

DECEMBER 22, 1883.

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

CONTENTS.

SUMMARY:—

The Tariff on Works of Art and Spurious Antiquities.—Iron and Concrete Construction.—New Classes formed at the New York Trades School.—Hospitals.—Proposed Formation of an Indianapolis Chapter, A. I. A.—The New York <i>Herald</i> advertises on Government Property.—Mr. William Morris and the Democratic Federation.—The Ownership of Building Materials delivered on the Building Site.—The Result of Ventilating Grease-Traps.—The Responsibility for Fires in France.	289
SPANISH ARCHITECTURE.—VI.	291
FIFTY-FOURTH ANNUAL EXHIBITION OF THE PENNSYLVANIA ACADEMY.	293
SANITARY PLUMBING.—XIII.	294
THE ILLUSTRATIONS:—	
House at Longwood, Mass.—House near Pittsburgh, Pa.—House at Delhi, O.—Sketch for a Stable.	295
LECTURES ON ARCHITECTURE.—VIII.	295
THE DUTIES OF THE ARCHITECT.	296
COMMUNICATIONS:—	
Paper and Concrete Chimneys.—Brick Piers.	298

A NOVEL point is raised by the New York *Evening Post* in regard to the bills introduced into Congress by Mr. Belmont, repealing the duties upon works of art, and also upon "classical antiquities," the latter term being explained in the bill to mean "all articles produced before or during the mediæval period." There is no doubt that the free importation of the beautiful and sensible manufactures of the Middle Ages and of antiquity would do much to improve our own art, but, as the *Evening Post* observes, there is at present a large number of establishments in Europe devoted to the production of "mediæval articles," to say nothing of those which turn out Greek, Roman and Egyptian antiquities in such profusion; and there may be some question whether the goods sent out by these factories ought to be admitted to this country on the same terms as those which they counterfeit, or, if not, whether the average custom-house inspector would have enough knowledge of the difference between the real and the false antiquities to prevent him from being imposed upon. Even under these circumstances, however, the abolition of the duty would be beneficial, for although it may or may not be desirable to allow the French or German workman of to-day to send us his wood and metal furniture on the same terms as those under which we import those made by his ancestors, it is certain that the exclusion of all foreign furniture except that really made before the year 1500, or so nearly like it as not to be distinguishable from it, would materially improve the taste of those who look abroad for their models of such things.

AN interesting discussion is going on in some of the foreign technical journals in regard to the use of iron in connection with concrete. The defects as a building material of concrete, used alone, are well known, and the idea of counteracting its brittleness and want of tensile strength by combining it with iron is not entirely new. Some ten years ago the well-known inventor, Mr. Thaddeus Hyatt, observing that the coefficient of expansion by heat was nearly the same for Portland cement concrete as for iron, devised a method for making concrete beams, having in the lower portion, which would be subjected to a tensile strain, iron bars, armed with cross-pieces, to give them a firmer hold of the concrete. These bars supplied tensile strength just where it was wanted, and by regulating the number of bars in such a way as to make the tensile resistance of the lower half of the beam nearly equal to the resistance to crushing of the simple concrete forming the upper half, a very strong beam was formed, which would retain its qualities under the action of great heat. Various modifications of this structure were tried by Mr. Hyatt, and a most interesting pamphlet was published by him on the subject, but, for some reason, the invention does not seem to have met with success. More recently, it has been proposed to bind together masses of concrete by mixing iron wire into the soft material, as hair is added to plastering mortar to keep it from crumbling away from the laths. On the whole, the latter suggestion seems less sensible and scientific than the earlier one, and it is much to be wished that further experiments might be made upon a combi-

nation of materials which seems likely some time to be of great importance.

WE do not apologize for making frequent reference to the development of the invaluable schools for industrial instruction which are now well established in New York. Our readers have already heard of the classes in fresco-painting, wood-turning and pattern-making, which have been in operation for two years and a half at the New York Trades School. To these have been added similar classes in plumbing, brick-laying, stone-cutting and plastering. Out of the whole number of pupils, which has much more than quadrupled in two years, the largest class is that of the plumbers, who are instructed and practised in dressing pipes, making joints, and fitting up all sorts of apparatus in the best and safest manner; while the theory of drainage and ventilation is taught by regular lectures. The next class in point of numbers is that in bricklaying, which is taught in the same way, by combining practice with theory. The pupils are instructed in the properties of limes, cements and mortars, and the changes involved in slaking and setting are explained to them, the intervals of study being devoted to building piers, arches, walls and chimneys, which are afterwards torn down, the bricks cleaned, and the mortar re-tempered for further use. The class of last year was employed in constructing the building, thirty-three feet wide and seventy feet long, in which the instruction is now given, and were paid regular wages for their work; but under ordinary circumstances the pupils pay a small tuition fee, which serves to meet the actual expense of instruction and wasted materials.

EVERY few months some one announces in the newspapers, with the air of an original discoverer, that the aggregation of many patients, whether suffering from mental or bodily diseases, in the ordinary large hospitals, is more or less injurious to all of them, tending, in lunatic asylums, to keep up the abnormal mental condition, and in ordinary hospitals subjecting the patients to greater risks from infection and foul air. It is due to the architectural profession, at least, to say that there are very few members of it who do not understand this, as well as a good many other points in the construction of hospitals; but it is also true that the cost of land, construction, and maintenance for the collections of detached cottages which form the best of all hospitals is so enormous, in proportion to the number of patients to be treated in them, that only in rare instances is the necessary expenditure possible, or at least justifiable in view of all the circumstances. To take a recent instance, the noble New York Hospital, built a few years ago in the very heart of the city, with every precaution that science could suggest, and at a cost of about a million of dollars, is five stories high, and, according to some inconsiderate persons, is for that reason defective, and unworthy of imitation. Large as the cost of the building was, however, the value of land in and about Fifteenth Street is so great that an area of sufficient dimensions for a group of cottages which would contain the average number of patients treated in the hospital could not have been secured there for many times the sum appropriated to the purpose, and the only alternative would have been to remove the hospital to the upper end of Manhattan Island, where land is cheap. But this, again, would involve the transportation of most of the patients from the crowded portions of the city to the suburbs, over miles of pavements, at the risk of fatigue which would inevitably be fatal to many of them; and the choice in this case, as in hundreds of others, being between a thoroughly airy and wholesome cottage-hospital at a distance from those who would need its aid, and one less perfect in these respects, but close at hand, there can be no question that the latter was, and is, the preferable alternative. With lunatic asylums the case is different, and except for the great expense of maintenance, the cluster of small detached houses is now usually considered to be the best arrangement. Few Boards of Lunacy are, however, willing to charge the public treasury with an annual outlay, for the care of the insane in such asylums, five or six times greater than would be necessary under the old system, and this plan makes its way slowly. The authorities of Kings' County, New York, which includes the great city of Brooklyn, have the honor of being perhaps the first in this country to adopt the cottage system for a lunatic hospital on a very large scale, and one is to be built for them which will, we

hope, prove so successful as to set an example which no public body hereafter can ignore. In the new Kings' County Asylum only three or four patients are to be allotted to each house, forming little families, under the care of their own attendants, and surrounded by the best possible influences. Experience in Europe has shown the superiority of such treatment over the usual method, and the trial of it here on so large a scale will prove very interesting.

THE local journals mention the fact that a number of the best architects of Indianapolis, at the suggestion of Mr. Wallingford, a Fellow of the American Institute of Architects, met recently to consider the matter of forming a Chapter of the Institute in that city. Several applications for membership in the Institute were immediately forwarded, and the prospect for the establishment of a most active and useful association seems very good. We can say with confidence that the Indianapolis Chapter, if it should be established, would be warmly welcomed in the Institute, representing, as it would, a portion of the country where much interesting and valuable work is done, under the direction of men whose reputation has already spread far enough, notwithstanding their isolation from the rest of the professional world, to make their brethren anxious for a better acquaintance with them; and in return, the new members will probably soon have occasion to learn, with satisfaction, the value of the moral support of a large and influential professional body in cases where isolated practitioners would be nearly helpless. The general body of the Institute, or its officers, where action by the Institute as a whole was impracticable, has always shown itself ready, when called upon, to define and support the rights of members, and its aid, valuable as it has been in the past, gains in authority with every accession to its ranks.

A SINGULAR story is told by the *Detroit Free Press*, which we give for what it is worth. According to its author, the proprietors of the *New York Herald*, on the occasion of the reduction in price of their journal, had the impudence, to call it by a mild name, to paint an announcement of the change in large white letters upon the walls of Fort Lafayette, in New York Harbor. On discovering the ignominious use which had been made of the fortress in their charge, the officers in command of the post sent a peremptory order to the *Herald* managers to remove the inscription without delay. It was necessary to obey, but the stone of which the wall was built being somewhat porous, it was found that the paint had penetrated to certain depth, so that scrubbing was quite insufficient to remove it, and it was necessary to cut away the whole with chisels.

MR. WILLIAM MORRIS, perhaps the most thoughtful artist of the time, has arrived, by a different way, at a position in relation to the present theories of political economy very similar to that which Mr. Ruskin has so long occupied. Believing, as he does, that appreciation of beauty, and artistic sentiment, are among the chief sources of happiness, Mr. Morris has devoted himself to the search for some method of developing these qualities in those who need them most, the poorest of the working people; but seems to have given up the inquiry in despair, concluding that art is impossible in the present condition of the world, and will not return until monopoly and industrial competition have been abolished. The latter obstacle to general felicity has already been denounced, as most readers will remember, by Mr. Ruskin, in some of his best works, but unlike Mr. Ruskin, who contents himself with the contemplation of things as they ought not to be in the abstract, the younger reformer has taken steps toward the realization of his theories by joining a socialistic organization known as the Democratic Federation, of which he has become one of the most prominent and active members. As a sincere and intelligent man, Mr. Morris is hardly likely to do any one much harm in his attempts to carry his ideas into effect, and it will be at least interesting to observe the movements of a professed socialist, who has intelligence enough to be able to give some account of his aims and methods, and honesty enough to make his statements of fact worthy of attention.

IT is quite common in building contracts in England to insert a clause providing that "all materials shall be the property of the party of the first part as soon as they are delivered on the ground," the party of the first part being the owner of

the land, and a further stipulation being sometimes added, reserving to the party of the second part the right to remove surplus materials at the completion of the building. The intention of this clause is, in case of the bankruptcy of the builder, to prevent his creditors, or the assignee for them, from laying claim to materials delivered for use in the structures which he had contracted to erect; and it has generally been held that such an agreement was valid for this purpose. A recent decision, or rather, the net result of two decisions, has confirmed this view in a particularly direct and definite manner. A certain proprietor at Tunbridge Wells made a contract, containing this clause, with a builder who afterwards went into bankruptcy. A creditor, having obtained judgment, laid claim to some bricks delivered upon the proprietor's land to be used in his buildings, and, on being confronted with the special agreement in the contract, answered that such an agreement constituted a bill of sale of the bricks, and not having been recorded as such, was void so far as he was concerned. The County Court judge held that the creditor was right, and that the agreement was, in effect, a bill of sale, but the Court of the Queen's Bench Division reversed this judgment, holding that such stipulations were not bills of sale at all, but something quite different. A second appeal is to be taken from the decision, and it may possibly be again reversed, but whatever the final result may be, this case, known as "*Reeves versus Barlow*," is likely to be the most important precedent of the kind.

IN a letter to the *Sanitary Engineer*, General Holabird, the Quartermaster General of the United States, relates very frankly some experiences of his in ventilating traps and drain-pipes at a military station in California. "Captivated," as he says, "with the notion of purifying pipes and traps by a circulation of air," the General took occasion to fit ventilation-pipes to several kitchen grease-traps, which had been built of brick just outside the house walls, and covered with plank and clay. The return of gas from these receptacles had been intercepted in the usual way, and no offense had been noticed from them. As soon as the ventilating-pipes were applied to them, a change took place. The decomposition of animal matters, which had seemed to go on quietly in them before, was apparently made much more energetic by the increased air supply; and the odors of putrescence exhaled so abundantly from the top of the ventilating pipes that the occupants of the houses, and even their neighbors, complained, until the attempt at ventilation was abandoned, and the pipes removed. Some other experiments which had similar results, ended by bringing conviction that venting trapped wastes, so as to prevent siphonage or back-pressure, was to be sought rather than the maintenance of an abundant circulation of air through the waste-pipes. In regard to the material for such pipes, it is worth noticing that the lead drain which carried the grease from the hospital sink was continually gnawed by rats, who made holes in it, often at inaccessible points, so that the whole was at last removed, and replaced with galvanized iron.

A GOOD illustration of the French practice in regard to responsibility for fires is given in the last number of *La Semaine des Constructeurs*. It seems that several families occupied the different floors of a certain building. The inhabitant of the first story built a fire in his kitchen range, which set fire to the soot in the flue above. The chimney grew so hot that a mirror, fixed to the wall over the flue in the apartment on the next story, was cracked in several places, but no further damage was done. The correspondent of *La Semaine* wishes to know who is responsible for the injury to the mirror, the proprietor of the building having apparently done his part toward keeping the chimney in good condition by having it swept a short time before the fire. In reply the editor of *La Semaine* quotes a law of 1883, which says that "If there are several tenants, all are responsible for the consequences of a fire, in proportion to the rent of the apartment which they occupy, unless they can prove that the fire began in the apartment of one of them, in which case that one is held, and the others are free; or unless any one can prove that the fire did not originate in his apartment, in which case he is relieved." Applying this law to the occurrence in question, the editor thinks it evident that the fire originated from the kitchen range of the first-floor tenant, and infers from this that the latter will find himself obliged to pay for the mirror.

SPANISH ARCHITECTURE.¹—VI.

GRANADA (continued).



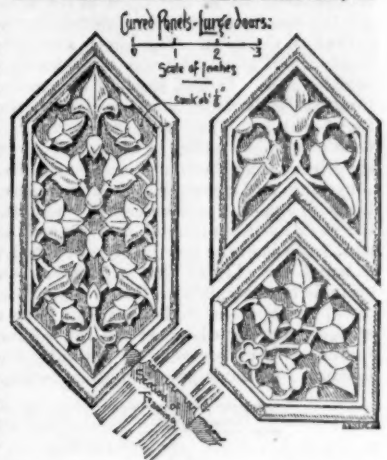
effect, the refinement of form, the glow of color, which pervaded one of these halls in its complete, habitable condition. Besides the ornamented walls, and ceilings, and marble floors, and fountains, which alone are so fascinating, there were doors and shutters in panelled and carved wood, lattices and screens elaborated with all the possibilities of lathe and chisel; pieces of furniture still more intricately decorated with inlays of pearl, and ivory, and metals; all these of wood. Then to continue the list, must be enumerated works of brass and silver; swinging lamps with cases and frames of filigree and pierced work, and chains of which each link was an artist's study; braziers for holding fire and burning odorous spices; stands and covers for vases, and a multitude of other articles of polished metals, all wrought into such delicate detail with hammering, and sawing, and chasing, that even a broken fragment of one is a beautiful object: then in some apartments, swords, and shields, and spears, and numberless arms of war and of the chase, all fitted by beautiful design to decorate a king's palace as appropriately as to defend his person in the field: next, resplendent objects of enamelled earthenware, great vases and tiny cups, many with mountings of precious metals: next, a profusion of articles of personal adornment, or for domestic luxury; jewels and precious crystals set in materials almost as valuable because of the labor bestowed upon them; and a wealth of color in woven fabrics, rugs, and cushions, and curtains, such as the dyes, and looms, and designs of all the world in all its ages cannot surpass, and rarely rival. Then stained-glass enriching the sunlight for the eye; the sweet smells of flowers and fruits, and of artificial perfumes for the nostrils, drifting in an atmosphere vibrating to the music of tinkling fountains, and of harmonized instruments delighting the ear, may help to complete a conception, which is far within the truth of the glories and luxuries of the palace.

It should be remembered that this catalogue of art-treasures is not imaginary except in its application; that is to say, fancy may be weaving ideal dreams and pictures in reinstating the scattered parts, and in her compositions she may be vague and poetical; but it is simple fact that the materials of the composition were such and similar marvels of art, for many of the objects exist yet; and it is plain history that these objects were gathered together in magnificent wealth within these walls, so that the imagination is only legitimately exercised to conceive what it can within these bounds. And I think that no other examples and recollections can produce in the world of art a whole more beautiful or artistic. Unity of style, and

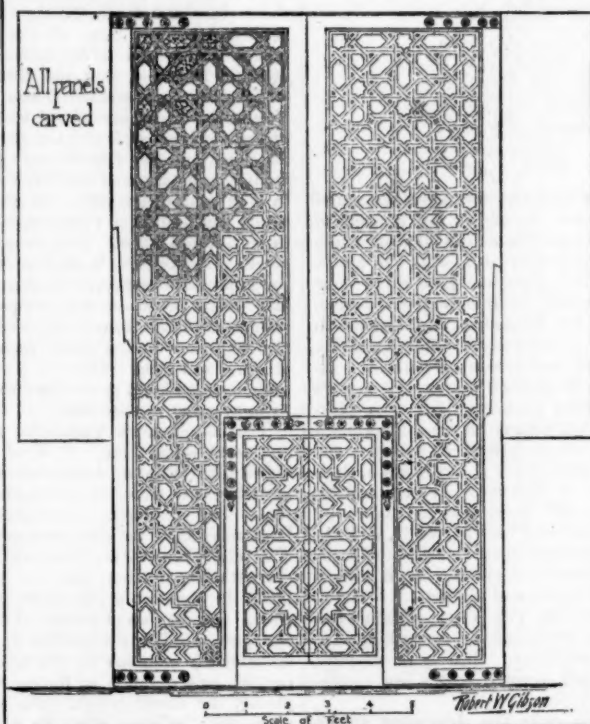
that style characterized by originality, elasticity and progressiveness, appropriate adaptability to numerous materials, and logical solution of utilitarian problems; all these qualities assist the refinement and intrinsic beauty of this Moorish work; from wall and roof to the smallest jewelled ornament. And there is one artistic principle which deserves special mention, that is, the extreme of grace and design carried into minutest details. Everything is covered with design. No broad surfaces "enriched" with vermiculations or meaningless spots and splashes or empty stripes, but always with intellectually conceived ornament which bears close inspection as Nature bears the microscope, revealing new beauties; and these, like Nature's, so subordinated that the greater design is undisturbed. This thoroughness which pervades all ornamented things is one of the best teachings for our age with its reckless use of unstudied elaborations.

It is indeed a pity that the Hispano-Moorish, the purest branch of Oriental design, should have been a trespasser in Western gardens, and so have been lopped off to perish full of its best blossoms. How little, after all remains, even of those things which properly come under the direction of the architect and decorator. Besides that part of the treasures which was accessory to the architectural magnificence, and which, being as beautiful elsewhere as here, was removed as salvage or spoils, a great deal that belonged strictly to the buildings has gone, especially what was constructed of wood. Time and the elements attack that material most effectively, and human despoilers found it readily separable and portable. So the doors and screens have in most instances vanished after the furnishings and gems. There is one great pair of doors, however, still hanging in their massy frames at the entrance of the "Hall of the Abencerrages" from the "Court of the Lions," which are prominent among the survivors, and these I carefully drew and measured. The ornamental interlacing lines with exquisitely carved leaf patterns in the panels between, are better described as inlaid than as panelled, as the latter word is understood in modern wood-work. The visible parts are not framed together to form a skeleton, but are pinned onto a solid, flat-framed door of wood, just as the tile dados are set upon the walls; another example of that disregard in the decoration for the true construction, which I have before noticed, and which is probably the greatest defect in the style as an architectural one. Yet, though Decoration be here divorced from her spouse, she is so beautiful in her independence that one hastens to pass the mention of it.

Alhambra: Doors to the Hall of the Abencerrages



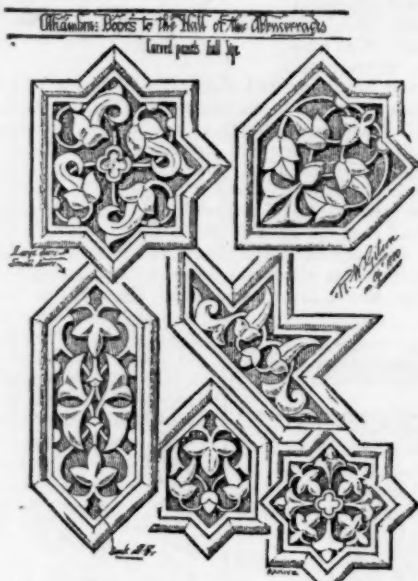
Alhambra: Doors to the Hall of the Abencerrages: Carved Wood



These doors are very good examples of the method of interlacing design, differing at the outset from both of the tile patterns lately given. The vertical and horizontal positions of the leading lines are retained to fit better into the limited rectangular outline of the door, and the radiating patterns developed by them are varied from the different centres so that not a repetition, but a harmonious change is given, where a less artistic instinct would have repeated the one design. The carved work, too, is so disposed in direction of growth and shape of leaves that it falls in with, and helps the geometric idea of the grouping. It is not a mere enrichment of surface to fill so much space, and for this reason it is varied only within a certain number of changes bringing symmetry into groups to enforce

¹ By Robert W. Gibson, Travelling Student of the Royal Academy. Continued from page 269, No. 415.

their unity. The doors are three inches thick, two inches of inner constructional work, with one-half inch on each side of decorative inlay. The outer stiles and rails are, however, of full thickness. The stiles are scarf-jointed, as shown on the drawing. The small doors though designed as one, open in the middle, and the meeting stiles are full thickness with the intersecting work let in, and the panels carved on the solid. The hinges and bolts with big ornamental nail-heads are of iron. All was undoubtedly painted, although no color remains now. Indeed much of the carved and moulded work is restoration lately done, but so well done that there is no fault to be found with it. That word "restoration" has been applied in Europe to so many modes of work, and so vastly different that it is not surprising that there are many and diversified opinions about it. Anything and everything, from complete rebuilding down to botching with stucco, has been called "restoration." Sometimes all the old work has been altered, and scraped, and varnished to match the new, sometimes the new has been rubbed with dirt and washed over to match the old; so that critics and antiquarians have had just grounds for complaint. But it is only fair to say, that often, most often, perhaps, restoration has been done with tender respect for the antique, copying whenever the relics gave a model to copy, and designing without pretence of antiquity when necessary. In the Alhambra, I do not suppose anything (except perhaps some color) has



been done without sure precedent. In fact, the work is rather one of repair than restoration, usually, an effort to arrest the inroads of time and weather rather than to obliterate the marks already made by them. It is entrusted to a resident conservator, who has under him a small staff of workmen (beside the guardians), to apply their labors where most required. They are only ordinarily good Spanish artisans, but from working always in the Alhambra they become so familiar with it, and the spirit of the style infuses itself so naturally into their work, that they are Moorish artisans to all purposes required of them. I have heard complaints that not enough money was devoted to this restoration, that more work, and that more thorough should be done. For my part, I am pleased to see just so much in hand as there is. If such restoration is desired as will prevent one's ability to say which is ancient, and which is restoration, then let that be done separately, let a copy of that court or this hall be devoted to experiments; but let the old venerable Alhambra be only protected and repaired. Its cracked and bending walls, and ancient and disintegrated stones and rain-roughened marbles and stuccoes, would look like the face of an enamelled old actress, if forced again into their youthful array of new paint and gilding.

Granada would be a deeply-interesting city even without the Alhambra, but this, its chief glory, so overshadows everything else that other attractive things are often neglected. Rightly or wrongly I took that common course myself, and devoted only a few grudgingly-given hours to the rest of the city.

The "Generalife" on a smaller hill near the Alhambra shows some Moorish and some Renaissance work, and is well worthy description and sketches, but I had not time. Then what picturesque "bits" of color, and light, and shade are to be found in the gypsies' village. It seems scarcely credible, yet it is bare truth that here, forming part of a European city, is a village of caves,—the queerest, dirtiest, most savage homes in Spain, excavated side by side into the steep face of the rocky hill, burrowed back deeper or shallower according to the diligence or necessities of the inhabitants, who have made their homes about as well as rabbits or rats do. They seem to be secure enough, and usually dry enough, and perhaps are better houses than the same indolent, uncultivated creatures would build on the surface of the earth; yet the first impression caused by them is blank surprise that they are there, forming a suburb of a civilized city.

Granada contains also fair "*paseos*," public promenades shaded by tall elms, and in them as in most Spanish cities those of the population who have leisure (and they are many) love to see and be seen in their best attire at the close of day. Everywhere the *paseos* are good places for the inquisitive traveller to observe the natives, and their local costumes and manners, although it must be confessed these are fast disappearing in cities which see so many strangers as Granada does. The majority of the men continue to wear the national "*capa*," but it is a tailorized garment less artistic and no more useful than the older things one may find farther north; and the women dress after French styles,—quite a little way after them it is true; there is still something essentially Spanish in their fashions; bonnets and hats are very rare; the black lace head-dress holds its own yet, and mantillas, too, are cut and worn without quite forgetting the old traditions. But after all there is not very much in the attire of these well-to-do citizens that will interest the artist as will the nondescript, threadbare, patched and darned habiliments of gypsies and beggars.

The main street of Granada was, when I was there, changing its aspect much as the inhabitants were. It is named "*Calle del Darro*," and the Darro, a rapid mountain stream, runs tumbling and swirling over its bed, down the centre, between rough and irregular retaining-walls and rocks, and is crossed here and there by ancient stone bridges. The buildings are in many instances picturesque and old, so the Calle del Darro is a thoroughfare not to be traversed hurriedly the first time one sees it; many a halt to look a moment at the quaint scenes, and sometimes a stumble recalling the eyes from irregular distances to nearly as irregular footways. Probably by this time I should write that all this was instead of is, for when I saw it masons were busy covering in the stream, and making a wide modern roadway over the arch, which will soon conceal a sewer. However, the Darro's bed was already defiled and unpleasant to look into, except when lately swept by freshets; and sanitary improvements do come at last, even in Spain.

The "*Zacatin*," whose name of Moorish derivation proclaims its origin and purpose (viz., street of the market), is another thoroughfare which well repays leisurely inspection. Somewhere in this neighborhood I came into a long alley, some twelve feet or so in width, a regular Moorish bazaar, a trifle too regular, perhaps, but very interesting. Horse-shoe arches upon marble columns and capitals extend along the two sides, fifteen arches on either hand, and two other branch alleys each twenty or twenty-five arches in length, open from the first. I measured and sketched some parts, and from those drawings made the sketches which head this and the two preceding chapters. Some of the detail in stucco is identical with and evidently copied from decorations in the Alhambra, and it all looked newer. I learned that the Bazaar had been burned down in 1830 and rebuilt, so doubtless it was then that the borrowing occurred. The little shops are closed with wooden doors or shutters, and the upper windows with wooden gratings and lattices. Some have glass windows, but the favorite way (at least in summer) is to open the front completely, and sell the wares from the outside, just as they do in Fez and in Bagdad. There is a much prettier effect, architecturally considered, in these arches when they stand thus unhampered by sashes and glass. The latter, especially, however transparent or however ornamental it may be, seems to me to injure very materially the expressive beauty of an arch even more than that of a colonnade; and fronts of stores and shops having pillars and girders without sashes are often seen in Spanish streets, looking very inviting, too, although they do not make such display as our northern showcases of glass and iron. There is a reality, an honesty of purpose about such fronts which, more than their novelty, I am convinced, makes them pleasant to look into.

The Renaissance Cathedral at Granada did not stimulate me to any great admiration. It is of considerable size, and has a certain dignity, but like so many others of its order it misses entirely that varied beauty which in spontaneous styles holds and leads the attention. The scholastic repetitions of pillars and arches in well-regulated rows show nothing new, nothing which is essentially their own. The whole is a worthy composition, but its parts are lifeless and unsympathetic, and so a glance is sufficient. There is no pleasure or profit in contemplating mouldings and capitals the exact like of which can be found in any of those text-books which surfeited the eye and mind in the earliest days of architectural study. Or if, as occasionally happens in this so-called Græco-Roman style, a carved capital, or a manner of fluting upon one column does attract and please, the small delight ends just there, the next capital is the same, and the next also; no refreshing little evidences of human minds and hands having worked and thought over them, pondering with loving care their purposes, and the means of expressing them—only a mechanical, pedantic rule, intellectually invented, but worn threadbare in unintellectual reproduction. This is why I cannot feel any enthusiasm in this type of the Renaissance.

I visited the Cartuja convent a little outside the city, a place of which I had heard such laudatory descriptions that my expectations ran high, but which proved to be the usual conventual medley of bad pictures and worse architecture. There is some very fine polished marble and agate, beautiful materials, but tortured into such hideous Rococo forms that it is a pity the workmen were possessed of their adroitness with the chisel to debase art so dexterously.

Notwithstanding such disappointments every ramble in this ancient city is a happy experience, for there are good things in plenty

beyond the few I have hinted at, and in such variety that doubtless every observer would select a different list for especial mention.

THE FIFTY-FOURTH ANNUAL EXHIBITION AT THE PENNSYLVANIA ACADEMY.

THE RESURRECTION. ALTO RELIEVO BY A. LAWSON.



TO say that the present exhibition at the Academy is better than any of its fifty-three predecessors would be the safest and most moderate kind of a statement. The only display that ever deserved to be compared with it was the one held in the Academy's galleries by the Philadelphia Society of Artists three years ago, which was, in fact, a co-operative affair undertaken by the Society and the Academy's officials working together; the former soliciting the work of artists in this country, and the latter bringing over anything which American residents in Europe wished to exhibit.

It was the first time that any institution had made a really serious effort to secure a representative exhibit from this class of workers, and the exhibition was memorable for the success which attended this effort; but the Academy has adhered ever since to the policy, which was adopted then, of authorizing the appointment by the artists themselves of European committees which should act for the Academy in accepting works offered for exhibition; all contributions accepted by such committees to be brought over at the expense of the Academy. The division which took place between the Academy and the Society about that time, and which resulted in the establishment of separate exhibitions by the artists in a gallery of their own, has undoubtedly deprived the Academy, for the last two or three years, of a good many things by the home painters which would have added much interest to its exhibitions, but the foreign contingent has, of course, been undisturbed; and the Academy has conferred distinction on its collections, and earned a great deal of credit by the course it has pursued.

One drawback, however, to the complete success of its exhibitions has been found in the custom of holding the principal exhibition of the year in the spring. This was inconvenient for the artists on the other side, who, of course, wanted the benefit of the *Salon* before sending their pictures to America, and so they were shown at a "special" exhibition, which the Academy has been accustomed to arrange in the fall, and which has by this means been made more interesting than the more regular, but often quite meagre, annual display which came in the spring. The difficulty has been obviated now by holding the annual exhibition in the fall, and as the members of the Society have grown decidedly better natured within the last year or two, and have not only contributed themselves, but allowed their friends to do so, the present exhibition is a very full and fair showing of what Americans can do in art.

The "feature" of the present exhibition, if we may be allowed to borrow a phrase from our friends in Wall Street, is the competition for prizes, of which there are several this year. Mr. Temple's offer of three thousand dollars for the best historical painting on a subject relating to the American Revolutionary period was the most important prize, and the interest is, of course, the greatest in this competition.

As far as eliciting the services of any of those artists whose co-operation was most to be desired is concerned, the result in this case is precisely what it has been in almost any one of the many competitions which recent years have witnessed, and the temptation to fall back on the critical "I told you so" is very great. But is there not something else that is worth saying, too?

The three thousand dollars would have been very well as a prize, or even as two prizes, but it was certainly too much to expect that it should also buy the picture. There can be little doubt that had it not been for the insertion of this unfortunate clause, and the stipulation that no member of the jury which was to decide on the merits of the pictures should be an artist, two or three of the half-dozen Americans who are competent to treat such a theme might really have been encouraged to do so.

As it was, four pictures were painted; three by young men in Philadelphia, and the other by Miss Sarah Dodson, a Philadelphian artist, but who is at present living in Paris.

Miss Dodson's picture is the largest and most ambitious. The subject is "The Signing of the Declaration of Independence." Mr. H. T. Cariss has painted "The Oath of Allegiance at Valley Forge," and Mr. W. T. Trego, who received the "Charles Toppan prize" of two hundred dollars for his picture of "A Battery of Light Artillery en Route," a year ago, is represented by the "The March to Valley Forge." Mr. Frank F. English, who has done some pretty good work as a marine painter, contributes "The Action off Flamborough Head between the *Serapis* and the *Bon Homme Richard*."

It can hardly be worth while to criticise the pictures in detail, or to discuss at any length the grounds on which the jury has made its award, but some little description of them may be of interest. Four prizes were offered. The first prize was three thousand dollars, which was also to buy the picture. The second, third and fourth were to be medals of gold, silver and bronze, respectively. The committee has decided not to award the money prize, nor the gold medal, nor the bronze medal; the silver medal is given, "Most lame and impotent conclusion!" to Mr. Trego, for the picture which is certainly about the worst of the lot, so far as any positive good qualities are concerned. Its merit is that its faults are rather less positive, too, than is the case with the other contributions. The composition is simple, but, on the whole, effective enough. Washington and an officer or two sit on their horses in a thick snow-storm beside a most forlorn-looking road, which runs straight across the picture, and along which the wretchedest of armies is marching. There is no attempt at color, and there is certainly nothing very clever or attractive about the execution, which is, throughout, of that melancholy and commonplace kind which Mr. Eakins has succeeded in making his students believe to be the proper thing in painting. There is good feeling in it, however, and it would be quite an interesting work if it were not for certain faults of drawing which are so obvious as to be quite unpardonable, and if the snow-storm were not such a very elementary affair, being, in fact, little more than a multitude of dabs of white paint distributed like spatter-work over the picture. These faults are the more surprising because the picture which won the prize last year was really a very good one indeed.

Mr. Cariss's is much more exacting as a composition, and in spite of some faults of execution which it is easy enough to point out, it is the more important work. The room has been well studied, and all the inanimate part of the picture is vigorously and freshly painted. The composition is very good, except that there is rather too much action in the principal groups, so that the picture lacks repose. The heads were evidently done in a hurry, and are the weakest part of the work. If these could be repainted, and something of the over-exertion of two or three of the most conspicuous figures restrained a little—such as that of the Baron de Kalb, for instance, who is waving a sword with his left hand while he rests his right on the Bible—the picture would really be a substantial addition to American historical painting, which could hardly be said of any of the others. The subject is certainly important and interesting. Mr. Cariss has represented Washington as standing and reading the oath which had been prescribed by Congress, and which he had taken himself before Lord Stirling. The four major-generals, to whom he is administering it, Stirling, Wayne, Steuben and De Kalb, are grouped about a table in the centre of the room; Hamilton is writing at a desk. Other portraits are those of aides-de-camp Tilghman and Laurens.

Miss Dodson's picture is very animated in composition, and shows a good deal of cleverness in the execution of many of the details, but it is rather loosely put together, and the canvas is too large for the figures, which are, besides, so brilliantly attired and so demonstratively vivacious in their movements as to suggest some meeting at the liveliest of French courts rather than the serious and perhaps sombre affair which we have been accustomed to think the Signing of the Declaration must have been.

Of the "Charles Toppan prizes" for the students of the Academy the first, of two hundred dollars, was not awarded, owing, it would seem, to the neglect of several of the students to state explicitly in sending in their works that they were entered for the competition, a piece of formality which the circular required, and which was doubtless inserted with good enough intentions on the part of those who prepared it, but which a disinterested outsider can hardly see any necessity for. Its insertion was unfortunate any way, for there are several very good things exhibited by students otherwise eligible, and it is a pity that somebody could not have got the prize.

The second prize has been awarded to Gabrielle D. Clements for a

very indifferent picture, "Boys Picking Berries," in which there is very little interest in either the landscape or the figures.

The "Mary Smith prize" of one hundred dollars for the best picture by a resident lady artist of Philadelphia goes a second time, and very deservedly, to Miss Emily Sartain, for her admirable "Portrait Study," a lady's head against a light-blue ground.

Although I have not given a very glowing account of the competitions for prizes I should be sorry to have it understood, therefore, that the exhibition as a whole was anything but a conspicuous success. I have already said that it is the best exhibition that the Academy has ever held, and it is.

It would be out of the question to even mention many of the works of conspicuous excellence which have been brought together here, but I cannot refrain from noticing, however imperfectly, the work of Mr. Alexander Harrison, whose half-dozen contributions from Paris are easily the most noticeable thing the exhibition has to show; this is not such a small thing to say as it might be, either, for Bridgman's "Planting Rape in Normandy" is here, and so is some of the best work that Charles Sprague Pearce has yet exhibited.

These things of Mr. Harrison's are afflicted with that sort of dusty paleness which seems to be regarded as quite the thing just now by a good many Americans who are working in Europe, and which is due to an influence for which M. Cazin is said to be mainly responsible. Whoever is responsible for it, it is an influence which is very marked at present and one which is very strikingly, and on the whole unpleasantly, apparent in any exhibition of contemporary work by artists residing abroad. It must be owned, however, that the influence is rather in the direction of refinement and spirituality than otherwise, and so is much less unwelcome than the grosser spell which some other painters whom one could name — Gérôme, say, or Cabanel — are wont to exercise over almost every young artist of promise at some period of his development. Mr. Harrison, a Philadelphian by birth, and a brother of Mr. Birge Harrison, whose picture, "November," was bought by the Government at the *Salon* of 1882, began to attract the attention of judges of good work about three years ago by some remarkably crisp and fresh marines, as different as possible from the delicate and dreamy things which he sends this year. His masterpiece, so far, is the "Castles in Spain," exhibited here a year ago, and noticed in the *American Architect* at that time. Its success is not to be attributed so much to the fact that it was the first of the delicate and dreamy ones as to the felicity with which the treatment was adapted to the subject. In the pictures which are shown this year the painting is quite as good as in the other work, perhaps rather better, but the choice of subject is less happy, and the treatment less sympathetic. Still it is only with himself that Mr. Harrison is to be compared, and either of the two large pictures which he exhibits here would easily have gained him a prominent place in any display of contemporary American work. The largest of the two is called "Amateurs," and contains two figures, a boy and a girl, who are fishing from a boat in a small lily pond. The charm of the picture is in the lighting of it. It is the soft brilliance of afternoon, so soft that there is literally no shadow anywhere, and yet so bright that the whole scene fairly swims in light. It has already been purchased by the Art Institute of Chicago.

The other picture is not quite so large, but is perhaps fully as important a work. It is entitled "A Slave." Its single figure is that of a boy, the size of life, who is leaning against a wall in an agony of restraint while he waits to sell a few miserable little fishes which lie on the ground beside him. He fidgets with his feet at a battered hoop which he holds between them, and tugs aimlessly at a string with which it is wound, and one end of which he holds in his mouth. He has slipped off the *sabot* from one coarsely stockinged boot, and he clings lazily with one hand to a ring in the wall above his head. The wall is scrawled over with the hideous figures which the boyish mind takes such fiendish delight in delineating, and having exhausted the possibilities of his restricted sphere in the way of diversion, he gazes into vacancy with that longing look, the wretchedness of which cannot be matched by anything outside the class of lazy vagabonds to which, at his age, all boys belong. The pathos of it all is admirable, but it is comical too; and the pity is tempered with amusement as it usually is in the work of the masters.

Other noticeable works from Paris are Henry Mosler's "A Rainy Day," two children under a red umbrella, very quaint and pretty; Miss Emma Chadwick's "Fishermen's Chowder," a fresh and strong bit of coast scenery, with a group of fishermen cooking their dinner in the foreground; a delightful "Fantaisie," by Charles Sprague Pearce, by all odds the most brilliant piece of painting, so far as technique is concerned, in the whole display; a very charming picture by Henry Bacon, of a dairy-maid walking beside a field of young grain, and called "In Normandy;" the strongest and best of the half-marines which Mr. Frank Boggs has lately been painting so well, entitled "Boats going out with the Tide, Isigny;" several very good landscapes by G. Roger Donoho, Clifford P. Grayson, George W. Chambers, — a new man I think, — who sends a very good large picture called "The Shepherdess;" Robt. H. Monks and Kenyon Cox; and some very pretty pictures of children by Miss Ellen K. Baker.

Of Bridgman's "Rape Planting," it would be an impertinence to speak, so much has been said about it already; but I must speak a word or two for a couple of pictures by young men from Boston, which have attracted the most favorable notice here from all those whose notice is worth most. One is a landscape called "The End of the Village," by Chas. H. Davis, quite as delicate and re-

fined, and as strong, too, in its way as any of the work by Mr. Harrison to which I have already alluded, and showing, I fancy, traces of the same influence which is so marked in the case of the latter painter. Only that it is very certain that in the case of Mr. Davis it is not a question of anybody's influence to any great extent, for he has been doing work of the same exquisite kind ever since he went abroad three years ago, and even before; ever since, in fact, he began to work in the first class that was organized at the Museum of Fine Arts, in Boston, in the winter of 1876 and '77, the gentlest, most sensitive, and most talented fellow among us.

The other is a portrait, a nearly full-length by Robert W. Vonnoh, "A Portrait of Mr. C." It is a little unfortunate in the pose, and in the air of the studio which clings to it. The sitter had much better have been seated in his chair than astride of it, and the cigarette should have been thrown away at the door; besides, this kind of Bohemianism in the treatment invites a comparison with Chase's "Portrait of Duveneck," which everybody is familiar with, and it would have to be a wonderfully strong picture that would not suffer by such a comparison. Apart from this, the picture is a great success, and is really the most striking portrait in the exhibition; although Vinton's "William Warren" is not far off, and makes a capital impression, too. The most striking, I say, not the most beautiful, Mrs. Whitman's portrait of a little girl is that. L. W. MILLER.

SANITARY PLUMBING.¹—XIII.

TRAPS.—GENERAL CONSIDERATIONS.



Old "Duck" or D-trap.

A TRAP is a barrier placed in the drain to shut out noxious gases. The barrier consists either of a simple body of water held in a bend of the pipe, or of a combination of a body of water and some form of mechanical closure, such as a valve, gate, or ball. A mechanical closure alone has been found insufficient to form a reliable seal. Consequently a loss of the water-seal destroys the efficiency of the trap.

Under the supposition that all traps are liable to lose their water-seal through siphonage, momentum and back-pressure, or allow of the transmission of gas-bubbles under back-pressure, unless protected by special ventilation, laws have lately been passed in many cities requiring a separate vent-pipe to be carried from the outgo of every trap into a special ventilation-duct, which shall be independent of the soil-pipe ventilator as far up as to a point above its connection with the highest fixture.

This provision in the otherwise wise and salutary plumbing-laws which have been enacted within the last year is an unfortunate one, and leads to unnecessary expense, great inconvenience, and serious danger, and will undoubtedly be repealed at an early date. At the time when it was framed, no simple and reliable self-cleansing water-trap was known, which could resist the severest tests of siphonage, momentum and back-pressure which could be applied to it. Had such a trap been known, the law would obviously never have been made. It is now believed that such a trap has been invented, and if the fact can be demonstrated, the burden entailed by this provision will no longer be endured.

The common round or "pot"-trap, though not self-cleansing, can nevertheless be made large enough to be practically proof against siphonage, and it may be periodically cleaned by hand if it is found to clog with sediment; but no trap, and least of all the S-trap, can resist the destructive effect on its seal of the rapid evaporation induced by the ventilating current required by the law. The seal is destroyed by evaporation in a very short time, varying with the rapidity and dryness of the current and the volume of water in the trap. The writer has found by repeated tests with a strong ventilating current that an ordinary one-and-one-half inch S-trap, with a two-inch dip, invariably lost its entire seal of two inches, in from four to ten days by evaporation from the outlet side alone, the house or fixture side of the trap being closed. These serious and unexpected results led to a series of careful experiments on the evaporation of the water-seal of traps, made by order of the Boston City Board of Health, the result of which will be described in detail hereafter.

Corrosion of branch pipes of moderate length by sewer-gas is never to be feared with ventilated soil-pipes. It is believed that there is no authenticated case on record of such corrosion, and no one advocates trap ventilation on this account. Indeed the induction through the branch pipes of soil-pipe air might not always be an advantage even in this direction. When the main soil-pipe is properly ventilated, the diffusion of gases, the absorptive power of water for gases, and the frequent water-flow through branch pipes afford them sufficient protection when the pipes are in use. When the pipes are not in use the waste matters adhering to their inner surfaces dry up, and it is believed that what decomposition then takes place goes on so slowly that its corrosive effect on the pipe is practically inappreciable.

It will be found that the ventilation of traps as required by the law adds dangers much greater than that which it pretends to remove. Besides the constant draught on the water-seal by evaporation, the vent-pipe increases the unscoured area of the trap, and, if any portion of a trap not directly scoured by water passing through it is liable to collect sediment, and ultimately clog up, then the mouth of the vent-pipe is also subject to this danger. It thus, in a measure, defeats one

¹ Continued from page 280, No. 416.



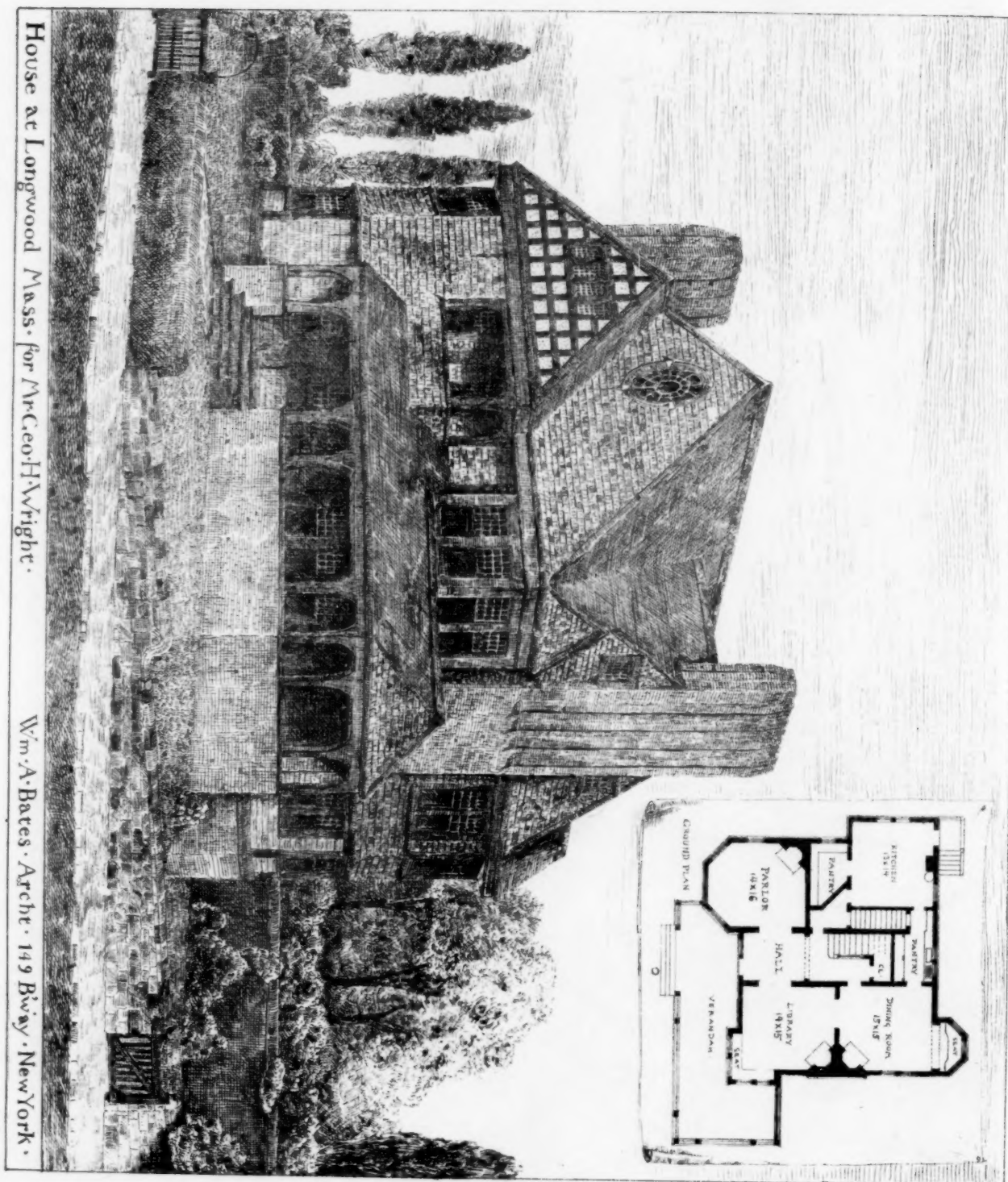
Henry P Kirby
Architect and Del. Allegheny Pa

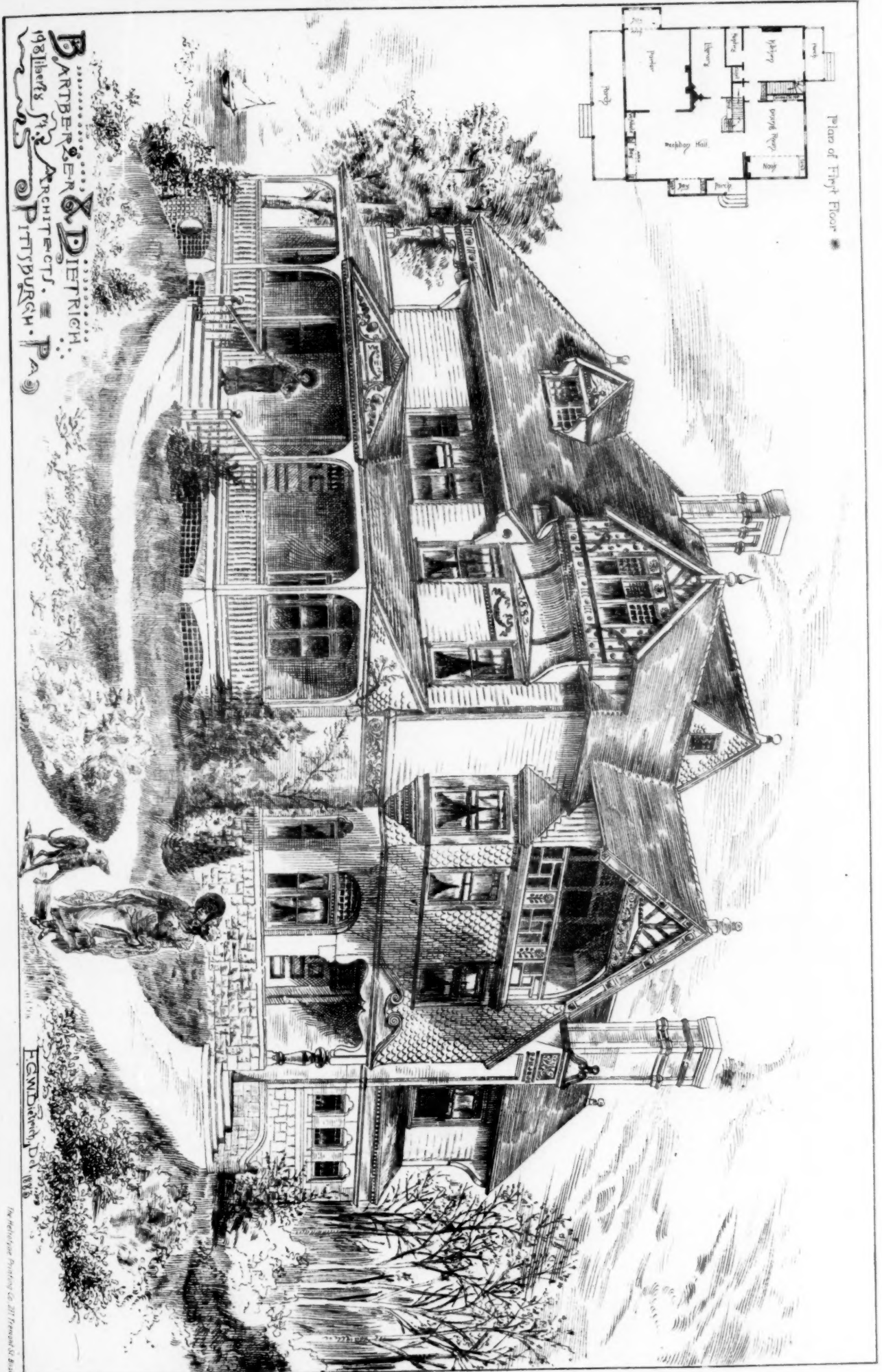
A Sketch for
a STABLE and
COACHMAN'S
ROOMS

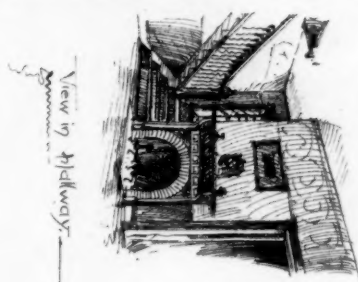
House at Longwood Mass. for Mr. Geo. H. Wright.

Wm. A. Bates. Architect. 149 Broadway, New York.

The Architectural Record, Vol. 1, No. 1, p. 10.

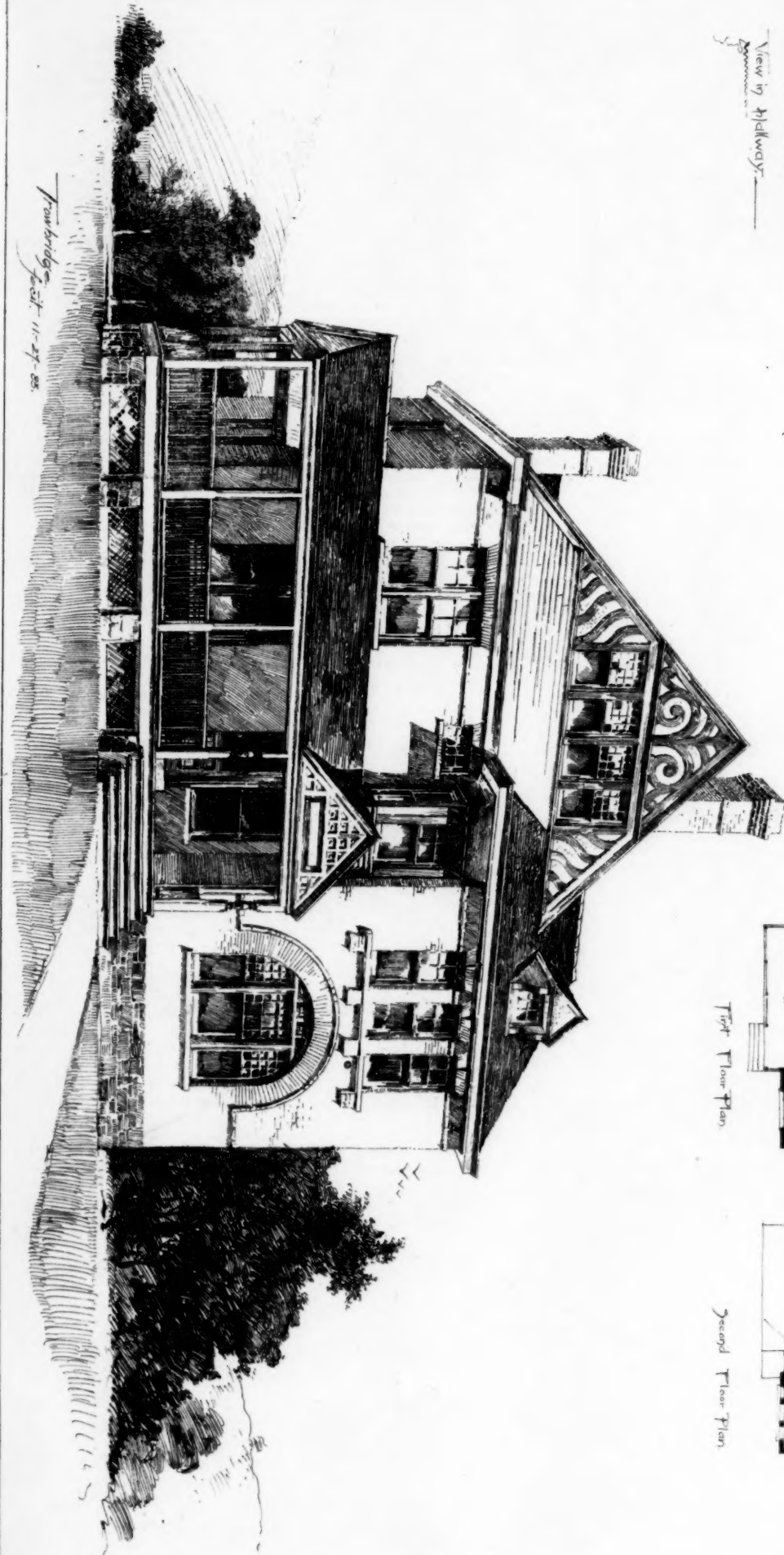






View in Hallway

House for Mr. Walter Zim
at Delhi, O.
Mr. T. Anderson, Archt.
Cincinnati, O.



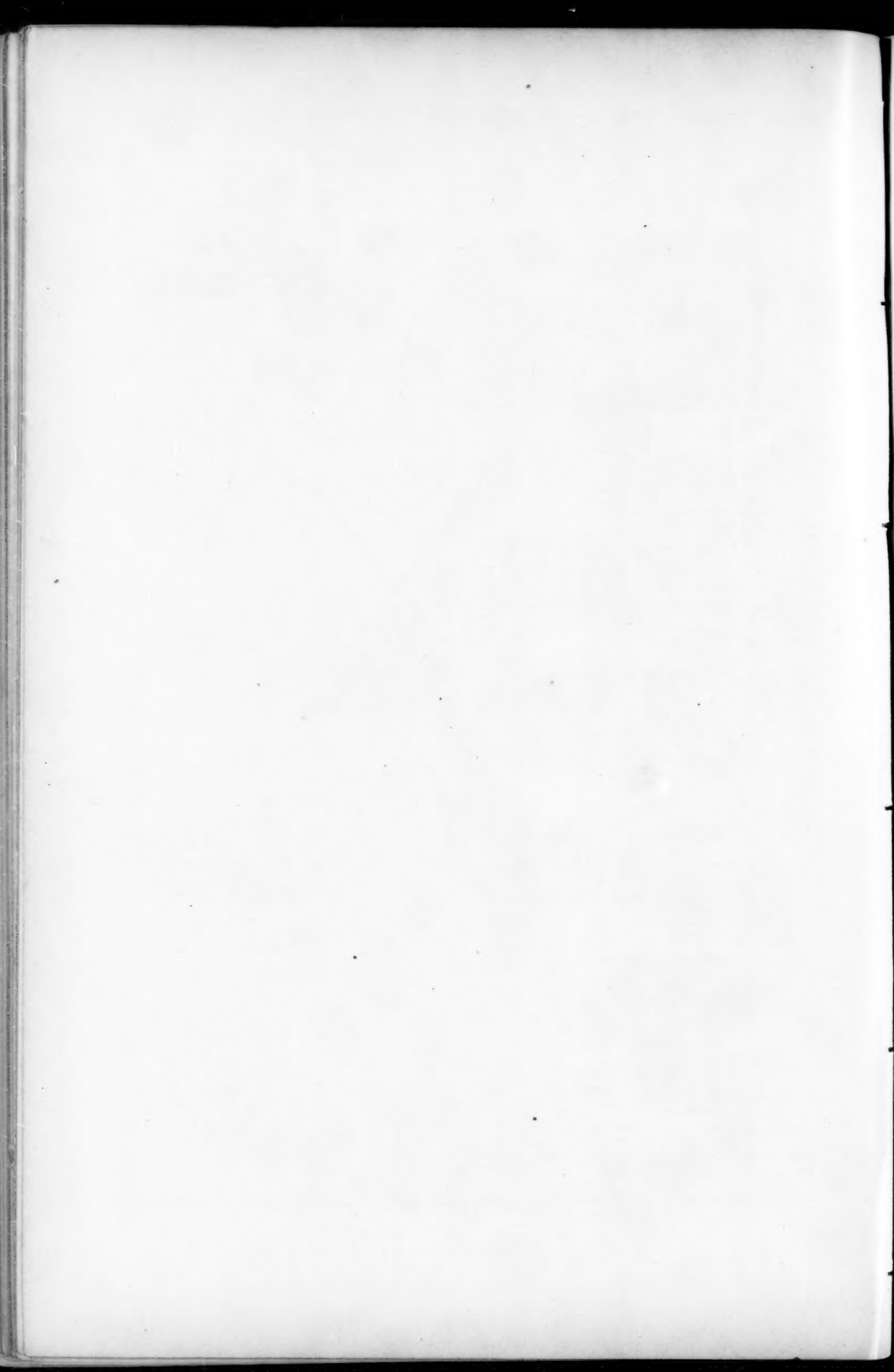
Franklin, Oct. 11-27-83.



First Floor Plan



Second Floor Plan



of its own objects; i. e., to provide a safe trap which shall be self-cleansing, and contain no chamber or corner which shall not receive the full scour of the water passing through the trap. Now the ventilating openings of traps have already been found, short as has been our experience with them, in cases completely closed by sediment, showing that this precaution is no certain protection against siphonage and momentum.

Add to these considerations the very important fact that the system of trap ventilation greatly complicates the plumbing and adds very largely to the number of joints required to be made tight, and very seriously to the cost of the work, and it will be understood why some of our ablest and most thoughtful sanitary engineers have so strongly condemned this law.

Short-sighted plumbers, dealers in plumbers' goods, and all those who are interested in them, or in the lead pipe in which they deal, may believe they see an advantage to themselves in the increased consumption of material and labor the law involves; and these men have ridiculed the more enlightened and disinterested opponents of the law, who have dared to put their "foot down on the vent-hole of a trap," and thus far they have been successful in keeping the law in existence; often, perhaps, in a sort of negative way by not making an honest opposition to it in accordance with their real convictions.

Traps are left in disuse and subject to the danger of loss of seal by evaporation much oftener than is generally supposed. Thus they are unused in city houses which are left unoccupied during summer; in country houses which are unoccupied during winter; in hotels and apartment-houses during the quiet seasons, or at times when they are only partly filled; in private houses in the spare chambers reserved for visitors; in business offices between the expiration and renewal of their leases; in school-houses, and all public and private office-buildings at times of vacation; in houses or chambers closed on account of the absence of their owners for travel, sickness, death or any other cause; in cases of draught, or "cut-off" of water-supply for repair of pipes, rebuilding, or other cause; in extra fixtures in houses, and in other places, and at other times which will upon reflection occur to the reader.

In a few days after a trap has thus been abandoned to the influence of the ventilating current, its seal will be destroyed by evaporation. Sewer-gas, laden with the germs more or less dangerous to human life which invariably accompany it, will escape freely into the house, impregnate the carpets, hangings, furniture, walls, and all porous substances entering into its construction, and then be ready to attack the unconscious owner upon his return.

CLASSIFICATION OF REQUIREMENTS.

The ideal trap should possess the following characteristics:—

1. It should do its work by means of a *water-seal alone*.
2. It should be *self-scouring*.
3. It should be capable of resisting the severest tests of *siphonage, momentum and back-pressure* that can ever possibly be brought to bear upon it in plumbing, and this without the aid of special ventilation.
4. It should contain a body of water large enough to be practically proof against *evaporation*.
5. It should be *simple*.
6. It should be *economical* to manufacture.
7. It should be made of *durable material*.
8. It should be so constructed that its *interior can be inspected* without removing the trap, or any part of it.
9. It should have a *tight-fitting clean-out cap*, arranged to be removed with perfect ease, and to admit of removing any foreign substance that may have lodged in any part of it.
10. All parts of its clean-out cap should be *under water*, to ensure detection of leakage if any occurred.
11. It should be so formed as to offer the *minimum of resistance* to the flow of water through it.
12. It should be independent of the fixture to which it is attached, and should be *easily connected or disconnected*.

At first thought it would seem as if some of the above requirements were incompatible or even positively antagonistic. How can a trap which is perfectly self-scouring and simple be made to resist the most powerful action of siphonage, momentum or back-pressure without the aid of some mechanical seal? It is nevertheless possible to obtain this result, and the manner in which it is done will be shown hereafter.

THE ILLUSTRATIONS.

HOUSE FOR WALTER ZINN, ESQ., DELHI, O. MR. E. ANDERSON, ARCHITECT, CINCINNATI, O.

HOUSE FOR GEORGE WRIGHT, ESQ., LONGWOOD, MASS. MR. W. A. BATES, ARCHITECT, NEW YORK, N. Y.

HOUSE NEAR PITTSBURGH, PA. MESSRS. BARTBERGER & DIETRICH, ARCHITECTS, PITTSBURGH, PA.

THE first story of this house is to be of local sandstone and brick, with terra-cotta finish, all laid in red mortar. The second story is to be of wood.

SKETCH FOR STABLE AND COACHMAN'S ROOMS. MR. H. P. KIRBY, ARCHITECT, ALLEGHENY, PA.

LECTURES ON ARCHITECTURE.¹—VIII.

SKETCH OF THE HISTORY OF ST. PETER'S AT ROME.

MONUMENT TO KING VICTOR EMANUEL
ST. UDINE
ITALY



THE ancient church of St. Peter had become so ruinous and dilapidated that Pope Nicholas V, a man who delighted in projecting magnificent undertakings, a lover of architecture, and one of more than ordinary genius, had conceived the project of rebuilding it, and, under the designs of Bernardo Rosellini, had actually seen a portion of the new structure rise from the ground before his death. The project seemed then to be forgotten and abandoned, until Michael Angelo, seeking a place for the erection of the mausoleum of Julius II, upon which he was then

engaged, thought that the area of Rosellini's projected new church would be well suited for its reception. He accordingly proposed it to the pontiff, who was pleased with the suggestion, and sent immediately for San-Gallo and Bramante to examine into it. In these cases it has been observed that one project generally suggests another; and the rearing of a new St. Peter's accordingly became a fixed object in the mind of Julius II. He consulted with several architects upon the subject; but the fact is that the only real competition lay between San-Gallo and Bramante. The latter was the successful artist, and from a great number of designs the Pope at last chose that upon which St. Peter's was afterwards commenced; but the real design of Bramante can scarcely be traced in the present church. The changes which it was doomed to undergo before its completion were greater perhaps, than any other building of its importance was ever subjected to. When Bramante died, his designs, if indeed he left any in existence, were dispersed and lost; and we are indebted for whatever knowledge of them has come down to our time, to the diligence of Raphael, the painter, who took much pains in collecting Bramante's ideas, and preparing them as they afterwards appeared in Serlio's "*Treatise on Architecture*." From these it is inferred that the original plan was simple, grand, and harmonious in its parts, and would doubtless, as a whole, have been far more effective than the edifice as executed by subsequent architects. It was crowned with a cupola, more like that of the Pantheon than that of St. Mary's, at Florence; so that the idea of the dome, which is currently believed to have originated with Michael Angelo, emanated in fact from Bramante, though the honor of carrying such a project into successful execution belongs to the former artist. It is not, however, probable that if Bramante had lived, he could have strictly executed the design which he produced. It has been clearly proved that the piers in the interior, which support the dome, would not have been sufficiently substantial for the weight to be placed on them. Bramante's cupola would have been much heavier than that executed by Michael Angelo, and it is on record that that architect considered it necessary to make his piers three times as thick as the former had ever proposed.

The general design having been adopted by Julius II, the structure was immediately commenced with a vigor and promptitude of which few but such men as Julius and Bramante were capable. One half of the ancient basilica was taken down, and on the 18th of April, in the year 1506, the first stone of the new fabric was laid by the Pope, under one of the large piers of the dome commonly called that of St. Veronica. The four piers soon rose, and the centres or scaffolding were prepared for connecting them by arches, which were actually constructed; but the weight and thrust of such massive vaults bent the piers out of the perpendicular, and cracks and fissures made their appearance in every direction. Thus, even without anything more than their own weight to support, much less that of the great cupola which was to have rested upon them, the works of Bramante threatened to fall to ruin. The great haste with which they had been raised had, without doubt, much contributed to this catastrophe. Bramante dying in the meantime, Raphael, Giocondo, and San-Gallo, and subsequently Baldassare Peruzzi were engaged on the edifice, and severally used the proper means for remedying the defects that had arisen, and for fortifying the great piers of the dome. To assist in this, as well as to push forward its proper completion, the great Michael Angelo was at length employed; and the rest of his life was chiefly devoted to carrying on the works of the huge fabric under his personal direction, and from his own original designs.

The history of the building of this church presents us with a singular instance of mismanagement. From the death of Bramante, which occurred in the year 1513, down to the year 1546, when Antonio

¹ Extracts from a lecture by the late Mr. Arthur Gilman, delivered before the Lowell Institute, Boston, in the winter of 1844-45. Continued from page 246, No. 413.

San-Gallo died, all of the architects I have before named had been more or less extensively employed upon it; it was during this period that Bramante's original plan was so much deviated from by Peruzzi. The works are said to have become at this time the source of much jobbery, and every person that had any employment on them seemed bent only on providing for himself out of the revenues of the church. In this state of things, Michael Angelo reluctantly consented to superintend the future progress of the fabric; for it is distinctly on record that he was far from desirous of being employed.

The first use made of his authority by Michael Angelo was that of peremptorily discharging all the agents and employés of the place. A second time may the money-lenders be said to have been driven out of the temple which they profaned. That he might have more of the superiority of moral power over this worthless and venal set, he set the example of declining to receive the salary of six hundred crowns attached to his appointment. Thus he gratuitously superintended the works during a period of seventeen years, with a disinterestedness and devotion to his art, for which a parallel can scarcely be found.

In regard to his designs for the progress of the church, Michael Angelo began by undoing the whole of what his predecessor, San-Gallo, had executed. Having accomplished that object, his whole powers were directed towards carrying on the structure to such a point of advancement that no material change could possibly be made in his own plans, by the caprice of any subsequent architect. After having strengthened the great piers, vaulted over the nave, and carried up the exterior pedestal of the cupola—at the death of Pope Paul III, in the year 1549, the form of these parts of the building was unchangeably fixed; it was fortunate for the arts that he had taken this wise precaution. Under Pope Julius III, the successor of Paul, the mean intrigues which had always been carried on against our architect were vigorously renewed. He was accused of having contrived the arrangement without sufficient light, and of having changed without any reason everything which his predecessors had done. Every obstacle was thus thrown in his way which the jealousy of his disappointed rivals could effect.

But notwithstanding the severe trials he had to encounter, Michael Angelo steadily pursued his high and independent course; he felt that his own destiny and that of the fabric were identical, and notwithstanding all the unprincipled treatment to which he was exposed, he determined to stand to his post while life remained. Writing to Vasari at that time, he says, "For me to leave this place would be the cause of ruin to the Church of St. Peter, which would be a lamentable occurrence; and (on my part) a greater sin. As I hope to establish it beyond the possibility of changing the design, I could first wish to accomplish that end; if I do not already commit a crime by disappointing the many cormorants who are in daily expectation of getting rid of me." And in another letter written in reply to the pressing wishes of the Grand Duke to have him at Florence, he said, "I would prefer death to being in disgrace with the Duke. In all my affairs I have endeavored to adhere to the truth, and if I have delayed coming to Florence as I promised, the promise should have been construed with this condition, that I would not leave Rome until the fabric of St. Peter's was so far advanced as to prevent its being spoiled by others, and my design altered; nor will I leave an opportunity for those thieves to return and plunder, as has been their custom, and is still their hope. Thus placed by Divine Providence, I have exerted myself to prevent those evils; as yet, however, I have not been able to succeed in advancing the building to the point which I desire, from the want of money, and of workmen, and being old, and without any one about me to whose care I could leave the work; as I serve for the love of God, in whom is all my hope, I cannot now abandon it." It is impossible not to sympathize with the writer of such a letter as this; or to be unaffected by the simple and unbending honesty of Michael Angelo, independent, even, of all our admiration of his stupendous power as an artist.

At the advanced age of eighty-seven years, as his pedestal or tambor of the dome was then ready for the reception of the cupola, he made a small model in clay, for that important feature of the work. This model was afterwards executed in wood, under his own direction with complete accuracy; but immediate use could not be made of it at that time, because a want of funds prevented the farther progress of the building.

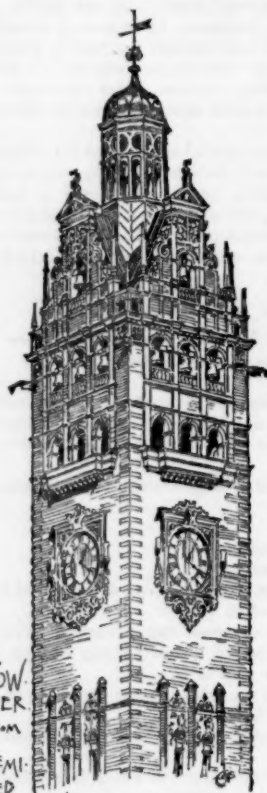
To the height of upwards of 28 feet above the exterior attic, the cupola is in one solid vault, whose diameter is nearly 139 feet at its springing, at which place its thickness is nearly 10 feet of solid stonework, exclusive of the thickness of the ribs. It then separates into two distinct vaults, one inside of the other; but as they are not concentric, the interval between them increases as they rise. At the point near the summit where they receive the lantern, they are 10 feet 7 inches apart. Thin partitions are dove-tailed into each shell to connect the two together, so that the whole is at once rendered light and firm; and it must be admitted that the construction of this dome proves the profundity of the architect's knowledge as a scientific builder to have equalled his high superiority as an architect.

After the death of Michael Angelo, which occurred in 1564, this cupola, with its lantern on the summit, was vigorously executed upon the model he had left by Jacopo della Porta, and Domenico Fontana. Thus the great artist's intentions were religiously respected in the completion of the edifice, until the time when Pirro Ligorio undertook its superintendence. This person attempting to depart from the model, and to substitute his own work instead, Pope Pius IV at once very wisely dismissed him from the situation.

I will proceed to a description of this church a little more in detail. The ground plan does not occupy a space quite equal to the Temple of Carnac in the Egyptian Thebaid; yet the Christian temple, rising in all to about six times the height of the other, gives it as a piece of construction, a very decided superiority.

The extreme length of St. Peter's is 720 feet; its breadth 510 feet; and the height from the pavement to the top of the cross, 500 feet. In the plan, the great western entrance bears some resemblance to that of the ancient Temple of Peace, also at Rome, and which has always been a favorite authority with the revived Italian school of artists, as well as with Wren, and the architects of that school in England. The entrance has seven passages into a porch 230 feet long, and 40 feet in width. The area of the nave, choir, and transepts, form a perfect Latin cross; but the space which is immediately under the dome, and encompasses the area of it, together with the body of the supporting piers, forms a square with a small circle attached to each of its angles. The whole arrangement is admirably disposed for simplicity, strength, and magnificence of effect. The side aisles, instead of extending continuously, so as to be of any consequence when viewed longitudinally, seem rather to consist of a number of distinct chapels, ranged along each side of the nave; but the whole interior of the fabric is so completely occupied by pilasters, columns, recesses, and niches, that nothing is left imperfect, and the breadth of the ground plan being so great in proportion to its length, conveys an idea of expansion and stability.

THE DUTIES OF THE ARCHITECT.¹



TOWER
FROM
PREMIATED
DESIGN BY NOTTINGHAM MUNICIPAL OFFICES
ENGR. F. H. OLPHAM. ARCHT.

WHEN I had the privilege of addressing you from this chair at the opening of the session of last year, you will recollect that I directed your attention to the duties of a surveyor; this evening I propose calling your attention to some of the duties of an architect. The subject being a large one, I can only, in the time at my disposal, take a cursory view of the important and salient points in architectural practice, which will present themselves to the young architect in the development of his practice, and, if the successful professional career of any of my hearers is in any way aided by the suggestions I may make, the end and aim of this short address will be accomplished. I propose to consider—first, the mode of procuring business; second, the legal position and responsibilities of the architect. The delicate question of what is strictly professional in procuring business is, I fear, open to the interpretation which each individual practitioner may, according to his temperament and opportunities, give to it. If it is borne in mind that the measure of respect, esteem, and confidence in which the young architect is held by the client and by his professional brethren is the safest and surest indication of his future success, he will steadfastly resist every temptation to avail himself of any unprofessional advantage or gain, feeling the certainty that such temporary advantage will ultimately prove one of the greatest hindrances to his professional advancement. One source of evil is the too anxious desire to commence practice before a sufficiently sound professional knowledge is obtained to render the young architect fit to undertake the competent discharge of professional responsibilities. The student should (as I have previously urged upon you) cultivate that branch of the profession for which he feels more especially fitted; and to this end he should, after his pupilage, for a time enter into one or more offices in which this special line of practice is most fully and eminently carried out, and during which time he will (most likely) be afforded opportunity for an introduction to a practice. But what is to be the young architect's guide on entering practice? It is right and proper that your energy and ability be exerted to the uttermost to obtain some share of the professional work which you see fall into the hands of, perhaps, less able practitioners. This first season of anxious waiting will be to you (as I too well know) most trying and difficult, requiring, in no small degree, the exercise of the consoling

fastly resist every temptation to avail himself of any unprofessional advantage or gain, feeling the certainty that such temporary advantage will ultimately prove one of the greatest hindrances to his professional advancement. One source of evil is the too anxious desire to commence practice before a sufficiently sound professional knowledge is obtained to render the young architect fit to undertake the competent discharge of professional responsibilities. The student should (as I have previously urged upon you) cultivate that branch of the profession for which he feels more especially fitted; and to this end he should, after his pupilage, for a time enter into one or more offices in which this special line of practice is most fully and eminently carried out, and during which time he will (most likely) be afforded opportunity for an introduction to a practice. But what is to be the young architect's guide on entering practice? It is right and proper that your energy and ability be exerted to the uttermost to obtain some share of the professional work which you see fall into the hands of, perhaps, less able practitioners. This first season of anxious waiting will be to you (as I too well know) most trying and difficult, requiring, in no small degree, the exercise of the consoling

¹ Address delivered to the Birmingham Architectural Association by the President, Mr. G. J. Bateman.

virtue of hope; but such time of waiting may, in many ways, be advantageously utilized in congenial honorary public work, in assisting architects of position, who will be glad to avail themselves of help in the special branch of the profession you have made your own. There is also competition and numerous other ways which will suggest themselves to the industrious. Nevertheless, patiently wait for legitimate opportunities for obtaining commissions, as (however few friends you may possess who are able to help you forward) such opportunities will occur. But what I wish especially to urge upon you is to make the best possible use of these legitimate opportunities when they do occur, by concentrating your whole energy, skill, and attention to this early work, from a conviction that your position in the profession will depend upon the ability, care, and thought bestowed upon it. By this means you will soon establish what is most needed—the confidence of your clients, which is the best possible mode of securing a permanent practice. However doubtful a mode of obtaining business “competition” may be,—from the too frequent miscarriage of justice, creating false hope, resulting in disappointment, mistrust, and envy,—if it be conducted on the lines laid down by the Institute it will at least afford you opportunity of proving your metal, and if the same spirit animates you as that which I have indicated should guide you in the work for your first clients it may prove, by such conscientious work, a ladder by which you may climb to distinction, as so many eminent members of the profession have so climbed before you. But let not temporary failure in competition, or any other legitimate mode of acquiring practice and position, induce you to deviate from upright and independent conduct, being ever careful to respect, by avoiding unprofessional interference with, the work of a brother architect. The accomplishment of such ends will, I believe, be furthered by unrestricted professional intercourse, which is encouraged by associations like our own; and perhaps a helping hand might more frequently be extended by the elder members of the profession to the struggling young architect. Nevertheless, you must feel no reticence in appealing to experienced brother professionals in your early trials and difficulties, as any architect worthy of the name will feel complimented by your solicitation for assistance and advice. The “legal position and professional responsibilities” of the architect are of the greatest importance in preventing misunderstanding with the client, and in avoiding the still greater evil of legal differences, as every professional legal dispute is not only disastrous to the litigant architect, but reflects upon the whole profession, for the avoidance of which it is only necessary to observe with ordinary care a few simple rules of practice; and should it ever be your misfortune to get into such troubles, instead of rushing into litigation follow the advice I have just given you, and consult some old and experienced brother professional, which will doubtless result in mediation.

I have thrown together short memoranda upon: The retainer of the architect; his responsibilities; quantities and tenders; certificates; extra works; arbitration; charges; and ownership of drawings. The young architect, in his anxiety to obtain work, is too apt to treat with indifference the client's retainer. The retainer should be a definite request, either verbal or written; if not the latter, it would be well that the retainer should be confirmed in writing, which can be readily introduced into the early correspondence; all conditional retainers should be regarded with caution, as they usually result in disappointment. A legal retainer for more than one year should be in writing, but this does not apply to engagements in building works which extend over one year. With the retainer the architect's responsibilities commence. Every architect undertakes, in the exercise of his professional duties, to bring a fair, reasonable, and competent degree of care and skill to their discharge, but he does not undertake to bring the highest possible degree of skill and judgment, yet the law requires that he shall be duly qualified to practise his profession, and he is liable for damages for negligence and unskilfulness.

Looking at the trust imposed upon the architect in his responsibility for, first, the vast amount of capital placed at his absolute disposal; second, the terrible (and generally fatal) consequence of failure from imperfect construction in design or in the execution of a structure; third, the lasting nature of the monument to his honor or to his disgrace which his buildings perpetuate—from these considerations you must feel the importance and gravity of your responsibilities, and the absolute necessity for their conscientious and competent discharge; and I would further add that the ill-devised, inconvenient, or inappropriate nature of your design, entailing upon the proprietor or building owner annoyance and loss, involves you, if not in legal responsibilities, in the serious charge of incompetence. If by faulty or insecure construction a calamity should occur (if not fatal) endangering life, it will remain a stigma upon your professional reputation through life. The crude deformity of a building from inartistic and unarchitectural design is a standing record of the incapacity of the architect instead of a contribution to “architecture,” which provides for the convenience and the magnificence of nations, and gives to them the lustré and prosperity which true civilization implies.

Quantities and tenders must be considered together, the former being the means of procuring the latter. The question of quantities having for so many years agitated the profession, a review of “professional practice” would be incomplete without some notice of it. In the early days of my practice quantities were unknown, as each builder made his own measurements and calculations, or employed a

surveyor to do so; but the growth of competition rendered the continuance of such a course impracticable, not only from the time it would occupy to procure tenders, but the expense and trouble entailed upon each competing contractor, which have brought about the present custom of quantities in procuring tenders. And this practice we must accept, it having obtained legal recognition; therefore, we have only to consider the best mode of procuring and making use of them. Exhaustive discussions have practically narrowed the issues to this: “Should the architect take out the quantities for his own work, or should they be taken out by an independent surveyor?” The strong view which was taken by the Institute against the provincial practice of the architect being the quantity-taker has been considerably modified in consequence of the concurrent testimony of provincial architects of eminence in support of the practice, although in London the quantity-surveyor continues to take them out. The advocates of the architect taking out his own quantities say: “If they are taken out by the surveyor, his responsibility to the builder for errors of omission is sufficient inducement to the surveyor (for his own protection) to take out his dimensions full;” also, “that from the advance in the science of quantity taking, the minute measurements and multiplication of items of the minor detail of the work (extending to many folios of the quantities) convey to the builder an exaggerated description of the works, and that this minute detail creates considerable difficulty in arriving at a just estimate of extra and omitted works at the completion of the contract, and often tends to increase the amount of extra works.”

Now, whatever force there may be in these arguments, I do not propose to adopt them as a reflection upon an educated and high-minded class of professional men, but raise the question on the simple ground of fitness and appropriateness of the provincial practice of architects measuring their own quantities. It is urged that the architect's duty extends only to the preparation of the necessary plans and specification for the proposed work; but with the preparation of the estimate or tender he has nothing legitimately to do. In reply, I think it the architect's duty to protect the building owner, and also to see ample justice done to the builder. It is, therefore, the province of the architect to see that the basis on which the tender is made is equitable both to employer and employed. It must be assumed that the architect knows more of the details of his plans than any one else, and by measuring up every portion of the works for quantities, such a minute review of every detail of construction enables him to prepare much more accurate specifications and working-drawings than he would do by delegating the quantity-measuring to other hands. The architect being the agent of the building owner, the builder might fairly ask, for his protection, that the quantities should form part of the contract. To this I shall presently refer. It is the duty of the architect, under the usual building contract, to ascertain the amount of extra and omitted works, and if he prepares the quantities on which the contract is made up, he is better prepared to perform his duty. Now, if the quantity-surveyor is employed, the preparation of the specification and the measuring up of the extra works would be more properly performed by the surveyor instead of the architect. It may be said that if the quantities become part of the contract, it becomes less material who prepares them so that the tender shall represent as nearly as possible the cost of the buildings; for such purpose I contend that the architect is as competent as the surveyor to perform the work.

An argument against the quantities forming part of the contract is that the builder's estimate is not a tender for the execution and completion of the buildings as shown on the plans, but is an estimate only for the works described and included in the bills of quantities; but no injustice is done to the building owner if he pays for such work only as is erected in the building by the contractor, whether it be included in the bills of quantities or not, and it is the duty of the architect in measuring up the extra work to ascertain and determine this, and it is much more just and equitable for the building owner to be called upon to pay for any works omitted from the quantities, than that the quantity-surveyor should be held responsible to pay for works done for the building owner.

Lastly, as to the payment for quantities: they are in all cases paid for by the building owner, the charge is included in the builder's tender, and if the building owner is made aware of this fact this course is not objectionable. Excepting in large contracts, when the charges for quantities are considerable, they should be paid directly to the architect by the building owner, as, if they are added to the builder's estimate, commission is paid to the architect upon the amount of these charges. In many instances when the quantity-surveyor has been employed, the architect has taken a share of his charges, but this is illegal, and the Institute having issued the following minute: “That such practice is deemed conduct which, in the opinion of the Council, is derogatory to the professional character,” will be sufficient to prevent the continuation of the practice. I would say, in concluding this somewhat long notice of this subject, that the income of the architect being considerably affected by the preparation of quantities (although a low ground on which to justify the practice), the work is one which (you will agree with me) the provincial architect is not in a position to give up without good and sufficient reason.

The “architect's certificate” is one of the important documents with which you will have to deal. The issue of a certificate is final and binding upon both the building owner and contractor, and there is no more certain way of breaking a contract than for

the building owner to refuse to honor a certificate. Therefore, the architect accepts the full responsibility of any error in the certificate he issues; consequently great caution is necessary, more especially as to the final certificate at the conclusion of the works, which determines the final balance of amount due in discharge of the contract, and which the contractor or building owner can only open by arbitration (to which I shall presently refer). Except in case of fraud, no architect's certificate can be ignored or set aside, showing the great importance of the document and the consequent responsibility attached to certificates.

"Extra works" is a subject on which the solicitude of the young architect cannot be too anxiously directed, as, if there is one subject more than another on which the client is likely to raise an issue with his architect it is "extra works," more professional dissatisfaction having been caused by inattention to the insidious accumulation of extras than by any other cause. One precaution against "unexpected" extras is for the architect to prepare his own quantities, by which there would be less probability of omitting from the specification any portion of the necessary works which are usually discovered at the completion of the contract. Extras will necessarily arise from alterations made by the building owner during the progress of the works, for which it is advisable to have definite estimates; and if this is not practicable from the nature of the work, weekly statements should be kept of the time and materials, which should be frequently laid before the building owner, in order that he may be made acquainted during the progress of the work of the increased amount of expenditure. The clause in building contracts requiring that "written orders must be given for extras" should be scrupulously observed, as it brings before the architect and building owner the extras before they are executed. I may add that it has been legally held that drawings do not constitute an order for extras, although I think this decision would, in many cases, be subject to revision. The architect being paid by commission on the amount of expenditure, any large and unexpected increase in the cost of the buildings exposes the architect to the suspicion of the building owner that self-interest may have something to do with such increased outlay. In cases when buildings are erected on speculation or for investment, the increased cost very seriously affects the building owner. Thus the "pernicious extra" causes dissatisfaction and frequently alienates the confidence of the client, to the serious prejudice of the architect. It is, I trust, unnecessary for me to remind you of the illegality of an architect participating directly or indirectly in the profits arising from the works on which he is employed; all such surreptitious dealing entitles the building owner to full redress, and all contracts influenced by fraudulent gifts or commissions are void.

Until a comparatively recent date, the architect was universally constituted the sole arbitrator in the building contract, and from whose decision there was no appeal; but there are now few respectable contractors who will sign contracts which do not contain the arbitration clause, which gives a power of appeal against the architect's decision upon all matters except the perfection of the work, of which he is the sole judge and over which he retains absolute control. The architect being the agent of the building owner, although the architect is not legally one of the parties to the dispute or difference, he is usually the party who raises the dispute by requiring something to which the contractor objects. Now, under such circumstances, it must be admitted that the contractor's objection to constitute the architect arbitrator is not unreasonable. I do not think the architect suffers any loss of dignity by surrendering to an independent arbitrator the determination of disputes under the contract, but is relieved from much responsibility, and is more free to act independently in the service of his client, the building owner, in carrying on the work, and, as the architect's act can be reviewed, it is a salutary check upon his hasty decision. Doubtless building arbitration is expensive, troublesome and vexatious, the necessity for which it should be the anxious care of the architect to avoid. Although I hold in the highest admiration the perseverance, great ability, and high integrity of the legal profession, I am disposed to think, in building cases requiring special technical knowledge, that an able and experienced architect should universally be appointed arbitrator, with the assistance of a legal assessor when necessary.

It is erroneously believed that the customary and usual commission of five per cent is a legal one. For uniformity of practice the Institute has issued a scale of professional charges to which the architect is fairly entitled, and these charges can be recovered in a court of law, if such customary commission can be proved to be a fair and reasonable charge for the work done. The words of a recent judgment are: "No body or society have any right whatever to fix the charges at certain sums; it is a mere question of 'quantum meruit,' that is, the measure of value of the work done." Therefore, although the architect's usual commission of five per cent is seldom objected to by a client, except under the special circumstances of a large, very plain building, or when many portions of a building are in duplicate, the commission must not be assumed to be a legal charge, recoverable as a commission, without proof that for the work done the charge is fair and reasonable. Under such circumstances it is the safest course for you to enter in your diary each day's work of yourselves and clerks, with all expenses and outgoings. With such a corroborative proof of time, labor, and expense expended in the work, you may have little fear of recovering the amount of your commission according to the Institute scale.

"The ownership of drawings" on the completion of the works has

been a vexed question, which has resulted in the architect being unable to retain the drawings, if requested to give them up to the building owner. It has been contended that, as the drawing is the vehicle or tool by the use of which the architect provides the client with the building required, it cannot, in fairness, be claimed by the building owner; but it must be borne in mind that the building owner pays for the plans, and a separate charge for them is recognized by the Institute scale; therefore he would appear to be entitled to them. If, during the progress of the works, the building owner requires, for furnishing or any other purpose, copies of the plans, he would be furnished with them. Therefore, however reluctant we may be to part with our drawings, we certainly have no legal claim upon them after our charges are paid, and in this respect we are no worse off than the solicitor whose client claims his papers; but in the few cases which occur when drawings are demanded, we must be satisfied with keeping copies. I beg, in conclusion, to add a word of warning. Although the young architect should possess

"The keen spirit, which seizes the prompt occasion,
Makes the thought start into action,
And at once plan and perform, resolve and execute,"

I would bid him beware of restless ambition, which,

"Like a circle in the water,
Never ceases to enlarge itself,
Till, by broad spreading, it disperses to nought."

Amid all the changes and chances of a checkered professional career, I would suggest for your professional shield, "purity and strength."

PAPER AND CONCRETE CHIMNEYS.

501 CALEDONIAN ROAD, HOLLOWAY, LONDON, ENGLAND,
November 22, 1883.

TO THE EDITORS OF THE AMERICAN ARCHITECT:—

Dear Sirs,—Will you kindly allow me to ask through your columns if any one in America has built a *paper chimney*, or can some subscriber give a description or details of the paper chimney erected in Breslau? It is stated to be fifty feet high, and by a chemical preparation is rendered fire-proof (?), and also impervious to water. Also, I wish to ask if any chimney stalks have been built in America of concrete. I know there is one at South Dock, Sunderland, England, about fifty-six feet high from ground, and I should like to hear of any others that may have been erected.

Hoping you will please favor me by allowing these queries to appear in your paper, I am, sir, Yours faithfully,

R. M. BANCROFT.

BRICK PIERS.

NEW YORK, December 8, 1883.

TO THE EDITORS OF THE AMERICAN ARCHITECT:—

Dear Sirs,—In the article on the catastrophe at Madison, Wisconsin, published in your issue of the 1st inst., it is claimed "That the fall of the structure was due to the failure of the brick piers upon which the columns rested which supported the floors and roof of the ruined building." Whether it be true or not it seems very likely to have been the case. It has been found in this city that a large number of brick piers were insufficient to sustain with safety the load upon them, leading to the conclusion that no calculation as to their strength was ever made. Not only this, but a large number of plans are presented to the Bureau of Inspection of Buildings, showing that no attempt was made to proportion the brick piers to the columns above and the weight to be imposed—numerous instances have occurred wherein it was proposed to impose from twenty to fifty tons per square foot on the brick piers.

While on this subject I may be permitted to say that I do not approve the practice of using bond-stones in brick piers for the reason that the bonding of the brick is amply sufficient, and that the bedding of the bond-stone is not to be trusted to the average workman. Neither do I approve of the practice of running up the outside face-brick of the piers, and then grouting the inside courses; far better to lay all the brick in courses at the same time, and with mortar of the same consistence as that used for the outer face of pier. I have found by experience that the interior of grouted piers settled below the outer course of brick, leaving the bond-stone in rapidly built piers bearing only on the outer or face-brick of pier. Whenever a pier is grouted with lime-mortar the cap-stone should not be put on until at least twenty-four hours thereafter, and this stone and iron base-plate, or both combined should be of sufficient thickness to receive the weight above and transmit it to the pier below, which in numerous instances I have found not to be the case.

Respectfully, W. P. E.

NEW APPLICATIONS OF LUMINOUS PAINT.—Some useful applications have lately been made in England of luminous paint where it is desirable to render objects visible in the dark, such as life and mooring buoys, numbers of vessels, dangerous rocks and headlands, a large rock having recently been painted. Perhaps the most striking application is the painting of the mariner's compass on board ship, by which means it is rendered clearly visible, and the course can be easily kept should the lamp be extinguished.

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.]

289,796. STEAM-BOILER. — George H. Asire, South Bend, Ind.
 289,802. HEATING-STOVE. — Philo D. Beckwith, Dowagiac, Mich.
 289,804. DOOR-BELL. — Ellis S. Bloomfield, Jr., Jersey City, N. J.
 289,811. DECORATING CEILINGS AND WALLS. — Frederick E. Cheesman, Flushing, N. Y.
 289,821. CUT-OFF FOR CONDUCTORS. — W. Frank B. Fisher, Springfield, O.
 289,831. STENCH-TRAP. — Charles Halstead, New York, N. Y.
 289,832. WINDOW-BLIND. — Jacob B. Hartman, Wooster, O.
 289,840. HEATING-STOVE. — Samuel Ingling, Dowagiac, Mich.
 289,847. WATER-BACK AND BOILER-FITTING FOR RANGES. — James McGinley, Chicago, Ill.
 289,849. FIRE-LOCK. — Ernest K. Michaelis, Sycamore, O.
 289,858. DISINFECTANT. — George E. Rice, Boston, Mass.
 289,868. PAINT. — Albert Sorg and Franklin D. Phillips, Ann Arbor, Mich.
 289,869. FIRE-EXTINGUISHING APPARATUS AND ESCAPE. — Patrick Henry Spelman, New York, N. Y.
 289,876. FIRE-ESCAPE LADDER. — Robert M. Wilson, Brooklyn, N. Y.
 289,880. DOOR-HANGER. — Caleb Brinton, Chicago, Ill.
 289,886. DOOR-HANGER. — Caleb Brinton, Chicago, Ill.
 289,900. PROTECTING IRON WATER-PIPES FROM RUST. — Frederick Eaton, Los Angeles, Cal.
 289,905. SAFETY-APPLIANCE FOR ELEVATORS. — Alfred Fitzroy, Brooklyn, N. Y.
 289,908. FIRE-ESCAPE. — John Griesenauer, Dardenne, Mo.
 289,924. FIRE-ESCAPE. — John B. Morris, New York, N. Y.
 289,937. BASIN AND WATER-CLOSET VALVE. — Holland Smith, San Francisco, Cal.
 289,948. DEVICE FOR JOINING LUMBER. — Clarence A. Williams, Webster City, Iowa.
 289,961. DOOR-HANGER. — Frank Birmingham, Hornellsville, N. Y.
 289,963. FURNACE. — Virgil W. Blanchard, New York, N. Y.
 289,965. STEAM-RADIATOR. — George B. Boomer, Tarrytown, N. Y.
 289,967. HOT-AIR FURNACE. — Charles B. Boynton, New York, N. Y.
 290,007. FIRE-ESCAPE. — James H. Downing, Lane, Kans.
 290,024. LOCK AND LATCH. — Henry Hersee Freeman, Milton, Ontario, Can.
 290,041. VENTILATOR. — David Groesbeck, New York, N. Y.
 290,048. SELF-CLOSING HATCHWAY. — Charles C. Hartung, St. Louis, Mo.
 290,071. WINDOW-SASH. — Tolbert Lanston, Washington, D. C.
 290,076. FIRE-ESCAPE. — Miles K. Lewis and Euclid Sanders, Hastings, Neb.
 290,080. FIRE-ESCAPE. — W. Clay Lutz, Bedford, Pa.
 290,084. COMBINED REGISTER AND VENTILATOR. — William H. Maxfield, Maysville, Ind.
 290,093. DOOR-HANGER. — David Nickel, Morris, Ill.
 290,119. HASP-HOOK. — Geo. H. Sargent, New York, N. Y.
 290,133. METALLIC PLASTERING-SURFACE. — Jas. Stanley, New York, N. Y.
 290,172. AIR-HEATER FOR FURNACES. — Virgil W. Blanchard, New York, N. Y.
 290,177. FIRE-ESCAPE. — John Miner Cunningham, Florida, Ill.

SUMMARY OF THE WEEK.

Baltimore.

BUILDING PERMITS. — Since our last report six permits have been granted, which are as follows: —
 M. J. Sappington, three-story brick building, e s McCulloch St., n of Prentiss St.
 D. F. Haynes & Co., two-story brick building, 26' x 71', s w cor. Nicholson and Decatur Sts.
 Lineweaver & Co., one-story brick building, 20' x 52', s s Granby St., between East Falls Ave. and Albemarle St.
 Jas. J. Sullivan, two-story brick stable, in rear of 139 Dallas St.
 Francis Krug, three-story brick building and two-story brick stable, n e cor. Central Ave. and Biddle St.
 Josephine L. Slaughter, three-story brick building, w s Stirling St., between Madison and Chew Sts.

Boston.

BUILDING PERMITS. — Brick. — Marlborough St., Ward 11, for Robert Bradley, dwell., 24' x 65', four-story flat.

Parker St., rear, near Boylston St., Ward 22, for Samuel G. Snelling, carpet-beating building (iron), 28' x 40', two-story flat; J. D. Payne, builder.
 Baldwin St., near Northampton St., Ward 18, for Hancock Inspirator Co., factory, 76' x 175', four-story; ell, 38' x 56'; Gooch & Pray, builders.

Wood. — Woodville Sq., off Cottage St., Ward 20, for Guy A. Clifford, dwell., 15' x 19', and 22' x 32', two-story pitch; Guy A. Clifford, builder.
 Eutaw St., No. 118, Ward 1, for Chas. E. Day, dwell., 16' x 18' 6" and 21' x 29', two-story mansard; Frame & Patten, builders.

Gilbert St., near Centre St., Ward 23, for Owen Nawn, dwell., 26' x 38', three-story flat; Stephen McNeill, builder.

Gardner St., near Chester St., Ward 25, for Chas. H. B. Breck, dwell., 16' x 17' and 22' x 26', two-story pitch; Daniel M. O'Connell, builder.

Gates St., No. 81, cor. East Eighth St., No. 312, Ward 15, for Henry B. Stratton, dwell. and store, 22' x 38', three-story flat; Henry B. Stratton, builder.

Gates St., No. 79, Ward 15, for Henry B. Stratton, dwell., 22' x 24', three-story flat; Henry B. Stratton, builder.

Woodville Sq., off Cottage St., Ward 20, for Guy A. Clifford, dwell., 14' x 16' and 19' x 30', two-story pitch; Guy A. Clifford, builder.

Cliff St., rear, near Glenwood St., Ward 21, for G. A. Brackett, mason's locker, 16' x 40', one-story flat; G. A. Brackett, builder.

Franklin St., near Lincoln St., Ward 25, for C. E. Dearborn, dwell., 24' and 30' x 32', two-story pitch; C. E. Dearborn, builder.

E St., No. 225, Ward 13, for Chas. Reedes, dwell. and store, 22' x 36', three-story flat; P. F. Hanlon, builder.

Elliot St., near Pond St., Ward 23, for Charles Penhallow, dwell., 27' x 47', two-story pitch.

Warren St., Nos. 25, 27 and 29, Ward 21, for Francis A. Brooks, carriage-manufacture, 50' and 50' 6" x 78' and 81', three-story mansard; Warren Hayford, builder.

Lauriat Ave., near Norfolk St., Ward 24, for G. W. Goodale, 2 dwells., 14' x 19' and 22' x 31', two-story pitch.

Cliff St., Nos. 28 and 30, Ward 21, for George W. Brackett, 2 dwells., 20' x 40', three-story flat; Geo. A. Brackett, builder.

Elm St., near Ford St., Ward 1, for Thomas Yeomans, carpenter-shop, 18' x 24', one-story pitch; Thos. Yeomans, builder.

South St., near Washington St., Ward 23, for Patrick Devine, 2 dwells., 19' x 28', two-story pitch; D. Johnstone, builder.

Bennett St., near Parsons St., Ward 25, for Pierce Quirk, dwell., 22' and 30' x 30', two-story pitch; Pierce Quirk, builder.

Hyde Park Ave., near Wakefield St., Ward 23, for Richard White, 11' x 15' 6" and 21' x 52', two-story pitch; Dougall McDonald, builder.

Brooklyn.

HOUSE. — For Mr. J. C. Hoagland a four-story and basement residence, brick, with brownstone finish, 38' x 75', is to be built at No. 366 Clinton Ave., from designs of Messrs. Parfitt Bros., at a cost of about \$60,000.

BUILDING PERMITS. — Quincy St., s s, 100' e Bedford Ave., 2 three-story brownstone front dwells., tin roofs; cost, total, \$11,500; owner, Mrs. Creighton, 179 Quincy St.; architect, T. F. Houghton.

Park St., Nos. 16 to 22, s s, 150' e Broadway, 4 three-story frame double tenements, tin roofs; cost, each, \$4,300; owner, Catharine Strawn, 11 Lewis Ave.; architect, T. Engelhardt; builder, Geo. Straub.

Flushing Ave., No. 867, n s, 260' e Broadway, tin roof; cost, \$3,600; owner, Mrs. J. Hecht, 607 Broadway; architect, A. Herbert; builders, J. Raith and C. Schneider.

Central Ave., n w cor. Hiram St., two-story frame tenement, tin roof; cost, \$2,400; owner, Robert Seabury, 135 Central Ave.; builder, W. H. Nicholls.

Prospect Pl., Nos. 202 and 204, s s, 241' 10" w Vanderbilt Ave., 2 three-story brick dwells., tin roofs; cost, each, \$2,500; owners, J. H. Hill, 393 Flatbush Ave., and P. B. Rogers, 119 or 129 Prospect Pl.; carpenter, Geo. Schaefer.

Lorimer St., No. 490, e s, 350' n Van Cott Ave., three-story frame double tenement, tin roof; cost, \$5,500; owner, Peter Kohlman, 492 Lorimer St.; architect, J. F. Smith; builder, Jno. Brundell.

DeKalb Ave., n s, 221' e Evergreen Ave., three-story brick store and tenement, tin roof; cost, \$4,000; owner, Hugh O'Brien, 231 Evergreen Ave.; builders, H. McZulken and P. F. O'Brien.

Ellery St., Nos. 94 and 97, s s, 110' e Marcy Ave., 2 three-story tenements, tin roofs; cost, each, \$3,500; owners and builders, Geo. Lehman & Sons, 321 South Fifth St.; architect, T. Engelhardt.

Park Pl., n s, 133' 10" e Fifth Ave., 4 two-story brownstone front dwells., tin roofs; cost, each, \$5,000; owner, architect and builder, Jno. V. Porter, 164 Park Pl.

Twelfth St., n s, 100' w Third Ave., 4 three-story frame tenements, tin roofs; cost, each, \$4,000; owner, F. L. Corwin, 108 Wall St., New York City; architect, J. H. Herbert.

Twelfth St., n s, 296' 6" e Fifth Ave., 3 two-story brownstone front dwells., tin or gravel roofs; cost, each, \$7,000; owner, Jno. C. Bushfield, 64 Utica Ave.; architect, R. H. Heasman.

Seventh Ave., e s, 147' s Carroll St., 4 three-story brownstone front dwells., tin roofs; cost, each, \$7,500; owner, Henry Lonsdell, Ninth St., cor. Seventh Ave.; architect and builder, A. V. B. Bush; mason, Jacob Brown.

Evergreen Ave., s w cor. Ralph St., three-story frame store and tenement, tin roof; cost, \$3,500; owners and architects, Young & Lamb, 64 Bushwick Ave.

Garfield Pl., n s, 290' 9" w Sixth Ave., 4 two-story brownstone front dwells., tin roofs; cost, each, \$5,000; owner and builder, Edward H. Mowbray, 317 Seventh St.; architect, W. J. Conway.

Buffalo, N. Y.

BUILDING PERMITS. — Frame house, Ellicott St., near Carrollton St.; cost, \$11,000; owner, J. Fischer; architect, G. J. Metzger.

Frame house, Clinton Ave.; cost, \$5,000; owner, F. F. Umbmann; architect, G. J. Metzger.

Police headquarters and Station No. 1, on the Terrace; cost, \$58,000; architect, M. E. Beebe.

Stone dwelling-house, North St.; cost, \$23,000; owner, Mr. Andrew Langdon; architect, James G. Cutler.

Addition to the "Sanitarium;" owner, Dr. R. V. Pierce, Main St., near Tupper St.; architect, A. C. Eisewein.

Brick residence, Allen St.; cost, \$8,000; owner, Mrs. D. C. Weed; architect, C. R. Percival.

STABLE. — North Division St., cor. Spring St., brick stable; cost, \$7,500; owner, A. J. Benzing; architect, G. J. Metzger.

Chicago.

CHURCH AND SCHOOL. — Solomon Wheeler, of this city, has deeded the Episcopal church a valuable tract of land in the western division of the city, and advanced \$200,000 towards the erection of a church and preparatory school.

FACTORY. — Wm. Strippelman, architect, planned the four-story and basement factory, dry-house and engine-house, for Olbrich & Golbeck; cost, \$17,000.

FLATS. — Wm. Strippelman, architect, has the following flats under construction: —
 Six two-story and cellar flats, for Marshall & Paulett; cost, \$30,000.

Two-story and cellar flat, 25' x 60', Trenton brick, stone trimmings, for Mary E. Shonk; cost, \$7,000.

Two-story basement and attic flats, 25' x 60', for A. Dressel; cost, \$6,000.

Two-story flat, 20' x 50', for Peter Ray; cost, \$5,000.

STORES AND FLATS. — The following stores and flats, planned by Wm. Strippelman, architect, are now being erected: —

Three three-story stores and flats, 70' x 75', for Wm. Fitzgerald; cost, \$25,000.

Three three-story stores and flats, 70' x 75', for John Gerstler; cost, \$25,000.

Three-story store and flats, 68' x 109', for J. Moeller & Son; cost, \$18,000.

Three-story store and flats, 24' x 65', for G. Schneider; cost, \$7,500.

Three-story store and flats, 24' x 55', for B. Stein; cost, \$7,000.

Three-story and basement store and flats, 25' x 60', for J. Stornberger; cost, \$7,000.

Two-story store and flat, 24' x 72', for J. Boland; cost, \$7,000.

Two-story store and flat, for T. Katz; cost, \$5,000.

TENEMENT-HOUSE. — Wm. Strippelman is architect of the four-story brick tenement-house, 22' x 66', to be built for D. Zemansky; cost, \$7,500.

BUILDING PERMITS. — F. Goetowski, two-story dwell., 972 North Paulina St.; cost, \$2,800.

A. Stupka, two-story dwell., 2556 Dashiell St.; cost, \$3,200.

Newberry Estate, five-story factory, 78' x 78', Illinois St.; cost, \$40,000; architect, F. H. Waecher; builder, Thos. Nicholson.

Thomas Dowling, 9 three-story dwells., Jackson St., cor. Wood St.; cost, \$50,000; architect, W. A. Furber; builder, Geo. Lehman & Co.

H. B. Sortman, 5 two-story dwells., 3219 to 3229 Vernon Ave.; cost, \$10,000; architects, Wheelock & Clay; builders, Geo. Lehman & Co.

Carter H. Harrison, three-story store and dwell., 73 and 75 Fourth Ave.; cost, \$10,000; architect, J. J. Flander.

Detroit.

BUILDING PERMITS. — George Hatt, brick dwell., 90 Garfield Ave.; cost, \$4,500.

J. V. Smith, frame stores, 824-830 Gratiot Ave.; cost, \$8,000.

J. L. Lyons, brick dwell., 32 Davenport St.; cost, \$8,000.

Geo. Watkins, 2 brick dwells. and barns, 427-429 Third St.; cost, \$8,000.

A. C. Varney, brick dwell., 40 Canfield Ave.; cost, \$14,000.

Mason & Rice, frame dwell., Henry St.; cost, \$5,000.

Mason & Rice, brick house, 34 Sibley St.; cost, \$4,500.

H. W. Holcomb, brick dwell., 199 Fourth Ave.; cost, \$4,300.

Board of Education, brick school-house, Harper Ave.; cost, \$7,000.

Henry Carew, brick and wood store, 239 Campan Ave.; cost, \$3,000.

Mason & Rice, brick dwell., 148 McDougall Ave.; cost, \$10,000.

Frank A. Dejat, brick store and dwell., 999 Michigan Ave.; cost, \$5,000.

Julius Hess & Co., brick dwell., 29 Garfield Ave.; cost, \$7,400.

D. Whitney, Jr., brick and stone store, Woodward Ave.; cost, \$40,000.

New York.

HOUSES. — For Mr. Richard Deeves, plans for four more private residences have been drawn by Messrs. D. & J. Jardine, to be built on the s s of Eighty-third St., 100' e of Ninth Ave. Two will have frontages of 18', one 19', and one 20', all by 52'; cost, about \$88,000; fronts, Philadelphia brick with stone trimmings.

Ten residences will be built for Mrs. Flora Sawyer, on the west side of Alexander Ave., from One Hundred and Thirty-seventh to One Hundred and Thirty-eighth St., from designs of Mr. John Rogers; cost, about \$90,000.

On One Hundred and Forty-second St., s s, 300' e of Willis Ave., Mr. Wm. O. Gorman will build 4 three-story and basement dwells., brick and brownstone fronts, 18' 9" x 45' each; cost, \$75,000.

BUILDING PERMITS. — One Hundred and Twenty-eighth St., s s, 245' e Tenth Ave., two-story brick store-building, gravel roof; cost, \$15,000; owner, D. G. Yuengling, 1 East Sixty-second St.; architect, Paul F. Schoen; builders, J. & L. Weber.

One Hundred and Fifty-sixth St., n s, 300' w Elton Ave., 2 three-story frame dwells., tin roofs; cost, each, \$2,200; owner, Peter Kleemann, 116 Essex St., builders, C. Haffen and Geo. Folger.

Second St., n s, 225' e Second Ave., 4 four-story brownstone front tenements, tin roofs; cost, each,

\$15,000; owner, Jacob L. Maschke, 113 Rivington St.; architect, John C. Burne.

Fifty-seventh St., n. s. 150' e Lexington Ave., three-story brick stable and dwell., tin roof; cost, \$16,000; owner, D. B. Payerweather, 115 East Fifty-seventh St.; architects, Chas. Romeyn & Co.; builders, Alex. Brown, Jr., and Guy Culvin.

One Hundred and Twenty-third St., s. s. 211' 4" w Third Ave., three-story brick stable, tin roof; cost, \$12,000; owner and mason, Jere C. Lyons, 212 One Hundred and Twenty-seventh St.

West Fifty-fourth St., No. 1004, five-story brick dwell., tin roof; cost, \$8,000; owner, Aug. Brackman, 963 Sixth Ave.; architects, Miller & Reickert.

Eighty-eighth St., s. s. 160' s Third Ave., 4 five-story brick tenements, tin roofs; cost, each, \$14,000; owner, John G. MacDonald; 1532 Park Ave.; architect, A. B. Ogden.

One Hundred and Fifteenth St., n. s. 200' w Fifth Ave., two-story brick stable, slate roof; cost, \$5,000; owner, Morris S. Hermann, 9 and 11 Franklin St.; architect, Geo. W. da Cunha.

South Fifth Ave., No. 53, five-story brick factory, metal roof; cost, \$20,000; owner, Lorillard Spencer, 3 Mercer St.; architect, Jno. B. Snook.

Sixty-eighth St., n. s. 125' w Eleventh Ave., 3 five-story brick tenements, tin roofs; cost, each, \$12,000; owner, E. Wadsworth, St. Ann's Ave., cor. One Hundred and Forty-seventh St.; architect, C. Baxter.

West Forty-third St., No. 335, five-story brick tenement, tin roof; cost, \$18,000; owners, L. and L. K. Ungrich, 160 West Thirty-third St.; architect, M. L. Ungrich.

Tenth Ave., e. s. Forty-eighth to Forty-ninth Sts., five-story brick tenements and stores, tin roofs; cost, two, \$12,000 each and six, \$15,000 each; owner, Wm. Rankin, 338 West Forty-seventh St.; architect, M. L. Ungrich.

Fifty-sixth St., s. s. 325' e Tenth Ave., 2 five-story brick tenements, tin roofs; cost, each, \$20,000; owner, Wm. Henderson, 512 East Eighty-second St.; architect, John C. Burne.

Tenth Ave., Nos. 508, 510 and 512, 3 five-story brick tenements and stores, tin roofs; cost, each, \$14,000; owner, Margaret E. Niebuhr, 131 East One Hundred and Twelfth St.; architect, Geo. W. da Cunha.

Eleventh Ave., w. s. 29' 9" s Sixty-ninth St., 2 five-story brick tenements and stores, tin roofs; cost, each, \$15,000; owner, John Wm. Guntzer, 76 Second Ave.; architect, J. T. Brett; builders, Robert Shaw and Watkins Bros.

Sedgwick Ave., w. s. 800' s Morris Dock Station, two-story frame dwell., slate and tin roof; cost, \$3,000; owner, John Biggart, 247 West Eighteenth St.; architect and carpenter, Wm. Biggart.

Prospect Ave., n. e. cor. Isaac St., Fordham, two-story frame dwell., shingle roof; cost, \$3,000; owner, Henry D. Puroy, cor. Berrian Ave. and Isaac St.; architect, Arthur Arctander.

Sixty-ninth St., s. s. 200' w Eleventh Ave., 4 five-story brick tenements, tin roofs; cost, each, \$15,000; owner and builder, Richard Claffy, 903 Bushwick Ave., Brooklyn; architect, Elbert D. Howes.

Alterations. *West Fifty-second St.*, Nos. 314 and 315, raise masonry to full story, four-story brick extension and internal alterations; cost, \$10,800; owners, Jas. H. Lyon; 314 West Fifty-second St. and Sarah M. Horn, 316 West Fifty-second St.; architect, Wm. Bedell; builder, not selected.

Ann St., n. e. cor. Theatre Alley, internal alterations; cost, \$5,500; owner, Isabella Goff, 355 West Thirty-fourth St.; architect, Jas. E. Ware; builders, Robinson & Wallace and J. C. Wessells.

West Forty-second St., No. 500, cor. Tenth Ave., show-windows on street and avenue, and internal alterations; cost, \$5,000; Henry A. Smith, 460 West Forty-fourth St., lessee, the Paper-Hangings Mfg of the Geo. W. Allen Company (limited), on premises; architect, Jacob M. Mould; builders, Amos Woodruff & Sons.

Park Ave., n. w. cor. Forty-first St., rebuild walls of upper story, and internal alterations, flats; cost, \$8,000; owner, Chas. Duggin, 310 Madison Ave.; architects and builders, Chas. Buck & Co.

Nassau St., No. 120, roof of main building raised, extension to be raised three stories; cost, \$5,000; owner, Wm. Kramer, 50 Bowery; architect, J. Kastner.

Philadelphia.

BUILDING PERMITS. — *Twentieth St.*, cor. Glenwood Ave., two-story planing-mill, 55' x 65'; Chas. Blanchard.

Market St., No. 4025, rear of, two-story bakery and stable, 40' x 40'; R. W. Strode, contractor.

Girard Ave., e. of Sixty-third St., two-story stable, 22' x 50'; Kister & Orem.

Market St., No. 731, third story addition to store, 24' x 50'; Jno. Foreman, contractor.

Thirty-first St., n. e. cor. Thompson St., two-story ice house, 52' x 52'; Jas. B. Doyle, contractor.

Broad St., n. of Cambria St., two-story feed-store, 40' x 50'; Geo. M. Christman, owner.

Twenty-first St., n. of Johnson St., 3 three-story dwells, 15' x 12'; Chas. W. Budd, owner.

Sixteenth St., between Tioga and Ontario Sts., three-story dwell., 16' x 33'; Jacob Blum, owner.

Park Ave., s. of Susquehanna Ave., three-story school-house, 45' x 55'; K. J. Dobbins.

Sixth St., n. of Cambria St., two-story dwell., 17' x 44'; W. Tecklenburg, contractor.

Centre St., w. of Thirty-sixth St., 3 two-story dwells, 14' x 40'; W. S. Shedwick & Bro.

Lewis St., between Tioga and Venango Sts., two-story dwells, 14' x 30'; Geo. Luchendorf, owner.

Huntington St., cor. Franklin St., 3 two-story dwells, 15' x 45'; also, one-story store and dwell., 16' x 45'; Jno. Loughran.

Sixteenth St., n. of Moore St., three-story dwell., 16' x 41'; Hugh Moody, owner.

PROPOSALS.

COURT-HOUSE.

[At Marion, O.]
MARION, O., December 4, 1883.
Notice is hereby given that sealed proposals will be received at the Auditor's Office, at Marion, O., up to

PROPOSALS.

1 o'clock, P. M., on the 4th day of January, 1884, for the furnishing of materials and labor required in the construction of a fire-proof court-house for Marion County, O., as per plans and specifications by D. W. Gibbs & Co., architects, now on file at the Auditor's Office of said county.

Each proposal must be accompanied by a good and sufficient bond in the sum of one thousand dollars, conditioned that, if awarded the work, he or they will enter into a contract and give the bond required in specifications.

Blank bids will be furnished by the Auditor. The right reserved to reject any or all bids. By order of the Commissioners.

418

B. F. WAPLES, Auditor.

SCHOOL FURNITURE.

[At Cincinnati, O.]

Sealed proposals will be received at the Office of Public Schools until Monday, December 24, 1883, at 12 M., for furniture and repairs of furniture for one year, according to specifications on file in said office.

Each bid must contain the name of every person interested therein, and must be accompanied by a sufficient guaranty by some disinterested person, that if the bid is accepted a contract will be promptly entered into, and the performance of it properly secured.

Bids must be upon blank forms, to be obtained in said office.

The right is reserved to reject any and all bids. Bids must be addressed to

417

GUSTAV R. WAHLE,
Chairman Committee on Furniture.

FOUNDATION CRIB.

[At Sand Beach, Mich.]

OFFICE OF LIGHT-HOUSE ENGINEER,
ELEVENTH DISTRICT,
DETROIT, MICH., December 13, 1883.

Sealed proposals, in duplicate, will be received at this office until noon of Thursday, the 27th day of December, 1883, for building and putting in position a foundation crib for a light-house at the Harbor of Refuge, Sand Beach, Mich.

Plans and specifications can be seen at this office, where blanks for making bids, with necessary bonds, etc., can be had on application.

The right is reserved to reject any or all bids, and to waive any defects.

417

CHAS. E. L. B. DAVIS,
Captain of Engineers, U. S. Army.
Engineer Eleventh Light-house District.

SEWER.

[At Buffalo, N. Y.]

December 13, 1883.

Sealed proposals will be received by the Board of Sewer Commissioners of the City of Buffalo, N. Y., at No. 31 City and County Hall, in said city, till Friday, December 28, 1883, at 3 o'clock, P. M., for the construction of the outlet section of the Buffalo Trunk Sewer, in accordance with plans and specifications on file in the office of the Engineers, No. 41 Chapin Block, in Buffalo.

Each proposal must be accompanied with a bond in a penalty of 25 per cent of the bid, executed by two sureties residing in the State of New York, conditioned that the successful bidder will execute the contract and give security therefor, as required by the specifications.

The Commissioners reserve the right to reject all bids.

417

D. C. BEARD,
Chairman Board Sewer Commissioners.

HEADSTONES FOR NATIONAL CEMETERIES.

OFFICE OF NATIONAL CEMETERIES,
WASHINGTON, D. C., December 12, 1883.

Sealed proposals, in triplicate, with a copy of this advertisement attached to each, will be received at this office until 12 o'clock, noon, Tuesday, January 15, 1884, for furnishing three thousand headstones, more or less, of American white marble, for unmarked graves of Union soldiers, under the provisions of the acts of Congress of March 3, 1873, and February 3, 1879.

Specifications for the work, blank forms of proposals, and all necessary information on the subject, will be furnished on application to this office.

Proposals are required to be submitted on the forms supplied for the purpose.

The right is reserved to reject any or all bids.

Bids should be endorsed "Proposals for furnishing Headstones," and addressed to the undersigned.

418

R. N. BATCHELDER,
Deputy Q. M. Gen. U. S. Army.

MISCELLANEOUS SUPPLIES.

[At Philadelphia, Pa.]
OFFICE PHILADELPHIA GAS-WORKS.

Sealed proposals will be received until 2 P. M., Monday, December 24, 1883, for the furnishing in such quantities, at such times, and to such stations as directed by the undersigned, of all the supplies of the following kinds required by this Department during the year 1884:—

Paints, oil, turpentine, varnishes, etc.
Lumber, hardware, iron and steel.
Window and lamp glass, B. H. matches.
Wrought-iron tubing, fittings, lamp rods and bonds.
Street lanterns, lamp stems, burner-cleaners.
Lamp posts, stop-box rims and covers.
Pig-lead, lead pipe, block tin.
Lubricating oil, etc.; stationary for Works.
Brass, service and meter cocks, valves and screws.
All brass work to be of heavy patterns and Philadelphia manufacture.

Schedules of the different kinds and amounts required can be seen at the office, southwest corner Twenty-second and Filbert Streets.

The right is reserved of rejecting any or all bids deemed prejudicial to the interest of the Works.

Address to the undersigned, at office, No. 20 South Seventh St., endorsed "Proposals for—(here state description of goods)."

417

WM. K. PARK, Chief Engineer.

PROPOSALS.

WATER-WORKS.

[At Fort Smith, Ark.]

The Board of Aldermen of the city of Fort Smith, Ark., desiring to obtain a system of water-works, will grant a liberal franchise to a company willing to erect and operate the same. To that end propositions will be received up to the first Monday in February, 1884. For information address

418

ED. M. KENNA,
Chairman Committee on Water Works.

ELEVATOR.

[At Washington, D. C.]

OFFICE OF SUPERVISING ARCHITECT,
TREASURY DEPARTMENT,
WASHINGTON, D. C., December 12, 1883.

Sealed proposals will be received at this office until 12 M., on the 3d day of January, 1884, for furnishing and erecting complete, one hydraulic freight elevator for the cash room of the Treasury Department Building at Washington, D. C., in accordance with specification, copies of which and any additional information may be had on application at this office.

418

M. E. BELL, Supervising Architect.

STEAM-HEATING APPARATUS.

[At Mobile, Ala.]

OFFICE OF SUPERVISING ARCHITECT,
TREASURY DEPARTMENT,
WASHINGTON, D. C., December 13, 1883.

Sealed proposals will be received at this office until 12 M., on the 7th day of January, 1884, for supplying and fixing in place complete a low-pressure return-circulation steam-heating apparatus, in the custom-house building, at Mobile, Ala., in accordance with drawings and specification, copies of which and any additional information may be had on application at this office, or the office of the superintendent.

418

M. E. BELL, Supervising Architect.

ELEVATORS.

[At New York City.]

OFFICE OF SUPERVISING ARCHITECT,
TREASURY DEPARTMENT,
WASHINGTON, D. C., December 7, 1883.

Sealed proposals will be received at this office until 12 M., on the 21st day of December, 1883, for furnishing and erecting two steam freight-elevators, one in the Assay Office Building and the other in Public Stores Building, corner Laight and Washington Sts., New York City, in accordance with specification, copies of which and any additional information may be had on application at this office or the office of the Superintendent of Repairs at New York City.

417

M. E. BELL,
Supervising Architect.

GLASS.

[At Charleston, W. Va.]

OFFICE OF SUPERVISING ARCHITECT,
TREASURY DEPARTMENT,
WASHINGTON, D. C., December 11, 1883.

Sealed proposals will be received at this office until 12 M., on the 3d day of January, 1884, for furnishing and delivering ready for fixing in place, all the plate, double-thick sheet, double-thick sheet ground, and cathedral glass required for the post-office, court-house, etc., at Charleston, W. Va., in accordance with specification, schedule and diagrams, copies of which and any additional information may be had on application at this office or the office of the Superintendent.

417

M. E. BELL,
Supervising Architect.

IRON LIGHT-HOUSE FOUNDATION.

[At Fourteen-Foot Bank, Delaware Bay.]

OFFICE OF THE LIGHT-HOUSE BOARD,

WASHINGTON, D. C., December 13, 1883.

Sealed proposals will be received at this office until 2 P. M. of Thursday, the 27th day of December, 1883, for furnishing the materials and labor of all kinds necessary for the completion of the metal-work of the foundation cylinder for the Fourteen-Foot Bank Light-House, Delaware Bay.

Plans, specifications, forms of proposal, and other information may be obtained on application to this office.

The right is reserved to reject any or all bids, and to waive any defects.

418

STEPHEN C. ROWAN,
Vice Admiral U. S. Navy, Chairman.

IRON PIPE AND SPECIAL CASTINGS.

[At St. Paul, Minn.]

OFFICE OF THE BOARD OF WATER COMMISSIONERS,

ST. PAUL, MINN., December 12, 1883.

Sealed proposals will be received at the office of the Board of Water Commissioners of the City of St. Paul until 12 M., January 14, 1884, for furnishing said city with the following list of cast-iron water-pipe and special castings, in accordance with the plans and specifications on file in office of said Water Board:—

4.75 in. feet of 4-inch pipe, with privilege of 4,000 feet additional.

19.150 lin. feet of 6-inch pipe, with privilege of 6,000 feet additional.

8,900 lin. feet of 12-inch pipe, with privilege of 1,000 feet additional.

8,500 lin. feet of 16-inch pipe, with privilege of 1,000 feet additional.

Special castings, 35 tons, with privilege of enough to lay above pipe.

All pipe to be shipped by rail and delivered free on board of cars at St. Paul. Freight to be prepaid.

Pipe and specials to be delivered in such quantities as may be ordered, and within thirty days from date of order, and all to be delivered by October 1, 1884.

Payments will be made by monthly estimates, but no payments will be made before July 1, 1884.

A bond with at least two sureties, in a sum of at least 20 per cent of the gross amount bid, must accompany each bid.

The Board reserves the right to reject any and all bids.

Endorse on envelope, "Proposals for Cast-Iron Pipe and Specials."

419

JOHN CAULFIELD,
Secretary.