, prepared every morning by the masons themselves. On rainy days cement-mortar was used in the proportion of one cement to two river sand. The courses of brickwork were flushed up with cement as construction proceeded. The crown of the shaft was built with cement exclusively. The foundation and pedestal were built in the summer of 1867, and the construction of the chimney was successfully completed in October of the same year. According to the original design it was intended to build to a height of 260 feet, but as the erection was proceeding in a very satisfactory manner, it was considered safe to increase the height without altering the dimensions of the base; but before doing so a comparison was made between the pressure on the foundations of this chimney and the pressure on the foundations of a chimney erected at Bochum, Prussia. These were found to be as follows:—

Lowest part of chimney proper.			
	Press. per sq. ft.	Press. per sq. lb.	
Chimney at Barmen, Prussia.....	21,335 lb.	149 lb.	
Chimney at Bochum, Prussia.....	18,429 lb.	128 lb.	
Excess of pressure on Barmen chimney foundation.....	2,906 lbs.	21 lb.	

The three masons who constructed the chimney daily changed their positions, so as to equalize any unevenness in their respective laying. Every fifty feet a course of brickwork was painted black so as to indicate the height of any point of the chimney above ground. The chimney was built from the inside. The materials were hoisted by a steam-engine erected temporarily near the place of construction. The frame which supported the upper drum over which the chain worked was moved higher after the completion of every three or four courses, and was at the same time turned horizontally, from one side of the octagon to the next one, so as to equalize the pressure of the frame on the masonry. The holes made into the masonry to support the frame were filled up with bricks and mortar immediately after the removal of the frame to a higher level. The chimney when completed (October, 1867) was vertical. In the spring of 1868, remarkable for storms and long-continued gales, this stalk inclined towards the northeast by the action of the southwest wind, probably aided by the softness of the mortar and the large size and shape of the ornamented chimney crown, which caught the wind and acted as on a long lever. The deflection was considerable at the end of May, and apparently increased. As before mentioned, layers of bricks in the shaft at distances of fifty feet from each other were painted black. The height of these black lines above the pedestal being known they were, by means of a theodolite, projected on a board which was fixed on the pedestal, and these projections showed that at

251 ft. high the chimney was out of plumb 45 inches.	
210 " " " " " 30 "	
160 " " " " " 16 "	
110 " " " " " 5 "	

The pedestal stood perpendicular. As the canting of the shaft was

still increasing, immediate action had to be taken. The ordinary method of straightening chimneys was at first resorted to. A hole was made through the whole thickness of the masonry on the side of the chimney which required lowering, at a distance of 4 feet above the top of the pedestal; into this hole a saw was passed and an attempt was made to cut through one-half of the shaft, but owing to the thickness of the wall and the hardness of the bricks the saw could only be worked from one end, and the effect of sawing after two hours' work was almost nil. The hole through the stalk having been made with little trouble, and the difficulty experienced in sawing, led to the idea of removing a course of bricks and replacing it by a thinner one. Before the work was proceeded with, an experiment was made on an old inclined shaft 120 feet high. This proving successful, it was determined to treat the new chimney in the same way. A layer of bricks was broken out by means of pointed cast-steel bars, varying from 1 foot 6 inches to 5 feet in length. The diagram shows a horizontal section of this layer; the numbers 1, 2, 3, 4, etc., indicate the order in which the brickwork was removed. When Division 1 was broken out it was replaced by thinner bricks covered with "terrac" mortar. After this the two divisions marked 2 were broken out and replaced by thinner bricks; then the two divisions marked 3, and so on until one-half of the whole course had been exchanged. Purposely-made flat shovels with long handles were used to lay the bricks which had to be placed near the inside of the chimney. A side space of 5 inches was left between the newly-laid bricks and the old ones of the next division, so as to enable the workmen to break out the latter with greater facility. The width of each single division was 2 feet to 2 feet 6 inches. The masonry directly above was sufficiently dry not to give way when a course of that width was removed from below it. The replaced bricks were thicker near the points A and C, so that the difference was greater in the middle and gradually less towards the extremities A and C. As soon as the slit reached these points the chimney began to move, and by slight oscillations slowly settled down on the new layer of bricks. The time occupied in settling by oscillation at each substituted course varied from 18 to 36 hours, according to the width of the slits, which were different in the various cuts performed. The oscillations were greater the higher the cut. At the highest cut, 100 feet from the top, the oscillations frightened the masons, and they left the place. The slit became alternately wider and narrower by ¼ of an inch. This seems to prove the elasticity of the structure. Four cuts were made, —

1st 4 feet above pedestal, greatest width	3.
2d 100 "	14.
3d 140 "	14.
4th 191 "	13.

After the completion of this work the chimney continued during several weeks to settle slightly in the direction opposite to its former inclination. This circumstance had to be carefully considered beforehand, or else the slits would have been made too wide, and so have produced an inclination in the opposite direction. A severe storm on the 6th and 7th of December, 1868, which overthrew several chimneys in the neighborhood, did not affect this one. The result of the straightening operation described above was quite satisfactory. The heights of the upper cuts were reached as follows: Standing on a platform, the masons made a number of holes into the exterior wall of the chimney, four feet above the platform on which they stood. Into these holes the ends of the iron bars were fixed, and boards secured to them, so as to form another platform. Standing then on the latter, they fixed another platform, four feet higher, in the same way. Every second platform was removed, so that the remaining ones were eight feet apart; they were then joined by ladders for the workmen to ascend. This method of straightening is only practicable when the chimney has a considerable diameter, and when the mortar is sufficiently dry as not to give way under pressure of the bars and platforms.

Chimney at Duisburg.—In December, 1868, a chimney was straightened at this place by the method just described, but as the diameter was not so great as that at Barmen, and as the mortar was soft, a wooden scaffold was erected around the shaft to reach the upper points which required cutting. The breaking-out and replacing of bricks could not be done in divisions wider than five inches to ten inches, as the upper masonry, not being dry, would have settled down. When the chimney was straight a further settling down towards the side of the cuts was prevented by driving iron wedges, covered with mortar, into the slits.

Mr. Bancroft then went rather fully into the details of the melancholy and discreditable chimney accident at Bradford; but all the particulars of this were so fully summed up and commented on in our columns at the time (*Builder*, February 10, 1883), that it is hardly necessary to print a recapitulation of the subject here. Mr. Bancroft proceeded to give the following particulars in regard to the

Edinburgh Gas-Works Chimney.—This chimney was designed by Mr. Mark Taylor, engineer to the company. Messrs. Geo. Buchanan, C. E., and Prof. Gordon, of Glasgow, were consulted. The builders were, for the stone-work, Mr. James Gowan, of Edinburgh, and for the brickwork, Mr. James Bow, of Pollokshields, near Glasgow. The pedestal is square and of stone, surmounted by a circular brick shaft. Its dimensions are:—

Stone foundation underground.....	6½ feet.
Part of base.....	6 "
Stone pedestal above.....	65 "
Brick shaft.....	264 "
Total height from foundation to top.....	341½ "
Height from ground-line to top.....	329 feet.

The foundation stone is forty feet six inches square by six feet six inches deep. The pressure on the bottom of foundation per square foot is nearly two and one-half tons. The stone pedestal is 30 feet square at ground line and 27 feet 9 inches square at top. The internal diameter of the pedestal is 22 feet 6 inches at bottom and 20 feet 4 inches at top. This was built during one summer, at the end of which the works were suspended until the following year. The brick-work of the shaft was commenced and finished in the summer following the erection of the pedestal. The following dimensions relate to the outer brick shaft (circular):—

Outside diameter at bottom.....	26 feet 3 inches.
Internal " "	20 feet 5 inches.
Outside " "	15 feet.
Internal " "	12 feet.

This was built up in five steps as follows:—

1st section, 35 feet high, 3 1/2 b.	
2d " 40 feet " 3 "	
3d " 48 feet " 2 1/2 "	
4th " 58 feet " 2 "	
5th " 83 feet " 1 1/2 "	

264 feet total.

The greatest pressure on any part of the work comes at the lowest section, where it amounts to about 8 tons 2 cwt. per square foot. The inner brick-shaft (circular) is distinct from the outer shaft, and is 90 feet high, with 13 feet internal diameter throughout, and was built in four steps, viz.:—

1st section, 14 feet high, 35 inches thick.	
2nd " 6 feet " 30 "	
3rd " 30 feet " 25 "	
4th " 40 feet " 20 "	

90 total.

The thicknesses include a lining of fire-brick 10 inches thick for 20 feet, and 5 inches thick for the remaining 70 feet. The weight of the materials used is about 3,700 tons. The total cost was £4,637. The lightning-conductor is a solid copper rod 3/8-inch diameter. The stones used in the foundation are Cragleith, Humble, and Hailes, which before use were tested by Mr. Buchanan and Mr. James Gowan. The tests were made in the most careful way by crushing-cubes of one-inch square. The following were the results of tests:—

Cragleith crushed at 315 tons per square foot.	
Humble " 240 "	
Hailes " 225 "	

A second test of Cragleith showed that before being crushed to powder it sustained a pressure of 440 tons per square foot. The appearance after fracture of the different cubes was that of a pyramid or wedge, and this led Mr. Gowan to assert that if the cubes were enlarged a greater relative increase of strength would be gained, and further that if the pressure were vertical to the line of cleavage a greater resistance would be obtained, so that such a stone as Hailes, which is a laminated stone, would increase in strength according to its surface more in proportion than that of a rock-stone such as Cragleith. This led to discussion and further tests, the result being that with a 4-inch cube from Hailes quarry the resistance was equal to 567 tons per square foot. The bricks were supplied by Mr. Livingstone, of Portobello Brickworks, and were tested with the following results:—

Description of Specimen.	Length.	Breadth.	Thickness.	Weight.	Crushing weight on each brick.	Crushing weight per square foot.
	in.	in.	in.	lbs.	tons.	tons.
Extra size and quality.....	10	5	3	10 1-4	153	440
" "	9 1-2	4 3-4	2 3-4	9 5-16	140	448

Repairs of Chimney-shafts.—In the *Builder* for January 8, 1876, there is an interesting account of the repairing of chimney-shafts damaged during the Siege of Paris by the fire of the German artillery.

CORRECTION.

In the review of "*Hospital Construction and Management*," by Frederic J. Mouat and H. Saxon Snell, published in the *American Architect* for February 16, the name of the first gentleman was persistently misprinted as Moul.

ANOTHER COMPETITION.

February 18, 1884.

TO THE EDITORS OF THE AMERICAN ARCHITECT:—

Dear Sirs,—The enclosed advertisement appeared in one of our daily newspapers yesterday, and although it explains itself, a word in connection with it may prove interesting.

The building in question [the City-Hall and County Court-House at St. Paul, Minn.] is to be one of the most important of its kind erected in the Northwest, and will probably cost four or five hundred thousand dollars when completed. The action of the Committee taken in relation to it seems so short-sighted and ill-advised that I feel a word of remonstrance is needed from some one in connection with it. Trusting that it will receive your attention, I am,

Very truly yours,

A. B. C.

[We do not know that anything can be added to what has already been

said over and over again on this subject by every one whose opinion is worth having. If the people of St. Paul desire to entrust the spending of half a million dollars of their money to the kind of architect that answers an advertisement, "for full plans and estimates, with the distinct understanding that no compensation will be made for any such plan or estimate unless adopted," they are certainly at liberty to do so.—Eds. AMERICAN ARCHITECT.]

FRENCH AND ITALIAN RENAISSANCE.

CHICAGO, February 19, 1884.

TO THE EDITORS OF THE AMERICAN ARCHITECT:—

Dear Sirs,—Please inform a subscriber of the best works, photographs or text, on Italian and French Renaissance architecture, and oblige,

F. B. TOWNSEND.

[A. LEVY, 4 Bond Street, New York, publishes series of excellent photographic views of French and Italian Renaissance buildings. He can also furnish Sauvageot's "*Palais, Chateaux, Hôtels et Maisons, de France de XV au XVIII Siecles*," price \$70, which is a standard work on French Renaissance.—Eds. AMERICAN ARCHITECT.]

NOTES AND CLIPPINGS.

THE TUILERIES.—The remains of the Tuileries still lie about in confusion, and cover the Place du Carrousel, waiting for the chief portions to be distributed amongst the State museums and parks. Some of the finest fragments are being used for a building on the Trocadéro, close to a handsome archway constructed from remnants of the old Hôtel de Ville; others are to be erected in the Luxembourg Garden, the Monceau and Buttes-Chaumont Parks, or housed in the Cluny Museum.

THE ISCHIA CATASTROPHE.—The exact numbers killed and wounded last year in the Isle of Ischia calamity have now been obtained. On the island the total killed and wounded (not counting those who were badly bruised) amount to 3,075, of whom 2,312 were killed and 762 were maimed—the most of the latter for life. About one-half of the fatalities occurred at Casamicciola. This little town contained just 4,300 inhabitants, and of these 1,784 were killed and 443 wounded—a fearful total. There were 672 houses at Casamicciola. Of these 537 were crushed and crumbled into ruins, 134 damaged, and only one escaped intact! Of foreigners on the island there were fifty-four killed.—*Exchange.*

NOTRE DAME, PARIS, DAMAGED.—Two of the turrets of Notre Dame Cathedral were almost entirely demolished by the gale of last Saturday week, and, in order to prevent any damage from the infiltration of water through the fissures thus occasioned, the work of restoration has been commenced immediately. Decorators are engaged in restoring the vermilion color on the three large doors of the principal entrance on the square in front of the cathedral. These three doors—known respectively as the Porte de la Vierge, the Porte Sainte-Anne, and the Porte du Jugement—are considered to present the most beautiful specimens extant of mediæval work in wrought-iron. They were thoroughly restored by Boulanger twenty years ago, but since then have not been touched.—*The Architect.*

PLAQUES AT STREET CORNERS. The Communal Council of Brussels are getting into difficulties over their great scheme for recounting the history of Belgium and the biographies of her famous men at the street corners. It was proposed to place at the corners of the principal thoroughfares plaques bearing portraits of the celebrities after whom they are named, with the dates of their births and deaths, and a mention of the leading events of their lives. The plaques for the Rue Poelaert and the Rue des Petits Carmes are already prepared, but the Communal Council are alarmed at the cost—£80 for the one and £60 for the other. There being some four hundred plaques to put up, they would cost, at £60 each, the round sum of £24,000, which the Bruxellois declare, is rather more than they can stand. The plaque for the Rue Poelaert has a profile portrait of the lamented architect of the new Palais de Justice, and a list of his principal works. That for the Rue des Petits Carmes records that upon its site stood the Hôtel Culembourg, where the "Compromise of the Nobles" was signed. The cloak and wallet of William of Orange's "Beggars" are engraved above the inscription. The idea is an excellent one, and ought to be taken up in London.—*Pall Mall Gazette.*

NEW COLUMN FOR THE DUCAL PALACE.—The great sustaining column and capital at the corner of the Ducal Palace at Venice, which has recently been uncovered, is probably best known by the name that Mr. Ruskin has given it, of the fig-tree corner. The main angle of the palace, the angle toward the Piazzetta and the Mole, rests upon this column and capital; and in order to remove the old masonry, which was said to be so cracked as to be unsafe, and to insert the new it was necessary to suspend the whole of the palace at that corner upon a scaffolding of beams. This difficult task has been successfully accomplished. The new column is a magnificent monolith of Istrian stone, rather warmer in color than the majority of the stone they are using in the restorations, and it is to be hoped that it will the sooner tone into harmony with the rest of the building. On comparing the old capital with the new, the undercutting of the new is even more remarkable than that of the old; but the acanthus leaves, which are the glory of the capital, seem to have lost some of that crisp and natural curl which gave such distinction to the ancient work; while the faces of the figures that signify the planetary powers are excessively fined away, so that they miss that rough strength and individuality which belong to their antique models. On the whole, the new capital, granting that the old one had to be removed as dangerous, is a meritorious substitute; but it can never take the exalted rank of its original, which Mr. Ruskin has pronounced "the finest I know in Europe." The curious inscriptions have been accurately and literally copied from the old capital to the new, and it is clear that Mr. Ruskin has misread several points, though the meaning in many cases still remains obscure.—*Pall Mall Gazette.*

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.]

- 293,215. FIRE-ESCAPE. — N. Robert Baar, Calvin J. Coe and Ira R. Coe, Lowell, N. Y.
 293,216. STORE-WINDOW. — Lyman Clapp Bailey, Calais, Me.
 293,223. DEVICE FOR GUIDING TONGUED AND GROOVED SHEATHING-PLANKS. — Truman B. Brown, New York, N. Y.
 293,218. COMBINED LOCK AND LATCH. — Anderson D. Holland, Newport, Ark.
 293,230. APPARATUS FOR HEATING AND VENTILATING BUILDINGS. — James H. Manly, Chicago, Ill.
 293,305. ATTACHMENT FOR WARE-CLOSETS. — Luther H. Burnett, Chicago, Ill.
 293,310. SASH-HOLDER. — George P. Clements, New Milford, Pa.
 293,322. FIRE-ESCAPE. — William N. Griswold, New York, N. Y.
 293,326. DOOR-CLOSING DEVICE. — W. Antrobus Holwell, Quebec, Can.
 293,339. ROLLER-TRACK MECHANISM FOR PENDENT SLIDING-DOORS. — Edward William Martin, Lausburg, N. Y.
 293,352. FIRE-ESCAPE. — Denison C. Pierce, Chicago, Ill.
 293,385. WEATHER-STRIP. — David Warnock, Olathe, Kan.
 291,390. COMBINED AUTOMATIC FLOOR AND SAFETY-CLUTCH FOR ELEVATORS. — Thos. H. Wood, Philadelphia, Pa.
 293,413. WEATHER-STRIP. — Gustav Burkhardt, Homer, Ill.
 293,416. SCUTTLE-HINGE. — Wallace H. Carter, Farmingdale, Me.
 293,424. EXTENSIBLE LATCH. — Broomie Copeland and Frank Wright, Salem, N. Y.
 293,429. SKYLIGHT. — Alexander Drummond, Edinburgh, Scotland.
 293,436. WATER-TRAP. — William J. English, Cohoes, N. Y.
 293,473. TILE-MACHINE. — Philip Henry Kells, Adrian, Mich.
 293,489. BRICK-KILN. — William H. Melcher, Philadelphia, Pa.
 293,492. MANUFACTURE OF ROOFING-FABRICS. — Henry M. Miner, Philadelphia, Pa.
 293,497. RULE AND TRY-SQUARE. — Wiley N. Nash, Starkville, Miss.
 293,512. DOOR-LATCH. — Charles W. Pierce, Oak Hill, N. Y.
 293,523. FIRE-PROOF BUILDING. — John J. Schillinger, New York, N. Y.
 293,524. BUILDING-BLOCK. — John J. Schillinger, New York, N. Y.
 293,525. MACHINE FOR MAKING BUILDING-BLOCKS. — John J. Schillinger, New York, N. Y.
 293,527. WINDOW-SASH. — Henry W. Schroder, Springfield, O.
 293,548. DOOR-LOCK. — Bruno Wesselmann, Hamburg, Germany.

SUMMARY OF THE WEEK.

Baltimore.

BUILDING PERMITS.—Since our last report thirty-five permits have been granted, the more important of which are the following:—
 L. H. Robinson, 10 three-sty brick buildings, e s Fulton Ave., n of Tenant St.; and 2 three-sty brick buildings, w s Carrollton Ave., s of Mosher St.
 J. Keady & Co., three-sty brick building, in rear n e cor. Fremont St. and Patterson Ave.
 E. W. Haviland, 10 three-sty brick buildings, e s Light St., commencing s e cor. Randall St.; 8 two-sty brick buildings, w s Towson St., commencing s w cor. Marriott St.; 8 two-sty brick buildings, e s Cooke St., commencing s e cor. Marriott St.
 T. E. Thompson, 10 three-sty brick buildings (square), s s Townsend St., between Barclay St. and Falls Alley; 10 three-sty brick buildings (square), n s Lanvale St., between Barclay St. and Falls Alley; 3 three-sty brick buildings, w s Barclay St., between Townsend and Lanvale Sts.
 Wm. McLaughlin, 10 two-sty brick buildings (square), w s Johnson St., commencing n w cor. Barclay St.
 Wm. G. Seacrest, 3 three-sty brick buildings, w s McCulloh St., s of Laurens St., and 3 three-sty brick buildings, n s Wilson St., e of Park Pl.
 W. H. Forrester, three-sty brick building, w s McCulloh St., s of Laurens St.
 Wm. H. McDowell, three-sty brick building, n e cor. Chase and Wolfe Sts., fronting on Chase St.
 The Labor Report remains unchanged.

Boston.

BUILDING PERMITS.—Wood. — Washington St., No. 2215, Ward 19, for S. Goldsmith, store, 16' 6" x 50', one-sty flat; J. Goldsmith, builder.
 Baylson St., near Lamartine St., Ward 23, for Elizabeth Kling, dwell. and store, 25' x 41' 6", three-sty flat; Joseph Hammerle, builder.
 Baylson St., on line B. & P. R. R., Ward 23, for City of Boston, storage, 17' x 60', one-sty flat; Jas. McMarrow, builder.

Greco St., near Centre St., Ward 23, for Paul Lincoln, dwell., 14' 6" x 22' and 22' x 32', two-sty pitch; Joseph Hammerle, builder.
 Eaton Court, Ward 21, for Rose F. Hegarty, dwell., 21' 3" x 40', three-sty flat; Swett, builder.
 Hyde Park Ave., near Walk Hill St., Ward 23, for Miss A. N. McDonald, dwell., 23' and 30' x 33', two-sty mansard; Alexander Rogers, builder.

Brooklyn.

BUILDING PERMITS.—East River, 141' s Joralemon St., six-sty brick warehouse, gravel roof; cost, \$40,000; owner, Franklin Woodruff, 167 Rensen St.; architect and builder, Thomas Stowe.
 Central Ave., e s, 25' s Jefferson St., 2 three-sty frame dwellings, tin roofs; cost, each, \$3,900; owners, John Schaffer and Peter Geiser, 12 Central Ave.; architects, Vollweiler & Co., builder, J. Schreifer; carpenter, A. Amann.
 Locust St., s s, 100' e Broadway, front, four-sty frame tenement, tin roof; cost, \$5,000; owner, John Betz, 187 Hopkins St.; architects, Vollweiler & Co.

Central Ave., n w cor. Magnolia St., three-sty frame store and tenement, tin roof; cost, \$5,000; owner, Louis Kenschardt, 306 Central Ave.; architects, Vollweiler & Co.

Stanhope St., No. 129, s e s, about 150' n e Central Ave., two-sty frame dwell., tin roof; cost, \$3,000; owner, S. W. Johnson, 117 Stanhope St.; architect, E. F. Gaylor; mason, not selected; carpenters, Jenkins & Gillies.

Stagg St., Nos. 185 and 187, n s, about 200' e Graham Ave., 3 four-sty brick tenements, tin roofs; cost, each, \$5,500; owner, Hermann Reimers, Jr., 181 Stagg St.; architect, E. F. Gaylor; builders, John Auer and Jenkins & Gillies.

Stauben St., w s, 89' n DeKalb Ave., four-sty brick tenement, felt, cement and gravel roof; cost, \$8,500; owner, Mary A. McCormick, 98 North Eighth St.; architect, Amzi Hill.

Franklin St., s s, 56' s Eagle St.; three-sty frame store and tenement, tin roof; cost, \$3,500; owner, Henry Clark, 43 South Third St.; architect, F. Tyrrell.

Graham Ave., No. 431, w s, 25' s Front St., three-sty frame store and tenement, tin roof; cost, \$4,200; owner, Andrew J. Cook, 172 Richardson St.; architects and carpenters, Sammis & Bedford; masons, Doyle & Brazil.

Sackett St., No. 334, s s, about 180' e Court St., two-sty brick stable and dwell., gravel roof, wooden cornice; cost, \$3,000; owner and architect, Mr. Bevelin, 403 Clinton St.; builders, E. F. Crane and Perkins & Green.

Bond St., w s, 100' s Fulton St., 2 four-sty brick stores and tenements, gravel roofs; cost, each, \$10,000; owner, Aaron S. Robbins, 114 Sixth Ave.; architect and carpenter, Joseph Platte; masons, John Demott & Sons.

Greene Ave., n s, 410' e Bedford Ave., 3 three-sty brown-stone dwellings, tin roofs; cost, \$8,000 each; owner, Andrew Miller, 1377 Pacific St.; architect, Amzi Hill.

Hamilton Ave., No. 207, e s, 70' n Luquer St., two-sty brick store and dwell., gravel roof; cost, \$3,000; owner and builder, J. F. Nelson, 26 Manhattan Pl.

Dupont St., No. 136, s s, 175' e Manhattan Ave., three-sty frame tenement, tin roof; cost, \$3,200; owner, John Hoffer, on premises; architect, James B. Hanne; builders, John Hoffer and Post & Walker.

Park St., s s, 130' e Broadway, three-sty frame tenement, tin roof; cost, \$4,000; owner, Catharine Straub, 11 Lewis Ave.; architect, Th. Engelhardt; builder, Geo. Straub.

Bogart St., No. 25, w s, three-sty frame tenement, tin roof; cost, \$4,000; owner, Jos. Weidner, 39 Forrest St.; architect, Geo. Hillenbrand; builders, Hellmann & Wagner.

Bogart St., Nos. 27 and 29, w s, 50' n Varet St., 2 three-sty frame tenements, tin roofs; total cost, \$8,000; owners and builders, Hellmann & Wagner, 33 Bogart St.; architect, Geo. Hillenbrand.

Withers St., s s, 80' w Lorimer St., 2 three-sty frame tenements, tin roof; cost, \$3,000; owner, John N. Schumacher, cor. Withers and Lorimer Sts.; architect, N. Herbert; builders, M. Smith and C. Schneider.

Manhattan Ave., No. 507, four-sty brick store and tenement, tin roof; cost, about \$8,000; owner, Mrs. Mary Morgan, on premises; architect, James Mulhall; builders, John Hoffer and Stephen Randall.

Park Ave., No. 769, n s, 150' w Throop Ave., three-sty frame tenement; cost, \$4,200; owner, S. Schwarz, cor. Throop and Park Aves.; architect, Th. Engelhardt.

Van Buren St., n s, 153' 3" e Reid Ave., two-sty brown-stone dwell., tin roof; cost, about \$4,000; owner, G. Mariner, Brooklyn; builder, A. Miller.

Central Elevator Pier, on Furman St., about half-way between Wall and Fulton Ferries, one-sty frame freight-shed, gravel and felt roof; cost, \$5,500; owner, E. B. Bartlett & Co., 19 Old Slip, New York; builders, W. H. Hazzard's Son & Co.

Van Cott Ave., n e cor. Leonard St., four-sty brick store and tenement, tin roof; cost, \$10,000; owner, Frederick Inmann, 322 East Eleventh St.; architect, Julius Boeckel.

Cook St., n s, 140' w Bogart St., 3 three-sty frame tenements, tin roofs; cost, \$4,000; owner and builder, Geo. Loeffler, 244 Lynch St.; architect, J. Platte.

President St., No. 100, s s, rear, three-sty brick store and tenement, tin roof; cost, \$4,300; owner, Peter Duff, 254 President St.; builders, W. Smith and W. A. Furey.

Herkimer St., n s, 80' e Brooklyn Ave., two-sty brick dwell., tin roof; cost, \$3,500; owner, architect, and builder, Edward T. Kutan, 29 Herkimer St.

ALTERATIONS.—Fulton St., Nos. 317, 319 and 321, the extension of No. 321 raised three stories, interior alterations, etc.; cost, \$12,000; owner, Geo. A. Hurd, 33 Prospect Pl.; architect, C. E. Eisenach; builder, F. D. Norris.

Calvin Pl., No. 13, new front below second story and interior alterations; cost, \$3,000; owner, Wechsler & Abraham, 287 Fulton St.; architect, G. L. Morse.

Court St., No. 294, alter pitch of roof to centre, second, third and fourth floors rearranged; cost,

about \$3,500; owner, Henrietta Stewart, 222 Court St.; architect, F. E. Lockwood; builders, Chatterley and Thomas Harris.

Graham Ave., No. 356, raised four feet from story beneath, also three-sty frame extension; cost, \$3,000; owner, Henry Beals, 636 Greene Ave.; architect and builder, G. H. Garrison.

Broadway, s w cor. First St., interior alterations, etc.; cost, \$6,000; owner, First National Bank, Brooklyn, on premises; architects, Thayer & Robinson; builders, Thomas Gibbons and Jenkins & Gillies.
 Broadway, No. 135, three-sty brick extension, tin roof, new store front, iron-work; cost, \$3,000; owner, Mrs. Brown, 184 Hewes St.; builders, W. & T. Lamb, Jr., and Marinus & Gill.

Chicago.

HOUSES.—Wm. Strippelman, architect, has made plans for 6 houses, cor. Twenty-sixth St. and Portland Ave., Trenton brick and terra-cotta finish; cost, \$35,000; to be built in flats.

CHURCH.—Wm. Strippelman is architect for the African Methodist Episcopal Church, 41' x 90'; cost, \$10,000.

FACTORY.—Wm. Strippelman, architect, has planned the factory cor. Ashland Ave. and Arbor Pl., four-sty and basement, 50' x 120'; cost, \$16,000.

FLATS.—The three-sty flats to be built for Louis Weeber, 203 Walnut St., were planned by Wm. Strippelman, architect; Anderson pressed-brick and terra-cotta finish; cost, \$12,000.

BUILDING PERMITS.—A. F. Hale, two-sty dwell., 3308 Indiana Ave.; cost, \$7,000.

F. Hagerman, three-sty store and dwell., 1147 Milwaukee Ave.; cost, \$5,000.

Wm. Kerr, two-sty dwell., 265 Flourney St.; cost, \$2,500.

John G. Fuller, three-sty store and dwell., 172 Division St.; cost, \$7,000.

O. A. Cray, five-sty store, 17 and 19 Canal St.; cost, \$26,000; architect, J. M. Van Osdal; builders, Fox & Hinds.

Hansom Cab Co., two-sty barn, 203 to 207 South Clinton St.; cost, \$15,000; architects, Burling & Whitehouse; builders, McMillan & Bros.

L. Larson, two-sty flats, 309 West Ohio St.; cost, \$2,500.

Geo. K. & McClain, four-sty stores and flats, 115 and 117 Fourth Ave.; cost, \$15,000; architect, H. Rohwold; builder, F. Hansen.

Turner & Bond, 6 one-and-one-half-sty cottages, 520 to 530 Idaho St.; cost, \$12,000.

M. Kabal, two-sty store and dwell., 837 Allport St.; cost, \$3,500.

A. McNally, two-sty dwell., 836 North Clark St.; cost, \$3,000.

S. C. McDowell, two-sty dwell., 290 North State St.; cost, \$3,500.

Chicago & North-western Railroad Co., freight-house, State St. and the river; cost, \$20,000.

John Ford, three-sty store and flats, 667 Indiana St.; cost, \$3,500.

Louis Weeber, three-sty flats, 203 Walnut St.; cost, \$12,000; architect, W. Strippelman; builders, Wilkie & Holman.

Thos. Macklin, three-sty flats, 239 Illinois St.; cost, \$17,000.

C. B. Kimball, two-sty dwell., 173 Park Ave.; cost, \$8,000.

J. Prochazka, three-sty dwell., 244 Maxwell St.; cost, \$4,000.

J. Gresen, two-sty dwell., 138 Henry St.; cost, \$10,000; architect, F. W. Kuehl; builder, J. G. Lobstein.

J. Jansen, 3 cottages, 752-762 Shober St.; cost, \$5,000.

Unity Church Industrial School, two-sty school-house, Elm St., cor. Chatham St.; cost, \$6,000.

W. H. Davis, 3 cottages, 122 to 130 Lexington St.; cost, \$3,000.

Cleveland.

STORES.—Brick block on St. Clair St., for H. B. Payne; cost, \$75,000; Walter Blythe, architect.

Brick block on Woodland Ave., for the Evangelical Association; cost, \$30,000; J. M. Blackburn, architect.

Brick block on Bond St., for L. E. Holden; cost, \$45,000; Coburn & Barnum, architects.

MILL.—Rolling-mill in the Eighteenth Ward, for the Union Rolling Mill Co.; cost, \$15,000; Jno. T. Waterson, contractor.

New York.

HOUSES.—On Eighty-fourth St., between Fifth and Madison Aves., two dwellings, 25' x 90', are to be built by Philip Braender.

STORES.—It is reported that the St. Nicholas Hotel is to be torn down and the site covered with stores, from designs of Mr. S. A. Warner.

THEATRE.—A new theatre is to be built on the Bowery, by John A. Stevens, late lessee of the "Windsor," the site of which is to be built on for a hotel.

BUILDING PERMITS.—One Hundred and Forty-fourth St., opposite Ryder Ave., one-sty frame stable, gravel roof; cost, \$2,500; owner, Jacob R. Wilkins, One Hundred and Fifty-eighth St., cor. Third Ave.; architect, R. F. Hall.

Bowery, n e cor. Grand St., five-sty and basement brick first-class store, metal roof; cost, \$45,000; owner, C. L. Wolfe, by J. M. Jackson, 3 Mercer St., agent; architect, J. B. Snook.

Fourth Ave., w s, 98' n Twenty-third St., four-sty brick stores and theatre, tin roof; cost, \$30,000; owner, Lyscum Company, 19 East Twenty-eighth St.; architects, Hubert, Pirson & Co.

Eighty-fourth St., s s, 36' 6" e Lexington Ave., 2 five-sty brick tenements, tin roof; cost, total, \$35,000; owner, Thomas A. Martin, Astoria; architect, John McIntyre.

Bayard St., s e cor. Mulberry St., five-sty brick tenement, tin roof; cost, \$10,000; owner, Harris Baum, 1498 Third Ave.; architect, W. Graul.

Bayard St., s s, 25' e Mulberry St., 3 five-sty brick tenements, tin roofs; cost, each, \$8,000; owner, Harris Baum, 1498 Third Ave.; architect, W. Graul.

Seventy-ninth St., s s, 219' e First Ave., 4 five-sty brick and brown-stone tenements, tin roofs; cost, each, \$18,000; owners, John Gaynor and Matthew C.

Henry, of M. C. Henry & Co., Seventy-ninth St., cor. Ave. A.

Forty-seventh St., s s, 100' x Tenth Ave., 3 five-sty brown-stone apartment-houses, tin roofs; cost, each, \$22,000; owner of easterly house, William Curry, and of other two, Gillie & Walker, by James B. Gillie, 407 West Fifty-fourth St.; architect, M. L. Unglich.

One Hundred and Fourteenth St., s s, 175' w First Ave., five-sty brick and brown-stone trimmed tenement, tin roof; cost, \$13,500; owner, Wm. Fernschild, 324 East One Hundred and Fourteenth St.; architect, Geo. J. Fernschild.

Greene St., s e cor. Bleecker St., seven-sty brick, iron and stone-front warehouse, tin roof; cost, \$225,000; owner, Isidor Cohnfeld, 56 West Fifty-seventh St.; architect, Alfred Zucker.

Sherman Ave., e s and w s, from One Hundred and Sixty-third to One Hundred and Sixty-fourth St., 53 three-sty brick dwellings, tin roofs; cost, each, \$2,000; owner, Geo. W. Van Siclen, President, 99 Nassau St.; architect, G. A. Schellenger.

East Broadway, No. 167, five-sty brick tenement, metal roof; cost, \$15,000; owner, David Korn, 154 East Sixty-sixth St.; architect, Jno. B. Snook.

First Ave., s w cor. Seventy-sixth St., 5 five-sty brick, brown-stone front tenements and stores, tin roofs; cost, each, \$18,500; owner, Eva Muller, 446 East Seventy-sixth St.; architect, John Brandt; builder, Geo. Muller.

West Sixty-fourth St., No. 505, five-sty brick tenement, tin roof; cost, \$14,000; owner, Michael Egner, 503 West Sixty-fourth St.; architect, C. F. Ridder, Jr.

Broad St., No. 81, five-sty brick tenement and store, tin roof; cost, \$14,500; owner, Henry L. Meyer, n e cor. Beekman and Pearl Sts.; architect, C. F. Ridder, Jr.

Canal St., No. 503, four-sty brick store, tin roof; cost, \$6,000; owner, William S. Maddock, 120 Broadway; architects, MacLay & Davies; builders, Jenkin Jones and Jas. H. Banta.

South Fifth St., No. 101, five-sty brick tenement and store, tin roof; cost, \$15,000; owner, Charles H. Otto, 157 Prince St.; architect, Wm. Kuhles; builders, H. Brockmeyer and H. Tietjen.

Tenth Ave., Nos. 203 and 205, 2 five-sty brick tenements and stores, tin roofs; cost, \$16,500 and \$19,000; owner, Jacob Appell, 277 West Twenty-third St.; architect, Geo. B. Pelham; builders, Van Dolsen & Arnott.

Twenty-second St., n s, 74' w Tenth Ave., five-sty brick tenement, tin roof; cost, \$14,500; owner, architect and builders, same as last.

Fifth Ave., e s, 59' w Eighty-sixth St., 4 four-sty brown-stone front dwellings, tin roofs; cost, each, \$48,000; owner, Joseph Schwarzer, 172 East Eighty-sixth St.; architects, Thom & Wilson.

Fourth Ave., s e cor. Seventy-ninth St., 6 four-sty brown-stone front dwellings, tin roofs; cost, each, \$25,000; owner, James A. Frame, 105 East Seventy-ninth St.; builders, Thom & Wilson.

West Twenty-first St., No. 221, five-sty brown-stone flat, tin roof; cost, \$25,000; owner, Peter Farley, 260 West Fifty-third St.; architects, Thom & Wilson.

Fifty-eighth St., s s, 200' w Sixth Ave., 3 four-sty brown-stone front dwellings, tin roofs; cost, each, \$13,000; owner and architect, Fred. Rosenberg, 419 Clermont Ave., Brooklyn; builders, J. & L. Weber.

Seventy-seventh St., n s, 74' w Third Ave., five-sty brick tenement and store, tin roof; cost, \$17,000; owner, H. Siefke, 291 East Seventy-seventh St.; architect, H. J. Dudley.

Seventy-first St., s s, 350' w Ninth Ave., 5 four-sty brown-stone front dwellings, tin and slate roofs; cost, each, \$17,000; owner, Edward J. King, 426 Broome St.; architects, D. & J. Jardine; builder, I. A. Hopper.

Sedgwick Ave., w s, 700' s Morris Dock Station, three-sty frame dwell., slate and tin roof; cost, \$3,500; owner, Thos. R. Thorn, 439 East Eighty-eighth St.; architect, E. M. Fowler; builder, John Knox.

Broadway, No. 641, and Mercer St., No. 210, two-sty brick store, tin roof; cost, \$13,000; owners, R. & O. Goeliet, 561 and 608 Fifth Ave.; architect and builder, M. Reid.

Fortieth St., s s, 141' e First Ave., one-sty brick engine and condenser house, slate roof; cost, \$14,500; owner, Equitable Gas-Light Co., Post Building, Exchange Pl.; architect, John F. Harrison; builder, Richard Deeves.

ALTERATIONS. — Sixth Ave., No. 662, repair damage by fire; cost, \$3,300; owner, Emelia E. Michel, on premises; architect and builder, H. Wallace.

Eighth Ave., No. 570, n e cor. Thirty-eighth St., three-sty brick extension and second and third stories altered; cost, \$3,500; owner, Ed. Pfaff, 253 West Thirty-eighth St.; architect, W. Kuhles.

East Forty-third St., Nos. 204 and 206, add one story; cost, \$3,000; owner, architect and builder, Cornelius O'Reilly, 100 East Forty-fifth St., for O'Reilly Bros.

East Broadway, No. 193, add one story, also one-sty brick extension, tin roof; cost, \$3,500; owner, Isaac Wolf, on premises; architect, W. C. Rath.

Grand St., No. 454, two-sty brick extension, tin roof; also interior alterations, first story; cost, \$4,000; owner, Joseph Wolf, 434 Grand St.; architect, E. W. Gries; builders, C. Lochman and Wm. Klein.

West Tenth St., No. 153, altered for store and dwell., etc., iron-work; cost, \$5,000; owner, Arnold J. D. Wedemeyer, 25 Perry St.; builders, M. Reed and J. F. Langan.

John St., No. 83, add one sty, etc.; cost, \$7,500; lessees, Kidder & Laird, by G. W. Laird, Shady Side, N. J.; architect, W. A. Mundell; builders, T. Dobbin and I. B. Jacobs.

East Sixty-sixth St., No. 61, one and part three sty brick extension; cost, \$3,500; owner, Theodore Schumacher, on premises; architect, J. Boeckell.

Broad St., No. 59, first story to be altered for store purposes, new front, etc.; cost, \$4,000; lessees, Hollister, Craue & Co., on premises; architect, Ferdinand Fish; carpenter, Wm. D. Peck.

Lexington Ave., No. 770, raise one sty; cost, \$5,000; owner, Martin B. Brown, on premises; architects, Babcock & McAvoy; builder, not selected.

Eighth Ave., No. 488, raise walls three feet, and

build a one and part two sty brick extension, new store front and interior alterations; cost, \$6,000; owner, August Schneider, 516 Eighth Ave.; architect, Jos. M. Dunn.

Park Ave., No. 39, raise top story four feet, and a three-sty brick extension and interior alterations; cost, \$22,000; owner, Geo. S. Bowdoin, cor. Wall and Broad Sts.

Greenwich Ave., No. 27, four-sty and basement brick extension and interior alterations; cost, \$10,000; owner, Frederick Fink, 106 Washington Pl.; builder, John Jordan.

Ninth Ave., n e cor. Thirteenth St., internal alterations and repairs; cost, \$7,000; owner, J. S. Eldridge, 830 Ninth Ave.; architect, Jos. Esterbrook, Jr.

East One Hundred and Twenty-fourth St., No. 109, build cellar walls under front and rear buildings, and brick extension; cost, \$3,500; owner, W. L. Chester, on premises; builders, Wm. Haw and Jas. E. Poole.

East Forty-ninth St., No. 258, lower floor of first story, and interior alterations, etc.; cost, \$4,000; owner, Ferdinand Olivat; architect, Wm. Kuhles.

PHILADELPHIA.

HOUSE. — W. F. Fray, Esq., contemplates building a country house on Old York Road, to be 60' front, first story stone, second story timber; plans by Hazlehurst & Huckel, architects.

BUILDING PERMITS. — Ridge Ave., cor. Willow St., rebuilding building, 60' x 100'; Knickerbocker Ice Co., owners.

Tahassa St., No. 910, two-sty dwell., 16' x 44'; L. K. Silfer, owner.

Somerville St., between York Road and Wister St., two-sty dwell., 16' x 45'; W. Garvin, contractor.

South Eighth St., No. 1628, three-sty store and dwell., 16' x 40'; W. J. Doyle, owner.

Federal St., No. 128, two-sty stable, 18' x 34'; Chas. Conner, owner.

Gray's Ferry Road, Nos. 2706 and 2708, 2 three-sty stores and dwellings, 16' x 50'; Michael McGouch.

Moore St., Nos. 221 and 223, two-sty dwellings, 16' x 40'; L. T. Franks, owner.

Fifteenth St., n e cor. Westmoreland St., two-sty dwell., 14' x 40'; Jno. Stoll, owner.

Randolph St., s of Poplar St., 3 three-sty dwellings, 16' x 38'; S. S. Meyers, owner.

Twentieth St., n e cor. Garrett St., 2 two-sty dwellings, 17' x 40'; M. Kennedy, owner.

Franklin St., No. 616, third story addition to dwell., 16' x 30'; R. E. Kiley, contractor.

Township Line, opposite Gowen Ave., third story addition to main building, 28' x 40'; and addition to back building, 12' x 44'; Isaac K. Plurson, contractor.

Orkney St., between Cumberland and Huntingdon Sts., 15 two-sty dwellings, 14' x 25'; F. Lambrecht.

Lawrence St., between Cumberland and Huntingdon Sts., 13 two-sty dwellings, 15' x 28'; F. Lambrecht.

North Fifth St., No. 3639, three-sty front building, 16' x 22'; James Dutt, contractor.

North Sixteenth St., No. 718, three-sty front building, 17' x 28'; G. S. Moore, contractor.

North Sixteenth St., two-sty store and dwell., 18' x 28'; Robert Houston, owner.

Mifflin St., w of Sixth St., 4 two-sty dwellings, 16' x 30'; Andrew Miller, owner.

Reed St., w of Twentieth St., 4 two-sty dwellings, 20' x 21'; T. C. Rorke & Son, owners.

Guard Ave., n w cor. Darien St., four-sty brick building, 13' x 30'; Thos. Bradley & Co.

North Ninth St., Nos. 1613 to 1625, three-sty factory, 64' x 100'; and annex, 21' x 30'; Mahlon Fulton, owner.

Germantown Ave., No. 2641, three-sty dwell., 23' x 70'; John Mander, owner.

Clarion St., cor. Reed St., two-sty dwell., 18' x 60'; C. H. Jacoby, contractor.

Fifteenth St., cor. Wood St., second-sty addition to foundry, 20' x 45'; W. Thomson & Bro.

Thompson St., cor. Marlborough St., front altered and three-sty back building, 17' x 25'; Jno. Yoelle, contractor.

Market St., No. 907, front altered and two-sty back building, 18' x 72'; Chas. Beltermiller, Jr.

Orrianna St., s of Lehigh Ave., two-sty dwell., 16' x 34'; Chas. Booth, contractor.

Woodvale St., near Ridge Ave., 2 two-sty dwellings, 16' x 30'; Jas. Sutcliffe, owner.

Thirty-fourth St., near Powelton Ave., Mr. Geo. A. Fletcher will build a dwelling-house, two stories high, with an English roof (bricks, shingle and slate); from plans by Addison Hutton, architect.

WASHINGTON, D. C.

BUILDING PERMITS. — The following permits for new buildings worth \$3,000 and over since last report: — Eighth St., between K and L Sts., n w, three-sty brick dwell., for Horatio Moran; cost, \$6,000; Jas. H. McGill, architect.

Fourth St., between A and B Sts., s e, 2 three-sty brick dwellings, for Jno. G. Nicholas; cost, \$6,000; Owen Donnelly, builder.

I St., between North Capitol and First Sts., n w, two-sty brick dwell., for A. B. Coppes; cost, \$3,000; S. R. Turner, architect.

Rhode Island Ave., between Fourteenth and Fifteenth Sts., n w, three-sty brick dwell., for Com. J. H. Upshur, U. S. N.; cost, \$18,000; F. C. Withers, of New York, architect; Langley & Gettinger, builders.

PROPOSALS.

FURNITURE.

[At Philadelphia, Pa.]

TREASURY DEPARTMENT,
OFFICE OF THE SECRETARY,
WASHINGTON, D. C., February 13, 1884.

Sealed proposals will be received at this office until 2 o'clock, of Monday, March 10, 1884, for manufacturing, delivering and placing in position in complete working order certain furniture for the new

PROPOSALS.

United States Court-House and Post-Office building at Philadelphia, Pa.

Upon application to this office detailed information will be furnished to furniture manufacturers desiring to submit proposals. The Department reserves the right to reject any or all bids, or parts of any bid, and to waive defects.

CHAS. J. FOLGER,
Secretary.

COURT-HOUSE.

[At Purdy, Tenn.]

Sealed proposals will be received until March 20, 1884, for building a court-house at Purdy, McNairy County, Tenn.

Bids will be considered, whether on the entire job or separately, on all masonry, including excavating, grading, plastering, cast-iron door and window sills and door-steps as one part; the carpenter's work as another part; the tin and galvanized-iron as another.

In all cases all materials to be furnished by contractor, and all necessary painting included.

Plans and specifications may be seen by calling on J. P. Prince, Secretary, Purdy, Tenn.

The Committee reserves the right to reject any or all bids.

Proposals should be plain and specific, sealed, and marked "Bids on Building Court-House."

Address all communications to

J. P. PRINCE, Secretary.

BRIDGE.

[Near Cleves, O.]

Sealed proposals will be received at the office of the County Commissioners of Hamilton County, Ohio, until Saturday, March 23, 1884, at 12 M., for building a bridge across the Miami River, near Cleves, O.

The superstructure will be of iron, and be composed of three equal spans. Distance from face to face of abutments, 194 feet.

Masonry will consist in building two piers and two abutments.

All work to be done according to plans, specifications and profile now on file in the office of said County Commissioners.

Separate bids will be received on superstructure and masonry.

All builders will be required to furnish a guaranty that, within ten days after the notification of the award of the contract, the contract shall be entered into.

The right to reject any or all bids is reserved.

JOSEPH W. BLEWSTER,
County Auditor.

IRON.

[At New York, N. Y.]

NAVY PAY OFFICE, 27 STATE STREET,
NEW YORK, February 15, 1884.

Proposals, sealed, and endorsed on envelope "Bid for Supplies Advertised," will be received at this office until 12 o'clock, March 4, 1884, for the following supplies of the best quality, to be delivered within thirty days from date of order, free of expense, at the Navy-Yard, New York, Bureau Construction and Repair:

131,838 pounds angle-iron.
4,944 pounds channel-iron.
8,175 pounds T-bulb beam-iron.

312 pounds T-iron.
56,464 pounds steel plate.
17,749 pounds plate-iron best fire-box, C. H. No. 1 flange.

50,877 pounds plate-iron, C. H. No. 1 flange.
246,180 pounds plate-iron, best refined No. 1.
23,444 pounds iron rivets, button head.

1,600 pounds iron rivets, countersunk heads.
3,900 pounds steel rivets, countersunk heads.
226 pounds wrought-iron welded tubes.

All to be as per schedule and specifications, which can be seen at this office.

The right is reserved to reject any or all bids that may not be deemed advantageous to the Government.

Two responsible sureties required for the prompt and faithful delivery of the supplies awarded.

Blank forms will be furnished at this office. Bids not properly signed and certified will not be considered.

THOMAS T. CANWELL,
Pay Inspector U. S. Navy.

BUILDING MATERIALS.

[At Philadelphia, Pa.]

Sealed proposals will be received at the office of the Commissioners, in the Buildings, until noon of Tuesday, March 4, 1884, to furnish and set in place, complete, all the wrought, rolled and cast iron and slate required for the roofs of the north centre pavilion and wings, girders and beams for two floors in clock-tower, cast-iron gutters in centre pavilions in court-yard, gutters on main cornice of east and west centre pavilions, wrought-iron clamps and ties.

Also, for granite copings for the areas of the east and west fronts, granite sills and platforms for east centre pavilion and around the northeast and northwest corner pavilions, granite bearing blocks for roof trusses.

Also, all bricks and brickwork (except brickwork of clock-tower), cement, lumber, and coal required during this present year.

Proposals for cement must state the brand and weight per barrel, and must be accompanied by samples from which tests can be made.

No proposals will be considered unless the same are from persons directly in the business of manufacturing and furnishing the materials and labor bid for, and possessing in their own name the facilities necessary for a compliance with their proposals.

Full particulars as to form and requirement of the proposals, with the necessary blanks, may be had on application to the office of the architect, in the building, between the hours of 10 A. M. and 3 P. M.

The Commissioners reserve the right to reject any and all bids.

By order of the Commissioners.

SAMUEL C. PERKINS, President.

Attest: F. DE HAES JANVIER, Secretary.

THE AMERICAN ARCHITECT AND BUILDING NEWS

ADVERTISERS' TRADE SUPPLEMENT.

No. 21.

SATURDAY, MARCH 1, 1884.

VOLUME XX.
No. 47.

THE UNITED STATES ENCAUSTIC TILE WORKS.

GROWTH AND PROGRESS OF AN IMPORTANT ENTERPRISE.

THE manufacture of tile is of very ancient date. Its origin, indeed, is prehistoric. Tile, both plain and ornamented, are found in the ruins of Egypt and Assyria, of Greece and Italy, used for all sorts of domestic and architectural purposes, as well as in some instances for records.

Much of our knowledge of Assyrian history is derived from inscriptions on the tiles and clay cylinders made by the same method. The Romans, particularly, showed great art in their manufacture, and used them extensively. Unlike many articles of antiquity the tile has held its own throughout the centuries, and has been produced with varying skill and art by many nations, sometimes only for the substantial purpose of roofing or making drains, but oftener for purposes of ornamentation, as shown in hearths, chimney-pieces, mosaic pavements, and wainscoting of houses.

With the comparatively recent revival of interest in household decoration, and especially its development in this country, the tile has leaped into popular favor, and scarcely a house of any value is built into whose construction it does not enter, while there are few possessing any ornaments in which it does not have a representative.

Few processes of manufacture are more interesting or, despite apparent simplicity, more complicated.

The utmost care is taken at every stage—in the selection of material and its proper handling, until the finished article is laid upon the warehouse shelf.

The preparation required for the manufacture of tile on a large scale is very great; much costly machinery is needed, many skilled workmen, artistic taste of a high order, both for forming patterns and designing plans for use of the product, added to which there must be great commercial ability to dispose of the

wares, and to operate and maintain a large establishment successfully; such a one as is located at Indianapolis, Indiana.

The United States Encaustic Tile Company is little more than six years old, but owing to the enterprise and far-seeing ability of its managers has grown unprecedentedly, and has become known far and wide as the largest encaustic and majolica tile works in the United States.

Starting with the idea that the tiles could be made profitably in this country, and being within easy access of fine clays adapted to the purpose, the Company erected substantial buildings, with kilns and proper machinery, and procured a number of skilled workmen from England. The tiles produced are not

very large contracts, one being the State-House at Des Moines, Iowa, and the other the Custom-House and Post-Office at St. Louis, Mo. Among the many contracts now on hand might be mentioned the new Government building at Topeka, Kansas, three Court-Houses in Indiana, one in Illinois, a large State building at Columbus, O., containing over 40,000 square feet, a large six-story apartment-house, also a fine residence at Cleveland, O., the Navarro Apartment-Houses, fronting on Central Park, New York, one of the largest buildings of the kind in the country, and ten national banks located in different parts of the country.

Tile dealers throughout the country are beginning to realize that it is no longer necessary to send their orders abroad for tiles, and are now placing them with this Company, where they obtain better goods and at much lower prices.

Contractors and builders will find it greatly to their advantage to write to the Company for estimates before purchasing elsewhere.

The Company would solicit correspondence with architects who may desire information regarding prices, and the practicability of using tiles. Designs and estimates will be fur-

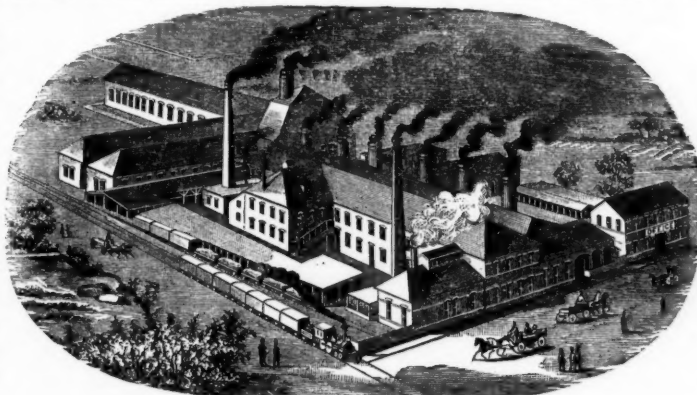
nished free upon application.

UNITED STATES ENCAUSTIC TILE CO.,
INDIANAPOLIS, IND.

A SUPERIOR MATERIAL FOR THE FINISH OF WALLS AND CEILINGS, LAYING BRICK, ETC.

THE objections to the various materials hitherto used in the finish of walls and ceilings of buildings are well-known, and numerous have been the attempts to remedy the difficulty, but without special success until the introduction of the article known as Arroquier & Barrett's "Patent Soapstone Finish," manufactured by the American Soapstone Finish Company, of Providence, R. I.

This material is designed for application to the walls and ceilings of buildings in place of



United States Encaustic Tile Co.'s Works.

excelled by any manufactory in the world. During the past year the Company has entered largely into the manufacture of high-art majolica tiles for mantel-facings, hearths, wainscoting and ornamental purposes.

The product of the factory is found in every State, and in hundreds of public buildings. The increasing demand for these goods has made it necessary for the Company to greatly enlarge their works. Recently, extensive additions have been made in buildings, kilns, presses and other machinery, until now they cover several acres of ground, and have a capacity of over 2,000,000 square feet per annum.

The Company employ nearly four hundred hands, and expect to double that number during the year. They have just completed two

plaster-of-Paris or sand finish, to which it is greatly superior for many reasons. Among its advantages are the following: It will not chip-crack, is applied with less labor, involves no loss of material in gauging, can be painted or papered at less cost, is a non-absorbent and non-conductor, is impermeable to gases, stains, or germs of disease, can be washed without injury, is pleasanter to the eye than the glaring white of ordinary finish, does not become discolored with age, but improves in tone and clearness; presents the finest surface for papering, or painting in oil or water-colors; is preferred by carpenters, as it is less liable to injury when nailing onto the finish; and its cost compares favorably with that of other kinds of finish.

It is also supplied, ready mixed, in various colors, red, blue, drab, etc. It makes a beautiful surface, and the color is permanent. The Soapstone Finish has been used for more than four years past on churches, school-houses, hotels, public buildings and private residences. It is highly recommended by leading architects, builders, masons and contractors, and the Company have received many testimonials speaking in the highest terms of its superiority.

Among other buildings upon which it has been used may be named the Rhode Island Hospital, North Congregational Church, and the residence of the Hon. George H. Corliss, Providence, R. I.; Sea View Hotel, Block Island, R. I.; school buildings in Pawtucket, R. I., and Worcester, Mass.; the Phillips Academy, Andover, Mass.; New England Hospital, Jamaica Plain, Mass.; Public Library, Webster, Mass.; Catholic Orphan Asylum, Worcester, Mass.; the Wood Building, Fourth and Chestnut Streets, Philadelphia; the residence of Dr. H. T. Farnham, New York city; Tweddle Hall Building, Albany; Mann Building, Utica, N. Y., etc.

They also manufacture the Potter colored mortar, which makes a close, strong joint for brickwork, and being unaffected by heat, gases or exposure to the weather, is well adapted for use in chimney tops and fire-places, and for laying up fire-brick. It is also desirable for brick fronts, making a strong and durable joint. For this purpose it is furnished in red, black, brown and buff colors.

In addition to the above specialty the Company also manufacture "The Potter Blackboard," which is a plastic material to be applied to the wall in the same manner as ordinary hard-finish. It makes a perfectly smooth, durable surface, which takes the chalk readily and from which the marks are easily erased. It is very economical and can be quickly and easily applied.

The Potter Blackboard has been adopted in the public schools in many cities and towns, and is highly approved by school superintendents and boards of education wherever used.

Any desired information regarding this material can be obtained by addressing the

AMERICAN SOAPSTONE FINISH CO.,

Office 26 Exchange Place, Providence, R. I.
P. O. Box 26.

ANNOUNCEMENT.

CHICAGO, February 8, 1884.

At a meeting of The Ottawa Tile Company, held this day, the name of this corporation was changed to Pioneer Fire-Proof Construction Company. We take this opportunity to inform the architectural profession, and our patrons generally, of the change which we have found necessary, to bring clearly before

the public the actual nature of the business in which we are engaged.

Fire-proofing of buildings is our specialty, and the profession to which we have devoted years of time and practical experiment.

The early association of the present management with Mr. Geo. H. Johnson, who was the pioneer in the introduction of the Hollow-Tile system of fire-proofing in the Western States, has suggested to us the name we have adopted as being appropriate.

The business will be conducted by the same management as heretofore, the same being under the direction of our General Manager, Mr. E. V. Johnson, and a continuance of past favors from the architectural and building profession is respectfully solicited.

PIONEER FIRE-PROOF CONSTRUCTION CO.,
32 METROPOLITAN BLOCK, CHICAGO, ILL.

HYDRAULIC ELEVATORS.

In these days of tall buildings the question of how to reach the upper stories is an important one, and in consequence we find a large share of mechanical skill has been devoted to perfecting elevators. Elias Brewer has devoted his energies to the production of a safe, economical and easily-managed machine, adapted to use in private houses, hotels and office-buildings, stores, etc. One feature claimed by him for this elevator is that it does not require the constant attendance of a man to run it, but can be run by the passengers with perfect safety. The doors at each landing are so arranged that they are locked and unlocked by the elevator, and they cannot be opened until the elevator is on a level with the landing or floors, so that there is no danger of accident from falling through the open hatchway. The starting rope is so arranged that the elevator can be operated from any floor, and brought to the floor on which the person may be desiring to use it; and when it arrives

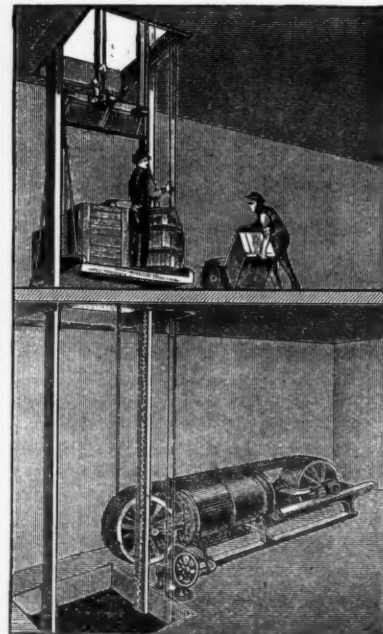


Fig. 1.

at the floor, and is on a level with it the door may be opened, but not before the elevator has operated on the lock. In addition to this Mr. Brewer manufactures hydraulic machines to suit all sorts of localities where you cannot dig a pit for an upright machine in the cellar.

Where the cellar is very low he makes horizontal machines that you can place outside of a building if there is no room inside, as shown in Figure 1. He also makes hydraulic dumb-waiters on this same principle to work either

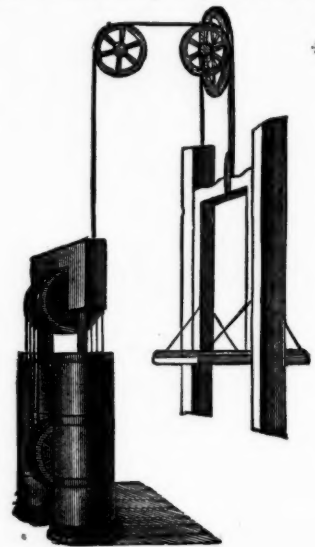


Fig. 2.

uprightly or horizontally to suit any place. They stop automatically at top and bottom.

Figure 2 represents a two-cylinder machine working uprightly with freight car; it is used for both freight and passenger purposes. A little boy eight years old can start it and stop it. Mr. Brewer has safety appliances of his own invention which he applies to each of his elevators. The Boston city officials have tested every one of the Brewer safety devices, of which a record can be had at the old State House, Boston, Mass. He also manufactures hand elevators, with the latest invented automatic brake to hold the load or car in any position from descending, and yet has no interference with the ascension of the elevator. Mr. Brewer is thoroughly practical, and has all the facilities necessary to secure excellent workmanship and despatch in filling orders. Those interested in the subject or about to purchase an elevator will do well to send for circulars to

E. BREWER,
267 FEDERAL ST., BOSTON, MASS.

WATER-COLORS.

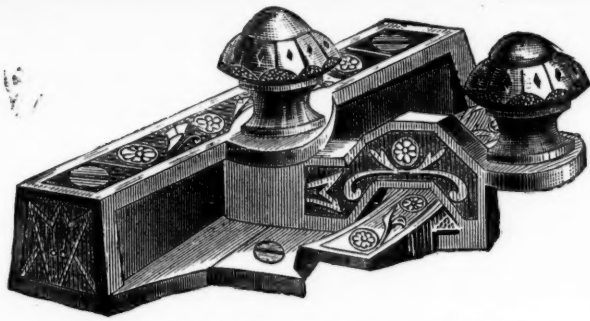
ARCHITECTS and Designers in water-colors will be interested to learn that the G. Wagner Water-Colors have received the first prize Gold Medal at the Boston Foreign Exhibition, which closed a short time ago.

The prize was awarded for general excellence, and to judge from the numerous testimonials of the leading artists, now before us, the quality of the G. Wagner's Water-Colors is not only equal but in many respects superior to that of other known colors, such as Windsor & Newton's and others.

Besides in the well-known styles such as moist in tubes and half-moist in pans, the Wagner Colors are also put up dry in cylinders, a method which is entirely novel and of great convenience to those who use the water-colors dry, being a great improvement on the old-style cakes.

The American agents for the above colors, who will be glad to give any further information that might be desired, and who have always a completely assorted stock on hand, are

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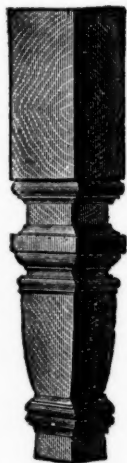
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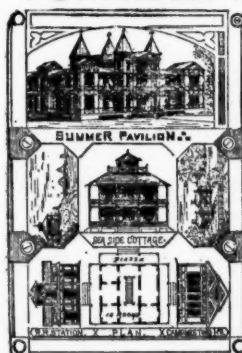


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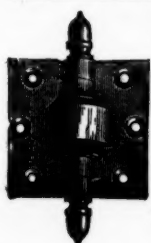
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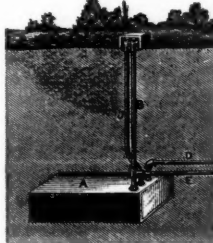
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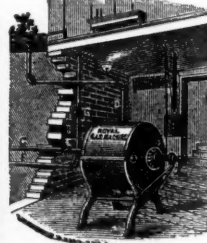
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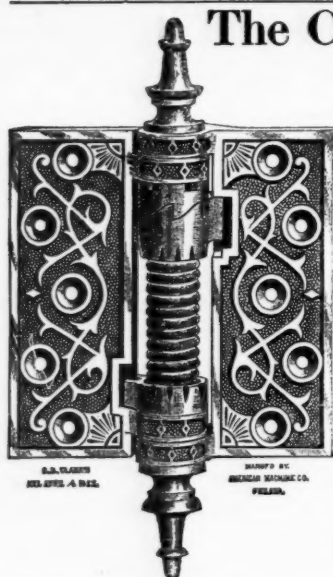
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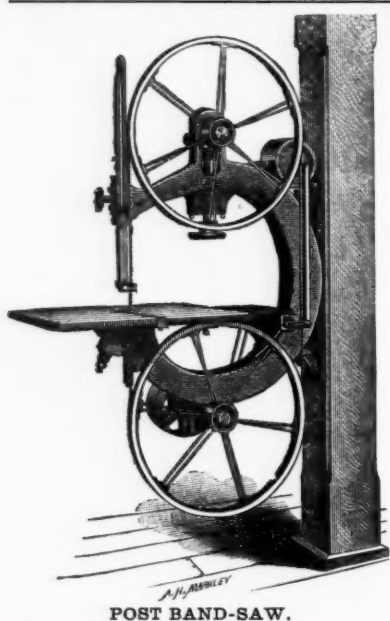
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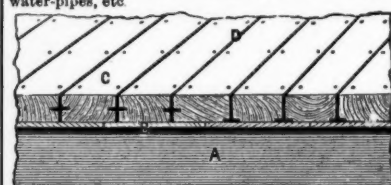
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Patented June, 1882.

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